VOLUME 1 GENERAL INSPECTOR GUIDANCE AND INFORMATION

CHAPTER 1 HANDBOOK ORGANIZATION, USE, AND REVISION

Section 3 Acronyms and Abbreviations

1-46 GENERAL. Many acronyms and abbreviations for both old as well as new aviation terms are used throughout this handbook. Inspectors can refer to the following alphabetical listing of frequently used acronyms and abbreviations and their meanings when using this handbook.

Table 1-1. Acronyms and Abbreviations

AC	Advisory Circular
ACAT	Air Carrier Assessment Tool
ACARS	Aircraft Communications Addressing and Reporting System
ACDE	Air Carrier Designated Examiner
ACO	Aircraft Certification Office
AD	Airworthiness Directive
ADE	Aircrew Designated Examiner
ADF	Automatic Direction Finder
ADR	Advisory Route
ADS–B	Automatic Dependent Surveillance—Broadcast
AEG	Aircraft Evaluation Group
AEM	Area Equivalent Method
AES	Automated Exemption System
AFCGS	Automatic Flight Control Guidance System
A/FD	Airport/Facility Directory
AFE	Above Field Elevation
AFGS	Auto Flight Guidance System
AFM	Airplane Flight Manual
AFS-1	Director of Flight Standards Service
AFSS	Automated Flight Service Station
AFTN	Aeronautical Fixed Telecommunications Network
AGC	Office of the Chief Counsel
AGL	Above Ground Level
AH	Alert Height for Category III Operations
AIA	Office of International Aviation
AIM	Aeronautical Information Manual
AIP	Aeronautical Information Publication
AIRMET	Airmen’s Meteorological Information
ALPA	Air Line Pilots Association International
AMM	Aircraft Maintenance Manual
AOPA	Aircraft Owners and Pilots Association
APD	Aircrew Program Designee
APM	Aircrew Program Manager

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APU	Auxiliary Power Unit
AQP	Advanced Qualification Program
ARA	Airborne Radar Approach
ARFF	Aircraft Rescue and Fire Fighting
ARINC	Aeronautical Radio, Inc.
ASA	Aviation Safety Assistant
ASAP	Aviation Safety Action Program
ASDE	Airport Surface Detection Equipment
ASHP	Aviation Safety and Health Program
ASI	Aviation Safety Inspector
ASOS	Automated Surface Observing System
ASR	Airport Surveillance Radar
AST	Aviation Safety Technician
ATA	Air Transport Association of America
ATC	Air Traffic Control
ATCO	Air Taxi Commercial Operator
ATD	Aviation Training Device
ATIS	Automatic Terminal Information Service
ATOS	Air Transportation Oversight System
ATP	Airline Transport Pilot
ATS	Air Traffic Service
AVN	Aviation Standards National Field Office
AVS–1	Associate Administrator for Aviation Safety
AWOS	Automated Weather Observing System
AWTA	All Weather Terminal Area Operation
AXR–1	Executive Director for Standards and Compliance
AZI	Azimuth Instrument Approach
CAA	Civil Aeronautics Administration
CAB	Civil Aeronautics Board
CAD	Continuous ATOS Development
CAM	Civil Aeronautics Manual
CAMP	Continuous Airworthiness Maintenance Program
CAN	Center Area NOTAM
CAR	Civil Aviation Regulation
CBI	Computer-Based Instruction
CDL	Configuration Deviation List
CDTI	Cockpit Display of Traffic Information
CDU	Control Display Unit
CEP	Central East Pacific
CFI	Certificated Flight Instructor
CFM	Company Flight Manual
CFR	Code of Federal Regulations
CG	Center of Gravity
CHDO	Certificate-Holding District Office
CIG	Component Inoperative Guide

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CL	Centerline
CMO	Certificate Management Office
CMT	Certificate Management Team
CMU	Communications Management Unit
CPDLC	Controller-Pilot Data Link Communication
CPM	Certification Project Manager
CRAF	Civil Reserve Air Fleet
CRM	Crew Resource Management
CSET	Certification, Standardization, and Evaluation Team
CSI	Cabin Safety Inspector
CSP	Comprehensive Surveillance Plan
CTAF	Common Traffic Advisory Frequency
CVFP	Charted Visual Flight Procedures
DA	Density Altitude
DBA	Doing Business As
DEPM	Data Evaluation Program Manager
DFEE	Designated Flight Engineer Examiner
DGPS	Differential Global Positioning System
DH	Decision Height
DIS	Dynamic Information System
DME	Distance Measuring Equipment
DNL	Decibel Noise Level
DO	Director of Operations
DOD	Department of Defense
DOL	Department of Labor
DOR	Dynamic Observation Report
DOT	Department of Transportation
DPA	Decision Point Altitude
DPE	Designated Pilot Examiner
DR	Dead Reckoning
DUAT	Direct User Access Terminal
DWFAF	Downwind Final Approach Position
EA	Environmental Assessment
EAP	Employee Assistance Program
EASA	European Aviation Safety Agency
EFB	Electronic Flight Bag
EIR	Enforcement Investigation Report
EIS	Enforcement Information System
EIS	Environmental Impact Statement
EMS/A	Emergency Medical Services/Airplane
EPI	Element Performance Inspection
EPR	Exhaust Pressure Ratio
ERC	Event Review Committee
ER–OPS	Extended-Range Operations
ERT	Extended Review Team

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ETA	Estimated Time of Arrival
ETE	Estimated Time En Route
ETOPS	Extended Operations
EWINS	Enhanced Weather Information System
F/A	Flight Attendant
FA	Forecasts Area
FAA	Federal Aviation Administration
FA Act	Federal Aviation Act of 1958
FAF	Final Approach Fix
FAR	Federal Aviation Regulations
FBO	Fixed-Base Operator
FD	Flight Director
FDE	Fault Detection and Exclusion
FE	Flight Engineer
FIAO	Flight Inspection Area Office
FIFO	Flight Inspection Field Office
FIR	Flight Information Region
FL	Flight Level
FMF	Flight Movement Forecast
FMRB	Flight Manual Review Board
FMS	Flight Management System
FOD	Foreign Object Damage
FOEB	Flight Operations Evaluation Board
FOIA	Freedom of Information Act
FONSI	Finding of No Significant Impact
FOPB	Flight Operations Policy Board
FOPM	Flight Operations Policy Manual
FSAIC	Flight Standards Safety Analysis Information Center
FSAS	Flight Standards Automation System
FSAT	Flight Standards Information Bulletin for Air Transportation
FSB	Flight Standardization Board
FSDO	Flight Standards District Office
FSIB	Flight Standards Information Bulletin
FSIS	Flight Standards Information System
FSNFO	Flight Standards National Field Office
FSS	Flight Service Station
FT	Forecast Terminal
FTD	Flight Training Device
FTE	Flight Technical Error
GCNP-SFRA	Grand Canyon National Park-Special Flight Rules Area
GLS	GPS Landing System
GMM	General Maintenance Manual
GNSS	Global Navigation Satellite System
GOM	General Operations Manual
GPS	Global Positioning System

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GS	Groundspeed
GSGC	Ground School Graduation Certificate
GTD	Ground Training Device
HAA	Height Above Airport (nonprecision approach)
HAT	Height Above Touchdown (precision approach)
HAZMAT	Hazardous Materials
HBAT	Flight Standards Handbook Bulletin for Air Transportation
HEDA	Helicopter En Route Descent Area
HEMES	Helicopter Hospital Emergency Medical Evacuation Services
HF	High Frequency
HGS	Heads-Up-Guidance System
HIRL	High Intensity Runway Light
HMR	Hazardous Material Regulation
HQ	Headquarters
HUD	Head-Up Display
IAF	Initial Approach Fix
IAP	Instrument Approach Procedure
IAS	Indicated Airspeed
IATA	International Airport Transport Association
IAW	In Accordance With
ICA	Instructions for Continued Airworthiness
ICAO	International Civil Aviation Organization
IFO	International Field Office
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IM	Inner Marker
IMC	Instrument Meteorological Conditions
INM	Integrated Noise Model
INS	Inertial Navigation System
IOC	Initial Operating Capability
IOE	Initial Operating Experience
IRA	Instrument Rating Airplane
IRS	Inertial Reference System
IRU	Inertial Reference Units
ISARP	International Standard and Recommended Practice
ISIS	Integrated Safety Information Subsystem
JAD	Job Aid Disc
JTA	Job Task Analysis
Km	Kilometer
LAN	Local Area Network
LAWRS	Limited Aviation Weather Reporting Station
LDA	Localizer-Type Directional Aid
Lf	Low Frequency
LIRL	Low Intensity Runway Light
LLWS	Low-Level Wind Shear

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LNAV	Lateral Navigation
LOA	Letter of Authorization
LOE	Line Operational Evaluation
LOFT	Line-Oriented Flight Training
LOI	Letter of Investigation
LOP	Line of Position
LORAN	Long-Range Navigation
LOS	Line-Operational Simulation
LRA	Lowest Radar Altitude
MAP	Missed Approach Point
MCT	Maximum Continuous Thrust
MDA	Minimum Descent Altitude (nonprecision approach)
MDPR	Master Differences Program Requirement
MEL	Minimum Equipment List
MF	Medium Frequency
MHz	Megahertz
MID	Mid Runway Rollout
MIDO	Manufacturing Inspection District Office
MIRL	Medium Intensity Runway Light
MNPS	Minimum Navigation Performance Specification
MOU	Memorandum of Understanding
MRB	Maintenance Review Board
MSG	Maintenance Steering Group
MSL	Mean Sea Level
MTOW	Maximum Takeoff Weight
NADP	Noise Abatement Departure Profile
NAO	Noise Abatement Officer
NAS	National Airspace System
NASA	National Aeronautics and Space Administration
NAT	North Atlantic Track
NATA	National Air Transportation Association
NAT/OPS	North Atlantic Operation
NAVAID	Navigational Aid
NDB	Non-Directional Radio Beacon
NEPA	National Environmental Policy Act of 1969
NFDC	National Flight Data Center Office of the Asst. Secretary of Defense
NFDD	National Flight Data Digest
NM	Nautical Mile
NOAA	National Oceanic and Atmospheric Administration
NOPAC	North Pacific
NOS	National Ocean Service
NOTAM	Notice to Airmen
NPG	National Program Guidelines
NPRM	Notice of Proposed Rulemaking
NSPM	National Simulator Program Manager

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NST	National Standardization Team
NTSB	National Transportation Safety Board
NWS	National Weather Service
OAT	Outside Air Temperature
OC	Obstruction Chart
OCA	Obstacle Clearance Altitude
OCH	Obstacle Clearance Height
OCL	Obstacle Clearance Limit
ODS	Obstruction Data Sheet
OE	Operating Experience
OIG	DOT Office of the Inspector General
OJT	On the Job Training
OpSpecs	Operations Specifications
OPSS	Automated Operations Safety System
ORA	Operations Research Analyst
OSAP	Offshore Standard Approach Procedure
OSHA	Occupational Safety and Health Administration
OST	Office of the Secretary of Transportation
OTNA	Operational Training Needs Assessment
PAI	Principal Avionics Inspector
PANS–OPS	Procedures for Air Navigation Services Aircraft Operations
PAR	Precision Approach Radar
PASI	Preapplication Statement of Intent
PASS	Professional Airways Systems Specialist
PATCO	Professional Air Traffic Controllers Organization
PATWAS	Pilots Automatic Telephone Weather Answering Service
PCA	Positive Control Area
PCB	Production Certification Board
PF	Pilot Flying
PIC	Pilot in Command
PIREP	Pilot Weather Report
PKI	Public Key Infrastructure
PMI	Principal Maintenance Inspector
PMMEL	Proposed Master Minimum Equipment List
PNF	Pilot-Not-Flying
POI	Principal Operations Inspector
POM	Pilot Operating Manual
PPM	Partial Program Manager
PRD	Planned Redispatch
PRIA	Pilot Records Improvement Act of 1996
PRM	Precision Runway Monitor
PRR	Planned Rerelease
PSI	Principal Security Inspector
PTRS	Program Tracking and Reporting Subsystem
PTS	Practical Test Standards

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QICP	Qualified Internet Communications Provider
RAA	Regional Airline Association
RAIM	Receiver Autonomous Integrity Monitoring
RCH	Runway Crossing Height
RCLM	Runway Centerline Marking
RFM	Rotorcraft Flight Manual
RFSD	Regional Flight Standards Division
RFT	Recurrent Flight Training
RMA	Radar Minimum Altitude
RNAV	Area Navigation
RNP	Required Navigation Performance
ROC	Regional Operations Center
RSI	Remotely Sited Geographic Aviation Safety Inspector
RTCA	Radio Technical Commission for Aeronautics
RVO	Runway Visibility by Observer
RVR	Runway Visual Range
RVSM	Reduced Vertical Separation Minimum
RVV	Runway Visibility Value
RWBC	Regional Whistleblower Coordinator
SA	Selective Availability
SAFE	Aviation Safety Analysis and Functional Evaluation
SAI	Safety Attribute Inspection
SARA	Special Airport/Route Authorization
SAT	System Analysis Team
SATCOM	Satellite Communications
SAWRS	Supplementary Aviation Weather Reporting Station
SDE	School Designate Examiner
SEC	Special Enforcement Consideration
SEIFR	Single Engine Instrument Flight Rules
SFAR	Special Federal Aviation Regulations
SIAP	Standard Instrument Approach Procedure
SIC	Second-in-Command
SID	Standard Instrument Departure
SIGMET	Significant Meteorological Information
SIM	Flight Simulator
SIP	Surveillance Improvement Process
SLRCS	Single Long-Range Communication System
S-LRNS	Single Long-Range Navigation System
Sm	Statute Mile
SMGCS	Surface Movement Guidance and Control System
SOE	Supervised Operating Experience
SPAS	Safety Performance Analysis System
SPO	Supporting Proficiency Objectives
SPOT	Special Purpose Operational Training
SRR	Specific Regulatory Requirement

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STAR	Standard Terminal Arrival Route
STC	Supplemental Type Certificate (or Certification)
STOL	Short Takeoff and Landing
SVT	Single-Visit Training
SYSOP	Systems Operator
TACAN	Tactical Air Navigational Aid
TAS	True Airspeed
TBD	To Be Developed
TC	Type Certificate
TC	Team Coordinator
TCAS	Traffic Alert and Collision Avoidance System
TCDS	Type Certificate Data Sheet
TCE	Training Center Evaluator
TCH	Threshold Crossing Height
TCO	Training Course Outline
TCPM	Training Center Program Manager
TDZ	Touchdown Zone
TERPS	Terminal Instrument Procedures
TLS	Transponder Landing System
TPO	Terminal Proficiency Objectives
TSA	Transportation Security Administration
TSO	Technical Standard Order
TWEB	Transcribed Weather Broadcast
UHF	Ultrahigh Frequency
UNICOM	Aeronautical Advisory Station
U.S.C.	United States Code
USNOF	United States NOTAM Office
UTC	Universal Coordinated Time
VASI	Visual Approach Slope Indicator
VERTOL	Vertical Takeoff and Landing
VFR	Visual Flight Rules
VHF	Very High Frequency
VIS	Vital Information Subsystem
VLF	Very Low Frequency
VMC	Visual Meteorological Conditions
VNAV	Vertical Navigation
VOR	Very High Frequency Omnidirectional Range
VOR/DME	Very High Frequency Omnidirectional Range/Distance Measuring Equipment
VORTAC	VHF Omnidirectional Range Station/Tactical Air Navigation
VPN	Virtual Private Network
VSI	Vertical Speed Indicator
WAAS	Wide Area Augmentation System
WBPP	Whistleblower Protection Program

RESERVED. Paragraphs 1-47 through 1-60.

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VOLUME 2 AIR OPERATOR AND AGENCY CERTIFICATION AND APPLICATION PROCESS

CHAPTER 2 GENERAL INFORMATION FOR AIR CARRIER CERTIFICATION AND FRACTIONAL OWNERSHIP APPLICATION

Section 3 Hazardous Materials or Dangerous Goods

2-246 BACKGROUND.

A. Objective. This section provides guidance concerning Title 49 of the Code of Federal Regulations (49 CFR) on hazardous materials (hazmat) transportation. Principal inspectors (PI) should ensure that air agencies/carriers are aware of the 49 CFR regulations governing hazmat transportation by air. These regulations apply to the certificate holder's shipment of hazmat. Air agencies/carriers should be aware that, as a hazmat employer, their compliance with the hazmat employee training requirements contained in 49 CFR part 172 subpart H is mandatory. The definitions of "hazmat employer" and "hazmat employee" can be found in 49 CFR part 171, § 171.8. Also, the certificate holders must develop and implement a system that will allow the air agency/carrier to remain current with the regulations that are updated and/or changed.

B. Hazmat Employee Training Requirements. Title 14 of the Code of Federal Regulations (14 CFR) part 145 repair stations located inside and outside the United States must meet the requirements of 14 CFR part 145, §§ 145.53 and 145.57 regarding certifying the training of their hazmat employees. This is accomplished by issuing a letter to the Federal Aviation Administration (FAA) certifying that all their hazmat employees, contractors, and subcontractors have been trained in accordance with 49 CFR part 172 subpart H, or as outlined in the most current edition of the International Civil Aviation Organization (ICAO) Doc 9284, Technical Instructions for the Safe Transport of Dangerous Goods by Air, as applicable. All certificate management offices (CMO)/Flight Standards District Offices (FSDO) and International Field Offices (IFO) will accept, without further showing, the letter certifying that the appropriate employees are trained.

C. Hazmat Recognition Program. Operators that choose not to carry hazmat must have a hazmat recognition program. (Refer to 14 CFR part 121 subpart Z; part 121 appendix O; part 135 subpart K; and paragraph 2-248 of this section.).

2-247 RESPONSIBILITY FOR ACCEPTANCE/APPROVAL, SURVEILLANCE, AND ENFORCEMENT OF HAZMAT PROGRAMS. The Office of Security and Hazardous Materials Safety (ASH), through the regional Hazardous Materials Branch Managers (HMBM), has oversight responsibility for an air carrier's hazmat program. The HMBM is the technical expert and must evaluate all hazmat programs (See Volume 3, Chapter 51, Section 7.). An operator's hazmat program is contained in its hazmat manual and includes hazmat training.

A. Certificate Responsibilities. PIs with certificate responsibilities for air agencies (part 145), and PIs with certificate responsibilities for air carriers (parts 121 and 135) that use aircraft components or consumable materials that contain hazmats should ensure that air agencies/carriers include in their manuals, and provide appropriate personnel training on, the following information:

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- Procedures and information to assist personnel (particularly maintenance, shipping, and storage personnel) to identify or recognize aircraft components and consumable materials that contain hazmat;
- Procedures and information on how these aircraft components or consumable materials are to be moved, stored, or handled within the facilities of the air agency, air carrier, or other air agency with whom they may be contractors;
- Procedures and information for determining the proper packaging, marking, labeling, and materials compatibility, including instructions for the safe movement, storage, and handling of aircraft components and consumable materials that contain hazmats while they are within their facilities, including such materials as chemical oxygen generators;
- Information, guidance, and precautions on the specific hazards associated with aircraft components and consumable materials containing hazmat that are to be moved, stored, or handled within their facilities; and
- Information, instructions, and detailed procedures for the proper disposal of unserviceable aircraft components and consumable materials containing hazmat.

B. Procedures for Acceptance of Hazmat Training. When a principal operations inspector (POI) receives proposed or updated hazmat training from an operator, the POI should forward it to the HMBM. The HMBM evaluates the contents of the training and consults with the POI when necessary. The operator should coordinate with the HMBM as necessary to formulate satisfactory hazmat training. Once the HMBM is satisfied with the training, the HMBM will recommend it to the POI in writing for final acceptance. The POI then accepts the implementation of the training in accordance with part 121 subpart Z or part 135 subpart K. Hazmat training is usually included in the air carrier's hazmat manual. The initial acceptance of the training is usually done at the same time as the review and acceptance of the hazmat manual.

C. Procedures for Acceptance of Hazmat Manuals. Like other manuals, the hazmat manual is required by part 121, § 121.135 and part 135, § 135.23 and must be accepted by the POI. However, POIs must not accept this manual until the HMBM has evaluated it and recommended it for acceptance. When a POI receives a hazmat manual for review from an air carrier, the POI should forward it to the HMBM. The HMBM will review the contents of the manual and consult with the POI when necessary. The operator should coordinate with the HMBM as necessary to formulate a satisfactory hazmat manual. Once the HMBM is satisfied with the manual, the HMBM will recommend it to the POI in writing for acceptance. Only then may the POI accept the manual.

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2-248 HAZMAT INFORMATION REQUIREMENTS FOR OPERATORS NOT ACCEPTING HAZMAT. Operators who do not accept, handle, or store hazmat must provide procedures and instructions in the operator's manual as follows:

- Procedures and instructions so that all personnel responsible for accepting and handling any cargo or packaged materials receive adequate training on the recognition of items classified as hazmat (adequate is defined in an operational sense to mean the demonstrated ability of required personnel to identify such items);
- Procedures and instructions so that no packages are accepted by the operator that contain a hazmat;
- Procedures and instructions for reporting that damaged packages found to contain, or that are suspected of containing, hazmat or dangerous goods are reported in compliance with 49 CFR §§ 171.15, 171.16, and 49 CFR part 175, § 175.31;
- Procedures and instructions to see that all Company Material (COMAT) containing hazmat will be offered to a different mode of transportation (e.g., ground) and/or an air carrier that is authorized to transport hazmat; and
- Procedures and instructions to see that any employee, agent, or contract employee of the air carrier who prepares and/or offers COMAT containing hazmat for shipment via any mode is fully trained as a hazmat shipper.

2-249 HAZMAT INFORMATION REQUIREMENTS FOR OPERATORS ACCEPTING HAZMAT. Operators who transport hazmat must provide instruction and procedures on the following basic subjects. The following information is background material for the aviation safety inspector (ASI) and does not supplant or provide guidance for an operator's hazmat program. POIs may share this information when requested, but must see that the operator understands that the HMBM is the FAA authority that the operator must work with when developing, implementing, or changing a hazmat program.

NOTE: See Table 2-6, Applicable Regulatory References, for a list of applicable regulatory references.

A. Procedures and Instructions on Acceptance of Hazmat for Air Shipment. The operator's instructions should contain the following information:

1) The operator must properly package, mark, label, and document the material in accordance with the packaging rules. The total quantity must be within the quantity limitations, and the proper shipping papers, Department of Transportation (DOT) special permits, or competent authority acceptances must accompany the shipment, as determined by the inspection requirements for accepting shipments in 49 CFR part 175.

2) The package may not leak or be damaged, and must be an authorized package in accordance with the applicable regulations.

3) The package must either be authorized for carriage in passenger-carrying aircraft or labeled for cargo-only aircraft if it is not acceptable for passenger-carrying aircraft.

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4) The material must be identified by the proper shipping name, hazard class or division, identification number, and packing group, when required, in accordance with 49 CFR part 172, or the ICAO Technical Instructions.

5) The package must be properly marked and labeled in accordance with 49 CFR or the ICAO Technical Instructions.

6) The operator must review shipping papers to ensure that they entered all necessary information, including any additional information that may be required because of the commodity shipped, or because the method of transportation is related to air transportation.

B. Storage of Hazmat. Operators should provide specific guidance on the storage of hazmat. This guidance should include instructions for Class 8 (corrosive), Class 7 (radioactive), and Class 6, Division 6.1 (poisonous) materials as discussed below:

1) The storage of corrosive materials next to, or in contact with, Class 4, Division 4.2 or 4.3 (flammable) solids or Class 5, Division 5.1 (oxidizing) materials must be prevented. The segregation prescribed in 49 CFR § 175.78 must be maintained for all packages containing hazmat that might react dangerously when stored in a position that causes or contributes to leakage.

2) The storage of radioactive materials labeled “yellow II” and/or “yellow III” will not exceed a transport index (TI) of 50 in a single storage location. These materials are stored in an area that is isolated from people and does not permit pedestrian traffic or loitering. The minimum separation distances prescribed in 49 CFR § 175.703 should be maintained between radioactive materials labeled “yellow II” and “yellow III” and packages of undeveloped film.

3) Packages bearing a poison label will not be stored in the same location as foodstuffs, feeds, or any edible materials intended for consumption by either humans or animals.

C. Loading of Hazmat. The operator should provide specific guidance for loading hazmat. This guidance should include:

- Loading of hazmat in aircraft in accordance with 49 CFR part 175 subpart B;
- Loading and carriage of hazmat in cargo-only aircraft, when other means of transportation are not available or impracticable, in accordance with 49 CFR § 175.310, as revised;
- Loading of radioactive materials in aircraft in accordance with 49 CFR § 175.700 to ensure that TI limitations are in accordance with the provision of 49 CFR § 175.75 and that the operator transports radioactive packages in accordance with 49 CFR §§ 175.701, 175.702, and 175.703;
- Loading of hazmat in cargo compartments or freight containers within cargo compartments, in accordance with 49 CFR § 175.75; and
- A prohibition against loading packages bearing a poison label in the same compartment that holds foodstuffs, feeds, or any edible materials intended for consumption by humans or animals unless both commodities are in separate, closed-unit load devices known as freight containers.

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D. Written Notification of Pilot in Command (PIC). Operators must establish procedures for notifying the pilot in command (PIC) when they are carrying hazmat onboard the aircraft in accordance with 49 CFR § 175.33.

E. Reporting Hazmat Incidents. The hazmat information must include company procedures for reporting hazmat incidents, in compliance with 49 CFR §§ 171.15 and 171.16, and should include the procedures for reporting discrepancies, in compliance with 49 CFR § 175.31.

F. Damage to Hazmat Packages. The operator must develop procedures for handling damaged packages in accordance with 49 CFR § 175.90, radioactive contamination in accordance with 49 CFR § 175.705, and substances in Class 6, Division 6.2 (infectious substances), as found in 49 CFR § 175.630. The information should include a list of telephone numbers and addresses of organizations who can provide technical advice on cleanup techniques and precautions to minimize the possibility of injury to employees and the general public. Appropriate organizations for such advice include the following:

- CHEMTREC;
- U.S. Department of Energy (DOE);
- A State public health department;
- A Federal or State office of hazmat regulation; and
- The Center for Disease Control and Prevention (CDC) of the U.S. Department of Health and Human Services (HHS).

2-250 COORDINATION. The POI may be required to act as a coordinator between the operator and the appropriate region's security and hazmat division. HMBMs may be contacted regarding all aspects of the air transportation of hazmat.

2-251 SPECIAL PERMITS. When an operator applies for either an initial DOT special permit or the renewal of a special permit for the carriage of certain hazmat in air commerce, the PIs may need to assist the region's security and hazmat division in reviewing the compliance history of the certificated operator. There are two types of DOT special permits: a special permit that is valid for two years and is obtained through the DOT standard special permit process, and an emergency special permit that is issued to the shipper who hires and provides the name of the air operator in the special permit. The emergency special permit is issued exclusively for one-time-only shipments.

2-252 VIOLATIONS AND INVESTIGATIONS. When an inspector becomes aware of a suspected hazmat violation, the inspector shall notify the appropriate HMBM and the appropriate POI. The hazmat special agents conduct inspections, surveillance, and investigations of the transportation of hazmat in air commerce operations.

2-253 SOURCES OF INFORMATION. The following regulations and publications pertaining to the safe transportation of hazmat are available electronically:

A. National Sources. National sources of information pertaining to the safe transportation of hazmat are as follows:

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1) Title 14 CFR parts 91, 91 subpart K (part 91K), 121, 125, and 135 are applicable to air carrier, air taxi operations, and helicopter operations, and define the duties and responsibilities for conducting training programs and procedural manuals dealing with the air transportation of hazmat.

2) Title 49 CFR parts 100 through 185 deal with the proper identification, classification, packaging, labeling, marking, and certification of hazmat transported in commerce.

3) DOT Hazmat Web site: http://phmsa.dot.gov/hazmat.

4) FAA Hazmat Web site: http://www.faa.gov/about/office_org/headquarters_offices/ash/ash_programs/hazmat/.

5) ASH contact information: http://www.faa.gov/about/office_org/headquarters_offices/ash/ash_offices/index.cfm.

B. ICAO Doc 9284, Technical Instructions for the Safe Transport of Dangerous Goods by Air. These technical instructions amplify the basic provisions of Annex 18 to the Convention on International Civil Aviation, and contain detailed instructions necessary for the safe international transport of dangerous goods by air. These instructions are issued in a two-year edition on alternate Septembers, becoming effective the following January 1.

2-254 AMENDING AN AIR CARRIER'S MANUAL. Title 14 CFR part 119, § 119.59 contains the FAA's authority for inspecting an air carrier or conducting routine surveillance to ensure compliance with the air carrier's manual requirements. Sections 121.131, 121.133(a), 121.135(b)(25), 135.21, and 135.23(p)(1), as appropriate, contain FAA authority for an air carrier manual change.

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Table 2-6. Applicable Regulatory References

SUBJECTS	REGULATORY REFERENCES
*‡ Hazardous Materials and Classifications	49 CFR parts 171 and 172
‡ Shipping Paper and Certification Requirements	49 CFR part 172
*‡ Packaging, Marking, and Labeling	49 CFR parts 171, 172, 173, 175, and 178
* Exceptions to the Regulations	49 CFR § 175.10
Written Notification of PIC	49 CFR § 175.33
* Reporting Hazardous Materials Incidents/Discrepancies	49 CFR § 171.15 49 CFR § 171.16 49 CFR § 175.31
Loading, Unloading, and Handling	49 CFR part 175 subpart B
Specific Regulations Applicable According to Classification of Material	49 CFR part 175 subpart C
Continuing Qualification and Maintenance of Packagings	49 CFR part 180
Hazardous Materials Training Program	14 CFR part 121 subpart Z
Hazardous Materials Training Requirements for Certificate Holders	14 CFR part 121 Appendix O
Hazardous Materials Training Program	14 CFR part 135 subpart K

NOTE: * Operators who will not accept or transport hazmats or dangerous goods only have to train in these subjects.

NOTE: ‡ In accordance with 49 CFR part 171 subpart C, the ICAO Technical Instructions can be used.

RESERVED. Paragraphs 2-255 through 2-270.

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VOLUME 2 AIR OPERATOR AND AIR AGENCY CERTIFICATION AND APPLICATION PROCESS

CHAPTER 11 CERTIFICATION OF A TITLE 14 CFR PART 145 REPAIR STATION

Section 3 International Field Office Procedures for Certificating/Renewing/Amending a Part 145 Repair Station Located Outside the United States and its Territories and not Under a Maintenance Implementation Procedure

2-1241 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.

A. Maintenance: 3230, 3376, 3650 Renewing/Amending.

B. Avionics: 5230, 5376, 5650 Renewing/Amending.

2-1242 OBJECTIVE. This section provides guidance for evaluating an applicant for certification/renewal/amendment of a Title 14 of the Code of Federal Regulations (14 CFR) part 145 repair station located outside the United States in a country without a Bilateral Aviation Safety Agreement (BASA) with Maintenance Implementation Procedures (MIP) with the United States.

NOTE: Readers of this section may use the terms “applicants,” “repair stations,” or “facilities” when referring to repair station applicants from part 145 facilities located outside the United States.

2-1243 INTRODUCTION.

A. General. This section provides required procedures for International Field Offices (IFO) when they certificate, or perform surveillance for, part 145 repair stations located outside the United States. Each aviation safety inspector (ASI) assigned to an IFO must be conscious of sensitive issues associated with working in the international environment. Inspectors must conduct themselves with the highest degree of professionalism while assigned outside the United States. An inspector must be courteous and respectful when dealing with foreign nationals and the various officials of the foreign aviation authorities (AA). Inspectors should understand that, while working for the Federal Aviation Administration (FAA), every action is representative of the U.S. Government. The FAA expects IFO employees to be fully aware that they are guests in a foreign country and they should recognize national culture within their working environment. The FAA expects IFO inspectors to observe the above guidance during all phases of the certification/renewal/amendment process.

B. Topics. This section covers:

- Introductory material, such as general descriptions of the five-phase certification/renewal/amendment process, new requirements for satellite repair stations, and special situations and provisions unique to IFOs;
- Initial certification procedures;

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- Certificate renewal procedures; and
- Certificate amendment procedures and geographic authorizations.

C. Initial Certification of Foreign Repair Stations.

1) Background.

a) Approval of Legislation and Updates to Regulations. On December 12, 2003, Public Law (PL) 108-176, Vision 100—Century of Aviation Reauthorization Act, was signed into law. It was amended on August 3, 2007 by PL 110-53, Implementing Recommendations of the 9/11 Commission Act of 2007. As a result, Section 1616 of PL 110-53 updated Title 49 of the United States Code (49 U.S.C.) § 44924.

b) Suspension of Certificating Foreign Repair Stations. PL 110-53 required that final regulations for repair stations be issued no later than August 2008, and required the Transportation Security Administration (TSA) to complete audits of foreign repair stations within 6 months after publication of Title 49 of the Code of Federal Regulations (49 CFR) part 1554. The final regulations were not issued by the August 2008 deadline, and consequently the FAA Administrator was barred from certificating additional foreign repair stations.

c) Resuming Certification of Foreign Repair Stations. Due to the publication of 49 CFR part 1554, the FAA may now certificate new foreign repair station applicants. The FAA will notify the TSA when an FAA part 145 certification has concluded and an Air Agency Certificate is issued.

d) Updates to FAA Order 8900.1. This section establishes procedures to facilitate FAA–TSA communication and coordination to ensure the TSA remains informed of foreign repair station applications early in the certification process. By using a five-phase certification process, the FAA can inform foreign repair station applicants of TSA interface.

2) Action.

a) Coordination. During the certification process, the ASI will coordinate with the FAA manager (or delegate), team members, and the applicant to ensure that the appropriate management personnel are available during the inspection in order to manage FAA resources.

b) Communicating the TSA’s Role with the Applicant. The FAA manager (or delegate) informs the applicant that the TSA has no role in the certification process and that the TSA will work directly with the applicant to arrange the security audit.

c) Communication During the Certification Process. The FAA may share an applicant’s certification status with the TSA.

d) Completion of the Demonstration Phase. ASIs must follow the certification process in this section when the applicant meets all regulatory requirements.

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e) Upon completion of the FAA's certification phase, the FAA manager (or delegate) will inform the TSA when an FAA Part 145 Certification and Air Agency Certificate has been issued. The email addresses listed below may be used as points of contact for FAA notifications:

- For repair stations located within the United States: ARS@tsa.dhs.gov.
- For repair stations located outside the United States: FRS@tsa.dhs.gov.

2-1244 THE CERTIFICATION/RENEWAL/AMENDMENT PROCESS.

A. General. This process details interaction between the applicant and the FAA from the initial inquiry to either certificate issuance or denial of the repair station application. Using these procedures, the ASI can thoroughly review, evaluate, and test programs, systems, and intended methods of compliance. The certification/renewal/amendment process has five phases:

- Preapplication,
- Formal application,
- Document compliance,
- Demonstration and inspection, and
- Certification.

B. Preapplication Phase:

1) Preapplication Meeting. The inspector should hold the preapplication meeting at the IFO, enabling the applicant to meet members of the assigned FAA certification team, and identifying a point of contact (POC) from the applicant's facility. The certification team and applicant should openly discuss the applicant's intent. The FAA should answer any questions the applicant may have regarding the process. During the preapplication meeting, the FAA and applicant should discuss:

a) The applicant's submittal of FAA Form 8400-6, Preapplication Statement of Intent, showing its intent to initiate the certification process.

1. An applicant should thoroughly review the appropriate regulations and advisory material. This will allow the applicant to become acquainted with the personnel, facility, equipment, and documentation requirements. After this review, the applicant must address how these requirements will be met when completing the Preapplication Statement of Intent (PASI).

2. The inspector must advise the applicant that a fee is associated with all certification activities, per 14 CFR part 187. The fee includes charges for inspectors' travel, hotels, meals, all transportation, time, and any administrative time required to complete the certification process.

NOTE: The inspector should advise the applicant that the FAA charges for its services outside the United States, and that additional charges may apply after certification for activities, such as FAA surveillance. The inspector should advise

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the applicant to review and understand the current edition of Advisory Circular (AC) 187-1, Flight Standards Service Schedule of Charges Outside the United States.

3. The IFO manager, or the authorized designee, must evaluate the complexity of the proposed operation. This evaluation enables the certification team's establishment to be based on the complexity of the certification. The IFO manager will designate a principal inspector (PI) as the principal spokesperson for the FAA during the certification process.

NOTE: Advise the applicant that, when submitting the application, the applicant must be prepared to provide the FAA with documentation demonstrating that the repair station certificate or rating is necessary for maintaining U.S.-registered or U.S.-operated foreign aircraft or components as required by part 145, § 145.51(c).

b) Instructions to the applicant on how to complete FAA Form 8310-3, Application for Repair Station Certificate and/or Rating.

c) Formal application attachments, including:

1. The Repair Station Manual (RSM). This manual will establish how a certificated repair station (CRS) will conduct business on a daily basis and comply with §§ 145.207 and 145.209.

2. The Quality Control Manual (QCM). This manual will ensure that any article(s) repaired or maintained by a repair station or its contractors will meet the regulatory criteria established in § 145.211. The applicant may incorporate the QCM into the RSM as a separate section.

NOTE: The QCM may be a section of the RSM, a separate manual, or a combination of the two, depending on the manual's structure. The ASI must stress that all requirements listed in §§ 145.209 and 145.211 must be located in the manual(s) and easily identified.

3. Letter of compliance. This is only required during initial certification. It will ensure that the applicant addresses all applicable regulatory requirements during the certification process. The applicant accomplishes this by listing, in sequence, each section of part 145. After each section, the applicant must include a brief narrative or specific reference to a manual/document that describes how it will comply with that regulation. Review the letter of compliance to ensure that the applicant has a clear understanding of the regulation and that the proposed method of compliance meets the intent of the regulation.

4. Documentation for certificate. The requirements for the certificate, rating, and demonstration documentation are described in § 145.51(c).

5. Hazardous materials (hazmat) standards.

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a. As of November 7, 2005, if the repair station and/or its contractors and subcontractors are performing a job function concerning transportation of dangerous goods (hazmat), the repair station must train its employees to the hazmat standards. The repair station must also provide the FAA with a letter certifying that the appropriate employees have been trained as outlined in the current edition of the International Civil Aviation Organization (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air. The IFO must retain this letter with the certification report and file. This letter is only required at the time of initial certification or anytime the repair station applies for a certificate change as defined in § 145.57, unless the letter is already in the repair station certification file.

b. The PI, at the time of application, will notify the repair station applicant that the repair station must address the requirements of § 145.53. The PI should review the letter of compliance to ensure the applicant has addressed the requirements of §§ 145.53 and 145.57. The FAA must have the certifying letter on file. However, the burden of surveillance and qualifications of hazmat requirements falls on other organizations within and outside the FAA. Example organizations include the FAA Office of Security and Hazardous Materials Safety (ASH) and/or the U.S. Department of Transportation (DOT). All IFOs will accept, without further showing, the letter certifying that the appropriate employees have been trained.

d) Refer the applicant to the current edition of AC 145-9, Guide for Developing and Evaluating Repair Station and Quality Control Manuals, for written guidance in developing the manuals. The manual should enable the user to understand its content without further explanation and must not contradict any regulatory requirements.

NOTE: The applicant must develop manuals and procedures that ensure safe operating practices and compliance with the rules. The certification team can offer suggestions for improvement but must not write the material. Procedures must reflect the way each repair station conducts its business.

e) Refer the applicant to the current edition of AC 145-10, Repair Station Training Program. It is the applicant's responsibility to develop manuals and procedures that ensure safe operating practices and compliance with the rules.

2) Personnel Requirements. Per § 145.151, each repair station must have the management personnel necessary for the scope and complexity of its organization. The regulation requires an accountable manager, supervisory personnel, and inspection personnel. The repair station may need other (nonregulatory) management or supervisory personnel to support its quality system and provide a sufficient number of trained and knowledgeable employees, as required by § 145.151.

a) The repair station must determine the abilities of its noncertificated employees who perform maintenance functions based on their training, knowledge, experience, or practical testing. Normally the FAA will consider personnel certification issued by the aviation authority (AA) where the repair station will be located. However, the FAA reserves the right to conduct individual interviews during the inspection to determine employee qualifications.

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b) Qualifications for supervisory and inspection personnel and those personnel authorized to approve an article for return to service must meet the English language requirements of § 145.157(b) and (c). These personnel must be able to understand, read, and write English. Again, the FAA will normally consider personnel certification issued by the AA where the repair station will be located. However, the FAA reserves the right to conduct individual interviews during the inspection to determine employee qualifications.

C. Formal Application Phase. The formal application phase begins when the team receives the application and attachments. As a rule, the team will meet with the applicant after receiving the formal application package. The team and the applicant should now resolve all questions about the proposed operation, formal application, and attachments. The certification team members and all key management personnel from the applicant's organization should attend the meeting. The owner should determine the legal name of the repair station and the address of its location at this point of certification.

D. Document Compliance Phase. The team thoroughly reviews the application for approval or disapproval. The team reviews the RSMs and related attachments to ensure conformity to the applicable regulations and safe operating practices. The certification team completes this phase in the IFO.

E. Demonstration and Inspection Phase. The certification team ensures that the applicant's proposed procedures are effective and that facilities and equipment meet regulatory requirements. The PI must decide if demonstrations will be required.

F. Certification Phase.

1) Certificate Issuance. When the applicant meets the regulatory requirements of part 145 and has paid the appropriate fees, the certification team will issue the repair station certificate and operations specifications (OpSpecs) with the appropriate ratings. Upon completion of the FAA's certification phase, the FAA manager (or delegate) will inform the TSA when an FAA Part 145 Certification and Air Agency Certificate has been issued. The email addresses listed below may be used as points of contact for FAA notifications:

- For repair stations located within the United States: ARS@tsa.dhs.gov.
- For repair stations located outside of the United States: FRS@tsa.dhs.gov.

NOTE: U.S. repair stations located outside the United States are only given limited ratings. The Administrator or the Administrator's designee must make this certification in accordance with implementation procedures signed.

2) Certificate Duration. Certificates for repair stations located outside the United States have a limited duration. Initial certification is limited to 12 months from the date the certificate is issued. Thereafter, the FAA will renew the certificate or rating for a 24-month period if the repair station has operated in compliance with the applicable requirements of part 145 within the preceding period.

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2-1245 SATELLITE REPAIR STATIONS.

A. CRS Under the Managerial Control of Another CRS. A CRS under the managerial control of another CRS may operate as a satellite repair station if it meets all the requirements of § 145.107.

NOTE: A satellite repair station must be in the domicile country of the CRS with managerial control. This does not include the claimed territories of a country located outside the geographic boundaries of that country.

1) The inspector will advise the Aviation Data Systems Branch (AFS-620) that a satellite repair station certificate number is desired. The inspector should advise the applicant that the satellite repair station certificate number will differ slightly from the managerial station's certification number.

2) Each satellite repair station is considered a standalone operation and must meet all of the requirements of § 145.107. The repair station will complete certification and surveillance per normal procedures, with the regionally assigned IFO having jurisdiction over that facility.

B. Personnel Interchange. A repair station may interchange personnel anywhere in its system, as long as:

1) Personnel are identified on each repair station roster.

2) The qualified personnel are listed on the roster for the repair station with managerial control and the satellite facility.

3) Inspection personnel are designated and available at the satellite station when a determination of airworthiness or return to service is made.

NOTE: Many corporations with multiple satellite repair stations are consolidating their operations, quality control (QC) systems, manuals, and recordkeeping systems. PIs must coordinate their certification and surveillance functions when notified that the CRS with managerial control and its satellite facilities desire standardized systems.

2-1246 AMENDMENT TO OR TRANSFER OF CERTIFICATE.

A. New Application. Section 145.57 requires that a repair station submit a new application in the following situations:

1) The holder of a repair station certificate must apply for a change to its certificate if it changes the location of the repair station, or requests adding or amending a rating. The repair station certificate holder must notify the FAA in advance and the FAA may prescribe conditions that the repair station must follow when moving to a new address or location.

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2) If the holder of the repair station certificate sells or transfers its assets, the new owner must apply for an amended certificate in accordance with § 145.51. On occasion, repair station ownership changes without changing the facilities and personnel. An example of this type of change would be a stock transfer or a monetary takeover that does not change or affect the location, tools, equipment, or management personnel.

NOTE: ASIs should contact their regional general counsel office when asked questions concerning whether limited liability corporations or changes in stockholder ownership constitute a transfer of repair station assets.

3) If the repair station and/or its contractors or subcontractors are performing a job function concerning transportation of hazmats, the repair station must train its employees to the ICAO's hazmat standards. The repair station must also provide the FAA with a letter certifying that the appropriate employees have been trained to the ICAO standard, as described in subparagraph 2-1244B1)c)*5*, unless the letter is already in the repair station certification file.

B. Certificate Number. The inspector should recommend a new certificate number, due to the Freedom of Information Act (FOIA) and liability issues. ASIs should inform prospective owners that they might be held liable for work performed under previous management. To retain the old number, new owners must stipulate in writing that they clearly understand the potential for release of information under the FOIA when retaining the old certificate number.

2-1247 SPECIAL PROVISIONS FOR REPAIR STATIONS LOCATED OUTSIDE THE UNITED STATES. The FAA, AA, and industry should be aware of the following special provisions and situations:

A. Geographic Authorization. A geographic authorization is an approval provided to an airframe-rated facility to perform maintenance under contract for a U.S. air carrier or for an operator of U.S.-registered aircraft under 14 CFR part 129 at a location other than the facility. The FAA issues a geographic authorization to respond to the maintenance needs of a U.S. air carrier, or of part 129 operators, at a station where the frequency and scope of that maintenance does not warrant permanently staffing and equipping the station for that maintenance.

B. Perceived Need. Section 145.51(c)(1) requires that the applicant show the necessity for a certificate. The necessity is considered a perceived need. The applicant must have a current or future operational or economic need (a perceived need) for the maintenance, preventive maintenance, or alteration of aeronautical articles subject to the FAA's regulatory oversight. The applicant must demonstrate that a certificate is necessary. See subparagraph 2-1250E4)e) for a detailed description of the perceived need requirements.

C. Certificate Renewal. Certificates for repair stations located outside the United States have a limited duration. Initial certification is limited to 12 months from the date the certificate is issued. Thereafter, the FAA will renew the certificate or rating for a 24-month period if the repair station has operated per the applicable requirements of part 145 within the preceding period.

D. National Certification. FAA policy requires the FAA to advise the country's AA of FAA certification. The FAA need not obtain AA concurrence, but the FAA will take under consideration any safety information related to the applicant. Section 145.53(a) states, in part,

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"A person who meets the requirements of this part is entitled to a repair station certificate." The FAA will request a copy of the applicant's Air Agency Certificate and limitations document. Some countries might not issue repair station certification, and in such instances, part 145 enables the FAA to issue a certificate.

E. Personnel Certification. The personnel certification requirements of 14 CFR part 65 do not apply to supervisors or inspectors in repair stations located outside the United States. The FAA reserves the right to interview the applicant's supervisors, inspectors, and/or personnel responsible for final approval for return to service.

NOTE: The FAA may accept the personnel certification requirements in the country where the repair station is located, provided the English language requirements are met.

F. English Language Requirements for Technical Data. The FAA recognizes the national language of the country where the repair station is located. The repair station may convert technical data, such as operators' instructions for continued airworthiness (ICA), manufacturers' maintenance manuals, or type certificate holders' (TCH) continuous airworthiness data, into the national language. The repair station may also convert internal documents, such as workcards, worksheets, and shop travelers.

NOTE: The repair station must establish procedures in its RSM that ensure that its English language copy of technical data, and any internal documents developed from this technical data, are current and complete. The main base of the repair station should retain the English language copy of the technical data. The repair station must make the data available to the FAA upon request.

2-1248 CERTIFICATION—COORDINATION REQUIREMENTS. This task requires coordination between the ASIs (Maintenance and Avionics). Additionally, multiregional coordination may be required.

2-1249 CERTIFICATION—REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Title 14 CFR Parts 39, 43, 45, 65, 91, 121, 125, 135, and 145.
- AC 00-56, Voluntary Industry Distributor Accreditation Program.
- AC 20-62, Eligibility, Quality, and Identification of Aeronautical Replacement Parts.
- AC 21-29, Detecting and Reporting Suspected Unapproved Parts.
- AC 43.9-1, Instructions for Completion of FAA Form 337.
- AC 120-78, Acceptance and Use of Electronic Signatures, Electronic Recordkeeping Systems, and Electronic Manuals.
- AC 145-9, Guide for Developing and Evaluating Repair Station and Quality Control Manuals.
- AC 145-10, Repair Station Training Program.

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- AC 187-1, Flight Standards Service Schedule of Charges Outside the United States.
- Volume 2, Chapter 11, Section 1, Introduction.
- Volume 2, Chapter 11, Section 4, Evaluate a Part 145 Repair Station Manual and Quality Control Manual or Revision.
- Volume 2, Chapter 11, Section 5, Evaluate Part 145 Repair Station Facilities and Equipment.
- Volume 6, Chapter 9, Section 20, Inspect Part 145 Repair Stations Located Outside of the United States.
- FAA Order 8130.21, Procedures for Completion and Use of the Authorized Release Certificate, FAA Form 8130-3, Airworthiness Approval Tag.

B. Forms:

- FAA automated repair station OpSpecs.
- FAA Form 8000-4, Air Agency Certificate.
- FAA Form 8310-3, Application for Repair Station Certificate and/or Rating.
- FAA Form 8400-6, Preapplication Statement of Intent.

C. Job Aids. None.

2-1250 CERTIFICATION—PREAPPLICATION PHASE.

A. Response to Initial Inquiry. Respond to an initial inquiry for a repair station or satellite facility certificate.

B. Discussion Topics. Discuss with the applicant the following subjects, which may be discussed during the initial inquiry or the preapplication meeting:

1) The necessary technical expertise required by the applicant's proposed organization, to include the following:

- Aviation-related experience;
- Proposed organizational structure;
- Knowledge of the specific maintenance functions to be performed;
- Payment requirements, per part 187, including a deposit so the certification process can proceed past the application phase;
- Providing the FAA with supporting documentation that meets the perceived need required for the FAA certificate;
- Certificate duration period;
- English language personnel requirements; and
- English language requirements for technical data.

NOTE: Advise the applicant that the FAA will charge a fee for initial and renewal certifications and for each time it amends the repair station certificate.

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NOTE: Advise the applicant that its initial repair station certificate is effective from the date of issue until the last day of the 12th month. After the initial certification period, the FAA will renew the certificate for a 24-month period if the repair station has operated per applicable requirements of part 145 within the preceding period. When the FAA grants a certificate renewal for up to 24 months, the PI will advise the repair station that the FAA must conduct annual surveillance, and the repair station must pay any fees required by part 187. Part 187 requires payment for surveillance activity and any associated administrative fees during the nonrenewal year.

2) The requirements for sufficient personnel to meet the demands of the proposed repair station. Advise the applicant that the FAA may interview its supervisors and inspection personnel to confirm their qualifications. The FAA recommends that the supervisors and inspection personnel hold certificates issued by the AA of the country where the repair station is located, as applicable. However, the certificates are not required by regulation.

3) Facility and tooling requirements for the ratings sought, to include:

a) The facility must meet the requirements of § 145.103, including:

- Sufficient workspace and areas to ensure the proper segregation and protection of articles while work is being performed;
- Suitable racks, hoists, trays, stands, and other segregation means for the storage and protection of articles undergoing maintenance or alterations;
- Sufficient space to segregate articles and materials stocked for installation from articles undergoing maintenance or alteration;
- Adequate ventilation, lighting, and control of temperature, humidity, and other climatic conditions to ensure that personnel can perform maintenance as required by this part; and
- Suitable permanent housing to enclose the largest type and model of aircraft listed on its OpSpecs.

b) Manufacturer-recommended or equivalent test equipment.

c) Special tools and any documentation supporting the repair station's use of equivalent tooling. See the note under subparagraph 2-1253B6)b) for extra guidance on approving equivalent tooling and test equipment.

4) The requirement for current technical data appropriate for maintenance, preventative maintenance, or alterations. The following are considered technical data:

- Airworthiness Directives (AD),
- ICAs,
- Maintenance manuals,
- Overhaul manuals,
- Standard practices manuals,

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- Service Bulletins (SB), and
- Other applicable data acceptable to or approved by the FAA.

5) The requirement to provide the FAA with a POC.

C. Paperwork and Timeframe. The IFO will furnish FAA Form 8400-6 to the applicant with instructions for completion. The IFO will advise the applicant to submit the completed PASI to the IFO. The IFO will inform the applicant that the certification process cannot continue until the IFO reviews and accepts the PASI.

1) The FAA should advise the applicant of the complexity of the process and give the applicant an estimated timeframe for the completion of the project. This is a recommendation only; the timeframe helps the applicant make appropriate business decisions and is dependent on the applicant's ability to comply with the requirements.

2) Advise the applicant that it must submit all required documents to the FAA in the English language.

3) Advise the applicant to develop a timeline so that all involved are aware of their commitments and obligations.

NOTE: The ASI should advise the applicant that there are time restrictions for processing applications, due to FAA resource availability.

D. PASI Review. The IFO will review the PASI for acceptance and completeness. Once the IFO accepts the PASI, the office must follow the Flight Standards Service (AFS) Certification Services Oversight Process (CSOP), as directed by the current edition of FAA Order 8000.92, AFS Certification Services Oversight Process (CSOP), for all PASIs received in the office.

NOTE: Each IFO will keep CSOP current for all certification projects.

1) The IFO manager or designee will assign an inspector or a team of inspectors, depending on the application's complexity, to the certification process. The manager will also designate an inspector as the PI.

2) The inspector will obtain the precertification number from AFS-620.

3) The inspector will check the "Information only" block and enter the date the PASI was received and reviewed by the IFO.

4) Normally, the precertification number is the same as the final certification number, except that it has a letter added that identifies it as a precertification number. This enables the applicant to develop draft documents that may be required for inclusion in the RSM, such as return-to-service tags.

5) The PI will contact the applicant to arrange a preapplication meeting.

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E. Conduct a Preapplication Meeting. Meet with the applicant to discuss such topics as questions concerning the certification process, regulatory requirements, each item discussed in subparagraph 2-1250B, and the formal application and attachments. Accomplish the following during the meeting(s):

1) Discuss in detail each of the items identified in subparagraph 2-1250B to ensure the applicant has a complete understanding of the process and procedures.

2) Discuss the regulations applicable to the proposed maintenance operation.

3) Provide the applicant with:

- A copy of AC 145-9,
- A copy of AC 145-10, and
- A copy of FAA Form 8310-3, including a list of functions that the applicant intends to contract to another facility.

4) Inform the applicant that a formal application package for a repair station certificate located outside the United States and its territories must contain:

a) A completed FAA Form 8310-3.

b) A copy of the RSM and QCM for the IFO in a format acceptable to the FAA. Advise the applicant to follow the content of AC 145-9. Also, advise the applicant to develop its manuals as applicable to its repair station. If the applicant submits the manual(s) in electronic media format, the manual(s) must be compatible with FAA electronic capabilities and free of any programs that would adversely affect that capability. See Volume 2, Chapter 11, Sections 1 and 4, for additional details.

NOTE: A transmittal document that describes the submission and is signed by the appropriate manager must accompany repair station document submissions requiring approval. ASIs will approve submissions using a transmittal document listing the date; the document, manual, or revision number; and an approval statement. Additionally, ASIs will reject a certificate holder's submission using a transmittal document that shows the date; the document, manual, or revision number; and a detailed explanation of discrepancies or nonconformances noted. The IFO will maintain office copies of correspondence with the certificate holder in its folder, or will maintain them electronically, if so equipped.

NOTE: Transmittal documents include cover letters, memos, emails, faxes, or any other media acceptable to the IFO.

c) A letter requesting that the FAA process the application, and indicating when facilities, equipment, material, and data will be ready for formal inspection.

d) A letter of compliance.

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e) Documentation confirming the perceived need requirement. In the statement of perceived need, the applicant should indicate its need to perform maintenance on or alter/modify aeronautical products subject to U.S. airworthiness regulations in foreign countries, and to obtain a part 145 repair station certificate. The applicant can express this perceived need by including a statement from an operator of U.S.-registered aircraft; a company that maintains or alters items to be installed on U.S.-registered aircraft, indicating that the repair station's services are required; or documentation from a leasing company or a supplier/distributor showing that the applicant's services are necessary. The applicant can confirm in writing that the leasing company or supplier/distributor is doing business with operators of U.S.-registered aircraft.

1. If the repair station adds a component, appliance, or part thereof to an existing capability list (CL), the repair station is not required to show a need for the additional items.

2. If the repair station is adding a new aircraft make/model, engine make/model, or propeller make/model (type certification (TC) product), or is asking for an additional rating, the repair station must obtain a copy of the customer's document to show a need for the additional items and/or ratings and make that document available to the FAA for inspection.

f) The make and model of the particular item(s) the repair station will maintain, and the nature of the work it will perform, when the applicant is requesting a limited rating.

g) The propeller by make and model, when the applicant is requesting a Class 2 Propeller Rating.

NOTE: When an applicant requests a limited specialized services rating, and the specification is one the applicant develops, advise the applicant that the IFO and the Aircraft Certification Office (ACO) must review the specification. This may cause some delay in the repair station certification process.

h) An employee training program approved by the FAA, consisting of initial and recurring training. An applicant must submit a training program for approval per §§ 145.51(a)(7) and 145.163.

1. The training program must ensure that employees assigned to perform maintenance, alterations, or an inspection function can perform the assigned task.

2. The repair station must document, in a format acceptable to the FAA, employee initial and recurrent training.

i) An estimate of the approximate cost of the certification process. The applicant should deposit the certification fee per IFO procedures. Under no circumstance should a cash transaction take place. The inspector should not be involved in fee transfers. The applicant should transfer the fee electronically into a bank account established by the IFO or another government agency account, such as the embassy's.

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j) The requirement for the letter certifying that hazmat employees have been trained to ICAO hazmat standards, as described in subparagraph 2-1244B1)c)5.

NOTE: At the end of the preapplication meeting, the IFO should have a procedure to start tracking all costs associated with the certification process, per part 187.

5) The FAA inspector or team will evaluate the results of the preapplication meeting and proceed to the formal application phase if results are acceptable.

2-1251 CERTIFICATION—FORMAL APPLICATION PHASE.

A. Receive the Formal Application. Ensure that the applicant has submitted all documents and that they are complete.

B. Verify Fee Deposit. The appropriate fee deposit must be made before proceeding.

C. Evaluate the Application Package. Based on the initial survey of the application package, ensure that all the appropriate documents identified in the preapplication phase have been received. A team decision must be made on whether to continue with the certification process. See subparagraph 2-1250E4).

D. Conduct an Application Meeting with the Applicant, as Necessary. The FAA recommends that the applicant meet with the IFO to formally submit its documents in person and discuss any questions or open issues, which must be resolved before proceeding to the next phase. This should be done in the most cost-effective way possible, such as using meetings, teleconferences, or other correspondence, at the discretion of the PI.

2-1252 CERTIFICATION—DOCUMENT COMPLIANCE PHASE.

A. Review the Application Package. The ASI should review the content of each submitted document for regulatory compliance, including:

1) A completed FAA Form 8310-3.

2) The RSM. This should describe how each function of the repair station performs its intended operation. It should contain samples of all forms, such as tags and shop travelers. It should also locate such items as work orders, workcards, and customer lists. The manual should provide a complete description of how the repair station conducts its business. It should be written plainly enough that repair station employees can understand its contents. The RSM will be used when performing the inspection phase of the certification process. Refer to § 145.209 for manual content. For any additional information, refer to AC 145-9 and Volume 2, Chapter 11, Section 4.

3) The QCM. This may be incorporated as a separate section of the RSM; it does not need to be a separate manual. Refer to § 145.209 for manual content. For any additional information, refer to AC 145-9 and Volume 2, Chapter 11, Sections 1 and 4.

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4) Employee training programs. A CRS must have an employee training program approved by the FAA that consists of initial and recurring training. To meet the requirements of part 145, an applicant must submit a training program for approval per §§ 145.51(a)(7) and 145.163.

5) Sufficient training. The training program must enable those employees assigned to perform maintenance, alterations, or inspections to perform those functions.

6) Training documents. The repair station must document initial and recurrent training of individual employees in a format acceptable to the FAA.

7) Letter of compliance. The letter of compliance must address each section of part 145.

8) If applicable, a letter certifying that hazmat employees have been trained to ICAO hazmat standards in subparagraph 2-1244B1)c)*5*.

9) Personnel certifications. The applicant must submit a list of personnel who meet the following certification requirements:

a) Personnel requirements for a foreign repair station differ from domestic requirements in that Airman Certificates are not required for supervisory or inspection positions.

b) Supervisory and inspections personnel in the country where the station is located do not require a Mechanic/Airman Certificate. Instead, the performance qualifications for supervisory and inspections personnel may be based on training, knowledge, experience, or practical tests. The appropriate repair station manager will determine these requirements. The FAA may conduct interviews of the individuals during the inspection phase to verify their qualifications.

c) Qualifications for supervisory and inspection personnel responsible for return to service include the ability to understand:

- Applicable FAA regulatory requirements,
- FAA ADs,
- Maintenance and service instructions for work items,
- U.S. Type Certificate Data Sheets (TCDS), and
- The ability to read, write, and understand the English language.

10) The list of makes and models of the particular item(s) to be maintained and the nature of the work to be performed for any limited ratings.

11) The list, by make, of the propeller for a Class 2 Propeller Rating.

12) A copy of the approved specification for the work for a specialized service rating, when applicable.

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13) A copy of a CL, if appropriate. Refer to § 145.215 and Volume 2, Chapter 11, Section 1, for additional details on CLs.

14) Line maintenance. A repair station may be issued a repair station certificate and rating for a limited airframe for line maintenance. The line station must be listed on the OpSpecs, which must contain the airport address, the address/phone number/fax number of the repair station's facility/office at each airport location, and a brief description of the maintenance services provided.

NOTE: All certificated repair stations must have suitable permanent housing and facilities. Although § 145.205(d) allows some deviation from the housing requirement, that requirement is based upon the repair station having suitable housing at another location that meets the requirements of part 145. If line maintenance is the only maintenance a repair station is authorized to perform, the repair station must still meet the housing and all other applicable requirements of part 145. Housing need not be on the airport where the line maintenance is performed, but the street address must be listed on the OpSpecs of the repair station where the authorized line maintenance is to be performed.

B. Document Deficiencies. Conduct a thorough and comprehensive review of all documents. If deficiencies are found in any document, return it to the applicant with a letter outlining the deficient areas. Inform the applicant that the certification process will not continue until all deficiencies are resolved. The applicant must give the FAA a written response that identifies the approximate date the errors will be corrected and the document resubmitted. An ASI's letter to the applicant must be as clear and complete as possible to avoid causing delays from documents being mailed back and forth without resolving issues.

2-1253 CERTIFICATION—DEMONSTRATION AND INSPECTION PHASE.

A. Coordinate and Schedule an Inspection. The PI, team members, and the applicant must coordinate to ensure appropriate management personnel are available during the inspection.

1) Manuals. During the inspection phase, the team should verify that the facility follows its RSM and the QCM.

NOTE: When the RSM is in the work area and is in the national language, the applicant must provide the FAA team with a supervisor or other person who can read the national language version to the team so it can confirm that this version has the same information as the English language version. This also applies when the FAA requests review of maintenance records, technical documents, and other material that is part of the certification. The use of the national language is an option provided to repair stations located outside the United States. If a repair station elects to use the national language, it must provide a method for the FAA to confirm the material is accurate. To improve the review process, use the required checklists located at http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs300/part45_checklist/.

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2) Letter of Compliance. The team should use the repair station letter of compliance to confirm that the facility meets all the requirements of the regulations.

3) Line Stations. On an initial repair station certification only, the FAA should visit each location for which the applicant requests a line station authorization. The authorization may not be issued for a location outside the boundaries of the country in which the repair station does business.

4) Geographic Authorizations. Only issued to a repair station rated for an entire aircraft, such as a Boeing 757. (See paragraphs 2-1257 through 2-1274.) On initial certification, the FAA will not normally consider issuing a geographic authorization.

B. Perform a Housing and Facility Inspection. Inspect the repair station facilities to confirm those facilities protect work from weather elements, dust, and heat. Confirm the facility protects workers such that it does not impair the quality of their work. For additional guidance on facilities inspection, see Volume 2, Chapter 11, Section 5. Also inspect:

1) The inspection system, to ensure that:

a) Employees are familiar with and can perform their assigned duties.

b) Facilities can adequately accommodate inspections, as defined in the RSMs and QCMs.

c) The repair station has a QC system that confirms that articles are Airworthy after the repair station, or any of its contractors, perform maintenance.

NOTE: See Volume 2, Chapter 11, Section 4, for additional information.

2) The maintenance recordkeeping system, to ensure compliance with § 145.219.

3) A system for reporting serious defects or unairworthy conditions, to ensure compliance with § 145.221.

4) Tooling and equipment are properly stored and maintained in good working order. Inspect tools and equipment for:

a) Calibration at established intervals.

b) A contract, available for review, to ensure that tools and equipment will be made available upon the repair station's request, if special equipment and tools are obtained as needed per § 145.109.

5) The material needed for the rating. Ensure that this material is on the premises and under the repair station's control when work is being done.

a) Ensure that the repair station has controls for stored material and a recordkeeping system that has document traceability back to the place of purchase or traceability

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back to an approved source/vendor. Some materials, such as advanced composite materials or adhesives, have special handling, storage, recordkeeping, and purchasing requirements. AC 00-56, AC 20-62, and AC 21-29 provide additional guidance.

b) Confirm that the traceable materials in the supply room have documentation to show material qualification, such as invoice, process specifications, or supplier qualifications.

c) If necessary, a surveillance program of the facility's suppliers will meet the traceability requirements.

6) Calibration standards.

a) All measurement and test equipment used to test or inspect articles to make airworthiness determinations are calibrated and traceable to standards acceptable to the FAA. Traceability is established by verifying the measuring and test equipment was calibrated by an accredited laboratory or the standards referenced on calibration certificates are traceable to an accredited laboratory. The statement "traceable to NIST" on a calibration certificate without any further evidence linking the standard used to an accredited laboratory would not meet the National Institute of Standards and Technology's (NIST) definition of traceability.

NOTE: The part 145 rule states that tooling used to make airworthiness determinations must be calibrated to a standard acceptable to the FAA. Those standards may be derived from the NIST to a standard provided by the equipment manufacturer or other recognized standards. The International Bureau of Weights and Measures (BIPM) is a recognized authority that maintains a global list of National Metrology Institutes (NMI). The BIPM Web site lists the NMI signatory countries that participate in the International Committee for Weights and Measures (CIPM). The CIPM Mutual Recognition Arrangement (MRA) signatories are acceptable to the FAA and can be found at http://www.bipm.org. There are many accreditation bodies that provide third-party laboratory accreditation. The International Laboratory Accreditation Cooperation (ILAC) establishes a global network for accreditation of laboratory and testing facilities. Signatories to the ILAC MRA are in full conformance with the standards of International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) 17011. ILAC MRA signatories are acceptable to the FAA and can be found at http://www.ilac.org. Accredited laboratories have already established traceability through the assessment and accreditation process under ISO/IEC 17025. No further documentation is required once traceability is confirmed to a recognized accredited laboratory. Additionally, for foreign equipment, the standard of the country of manufacture may be used if acceptable to the Administrator.

b) Test and measuring equipment (equivalent) manufactured by a repair station must meet the calibration standards recommended by the manufacturer of the article being measured or tested. This type of test equipment calibration is expected to be traceable to a standard acceptable to the FAA.

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NOTE: Designated Engineering Representatives (DER) may neither approve nor determine equivalency of tooling and test equipment. Neither the FAA nor a DER may approve equipment and/or test apparatus. The FAA and DERs may only accept functional equivalency for special equipment or test apparatus. The repair station bears the burden of demonstrating equivalency, not the FAA.

c) During initial certification, all tools and equipment must be in place at the time of certification or rating approval for inspection by the FAA. Refer to § 145.51(b).

C. Evaluate the Maintenance Organization (MO). Ensure that:

1) Sufficient personnel are available to satisfy the volume and type of work to be performed, as required by part 145 subpart D. Also ensure that:

a) An employee is designated as the accountable manager.

NOTE: A European Aviation Safety Agency (EASA)-accountable manager operates a repair station and has corporate authority for ensuring that all maintenance required by the customer can be financed and carried out to the standard required by the EASA full-member authority. An EASA-accountable manager may also qualify as an FAA-accountable manager.

b) Qualified personnel can plan, supervise, perform, and approve work for return to service for which the facility is rated.

c) The facility has enough employees with the training or knowledge and experience to accomplish the work being performed.

1. Interview a sampling of supervisors and inspection personnel to ensure that they can read, write, and understand the English language.

2. During the interview, review and ask the supervisors and inspectors questions about an intended operation regarding their knowledge and experience level. A recommended source for questions is the RSM and/or employee employment summaries.

3. Request to see Air Agency maintenance certification, which supervisors and inspectors may have been issued by the AA.

4. If qualifications remain in question for any individual, inform the repair station management of the concern and request they reexamine the employee and confirm qualifications.

d) The repair station has a written process to determine the abilities of its noncertificated employees performing maintenance functions based on training, knowledge, experience, or practical tests. This process may be part of the RSM or a supplemental document, such as a training program.

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2) A personnel roster is available that lists management, supervisory, and inspection personnel responsible for the repair station operations and oversight of maintenance functions, and authorized to sign a maintenance release for approving an article for return to service. Refer to § 145.161.

3) Management, supervisory, and inspection personnel employment summaries are available for those individuals listed in subparagraph 2-1253C2). Refer to § 145.161.

4) After the inspection, FAA personnel must discuss deficiencies with the applicant. This should be an open discussion, enabling the applicant to correct any misunderstandings. This meeting should not be confrontational, but should be considered part of the informational process.

D. Additional MO Inspection Items.

1) Additional Facility Fixed Locations. The inspection procedures are the same as those required for a fixed location. See Volume 2, Chapter 11, Sections 1 and 5, for more guidance.

2) Work Performed at Another Location. The process for this inspection is different from additional fixed locations. A repair is occasionally needed at another location on an emergency basis. The RSM should have a procedure describing how the repair station will meet the requirements of its manual, including QC procedures, when working away from the fixed location. The procedures must include how the repair station will notify the FAA and gain approval before work is performed. Additional guidance is in Volume 2, Chapter 11, Sections 1 and 5.

3) CL. For a repair station using a CL, it is not necessary to perform a complete facility inspection for each item on the CL. A review of each shop area should provide the FAA inspector with enough general information to establish the applicant's ability and compliance posture.

E. Analyze Deficiencies.

1) If deficiencies are noted, notify the applicant in writing. If appropriate, meet with the applicant to review deficiencies in detail.

2) The applicant must take corrective action and notify the PI in writing for the certification process to continue. Each deficiency and corrective action must be fully documented and recorded in the certification file.

3) Depending on the severity of the findings, a repeat inspection may be necessary. The PI will make this decision based on safety issues only; administrative issues are not considered safety issues.

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2-1254 CERTIFICATION—CERTIFICATION PHASE.

A. Prepare Certificates. When the applicant has met all regulatory requirements, the PI will:

1) Complete blocks 6 through 10 of FAA Form 8310-3 to show:

- Remarks or discrepancies noted during inspection,
- Findings and recommendations,
- Date of inspection, and
- Office and signature of the PI.

2) Prepare FAA Form 8000-4, which the IFO manager must sign.

3) Prepare FAA automated repair station OpSpecs. The appropriate Airworthiness ASI will sign the OpSpecs, which will show the limitations to be issued.

NOTE: Air Agency Certificates and OpSpecs are legal documents. The language should clearly specify the authorizations, ratings, and/or limitations being approved. When completed, these forms should have no erasures, strikeovers, or typographical errors.

B. Prepare Air Agency Certificates. The certificate will include the following information:

1) After "Number," insert the certificate number assigned to the facility, per the current air agency numbering system.

2) Under "This certificate is issued to," insert the official name of the applicant's business, as shown on the application form.

3) Under "whose business address is," insert the address/location of the applicant's business, as shown on the application form.

4) After "to operate an approved," insert the words "repair station."

5) Under "with the following ratings," insert the ratings issued. The ratings must be listed by the general category, such as airframe, powerplant, or radio.

6) Limited ratings are issued to a certificated repair station that maintains only a particular type of airframe, engine, propeller, radio, instrument, or accessory or part thereof, or provides specialized maintenance requiring equipment and skills not ordinarily performed under other repair station ratings. Such a rating may be limited to a specific model aircraft, engine, or constituent part, or to any number of parts made by a particular manufacturer.

7) When ratings are added or amended, show the date of each issuance in parentheses after the added or amended rating.

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8) For repair stations located outside the United States, insert the expiration date (refer to § 145.55). A renewal of a repair station located outside the United States should be issued for an initial certification period of 12 months. Thereafter, the FAA will renew the certificate for a 24-month period from the date of renewal, unless coordinated through the RO. See paragraphs 2-1257 through 2-1265.

9) Under "Date issued," insert the issuance date of the certificate. This will be the date of original certification.

10) Under "By direction of the Administrator," insert the signature of the office manager and office identifier.

11) This certificate is not transferable, and the repair station must immediately report any major change in the basic facilities or in the location thereof to the appropriate FAA RO.

C. Prepare OpSpecs.

1) Following "The rating(s) set forth on Air Agency Certificate Number," insert the Air Agency Certificate number from the respective certificate.

2) Following "is/are limited to the following," insert, as applicable:

- Limited ratings, to include makes, models, or parts;
- Limited ratings, identifying maintenance limitations (e.g., "limited to maintenance and/or repair not including overhaul");
- Limited rating for specialized services, including the specification used;
- Following "Delegated authorities," insert "None";
- Under "Date issued or revised," insert the date the inspection was satisfactorily completed; and
- Under "For the Administrator," insert the signature block of the assigned inspector.

D. Prepare Certification Report. Ensure that the PI prepares the certification report properly and signs it. The report must include the name and title of each ASI on the certification team. The report should contain at least:

- A copy of the PASI,
- FAA Form 8310-3 completed,
- A letter of compliance,
- A copy of the certification of hazmat training,
- A copy of the Air Agency Certificate issued,
- A copy of the issued OpSpecs,
- A summary of all discrepancies encountered during the inspection, and
- A copy of the statement/document of need showing the necessity for the certificate.

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E. Inform the TSA. Upon completion of the FAA's certification phase, the FAA manager (or delegate) will inform the TSA when an FAA Part 145 Certification and Air Agency Certificate has been issued. The email addresses listed below may be used as points of contact for FAA notifications.

- For repair stations located within the United States: ARS@tsa.dhs.gov.
- For repair stations located outside the United States: FRS@tsa.dhs.gov.

2-1255 CERTIFICATION—TASK OUTCOMES.

A. Complete the PTRS Record.

B. Complete the Certification Task. Completion of the certification task will result in one of the following:

- Issuance of a certificate and OpSpecs,
- A letter to the applicant indicating that the certificate is denied, or
- A letter to the applicant confirming termination of the certification process.

NOTE: Verify that fees have been paid in full. Deposit fees per part 187 and IFO procedures. See subparagraph 2-1250E4)i) for information on processing fees.

C. Certification Report Distribution. Distribute the completed report as follows:

1) Retain the original certification report in the IFO.

2) Send a letter to the AA of the country where the repair station is located, advising them that the FAA certificate and OpSpecs have been issued. The letter should also request that the Air Agency advise the IFO any time the AA takes certificate action or identifies serious concerns about that repair station.

D. Document Task. File all supporting paperwork in the certificate holder's/applicant's office file. Document the status in the CSOP and update the enhanced Vital Information Database (eVID).

2-1256 CERTIFICATION—FUTURE ACTIVITIES. The IFO must ensure an orderly transition from the certification process to certificate management. Perform followup inspections and surveillance inspections, as required.

2-1257 RENEWAL—PREREQUISITES AND COORDINATION REQUIREMENTS.

A. Prerequisites:

- Knowledge of the regulatory requirements of part 145 and completion of FAA Course 21058, Certification and Surveillance of Part 145 Repair Stations.
- Successful completion of the Airworthiness Inspector Indoctrination course(s) or equivalent.
- Previous experience with certification or surveillance of part 145 repair stations.

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B. Coordination. This task requires coordination between Airworthiness and Avionics ASIs. Multiregional coordination may be required.

2-1258 RENEWAL—REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Title 14 CFR Parts 43, 45, 65, 121, 125, and 135.
- AC 145-9, Guide for Developing and Evaluating Repair Station and Quality Control Manuals.
- AC 145-10, Repair Station Training Program.
- Volume 2, Chapter 11, Section 1, Introduction.
- Volume 2, Chapter 11, Section 2, Procedures for Certificating Part 145 Repair Stations/Satellites Located Within the United States and Its Territories.
- Volume 2, Chapter 11, Section 4, Evaluate a Part 145 Repair Station Manual and Quality Control Manual or Revision.
- Volume 2, Chapter 11, Section 5, Evaluate Part 145 Repair Station Facilities and Equipment.
- Volume 6, Chapter 9, Section 20, Inspect Part 145 Repair Stations Located Outside of the United States.

B. Forms:

- FAA automated repair station OpSpecs.
- FAA Form 8000-4, Air Agency Certificate.
- FAA Form 8310-3, Application for Repair Station Certificate and/or Rating.

C. Job Aids. Part 145 Repair Station Inspection Checklists at http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs300.

2-1259 RENEWAL—PREAPPLICATION PHASE. The preapplication phase is not required for a renewal of a repair station certificate.

2-1260 RENEWAL—FORMAL APPLICATION PHASE.

A. Renewal Timeframe. A repair station located outside the United States must renew its certificate 12 months after its initial certification, and thereafter no more than 24 months from the date of its last renewal.

NOTE: Although the regulation indicates a 24-month renewal period, ASIs must perform annual surveillance of repair stations, per current policy.

B. Application Submission Timeframe. The repair station must submit a new application 30 days before the expiration date of its certificate.

C. IFO. The IFO must track renewal dates to establish an effective yearly work program.

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D. Documents. ASIs should ensure that all documents for the formal application package have been submitted and are complete. Verify the inclusion of:

1) Completed FAA Form 8310-3.

2) A statement/document about the repair station's continuing need for the FAA certificate. See information on perceived need in subparagraph 2-1247B.

3) A list of contractors, if changes have been made to the list since the repair station's last renewal. A copy of those changes must be included in the package.

4) The RSM/QCM, if either of the manuals has been revised since the repair station's last renewal. A copy of the revision must be provided with the application package.

2-1261 RENEWAL—DOCUMENT COMPLIANCE PHASE.

A. Review the Application Package. Review the content of each submitted document for regulatory compliance. The documents to be reviewed include:

1) A completed FAA Form 8310-3.

2) A perceived need document.

a) The Assistant Chief Counsel for Regulations (AGC-200) recently provided a legal interpretation of §§ 145.51(c) and 145.55(b) concerning the showing of need by a foreign repair station. Although the requirement has not changed for a foreign repair station to "show that the repair station certificate and/or rating is necessary for maintaining or altering" U.S.-registered aircraft and articles, the guidance for showing continuing need may require updating.

b) The legal interpretation included the following statements: "The regulatory history makes clear the FAA's rationale for requiring a showing of need as a qualification for issuing a certificate to a repair station located outside the United States. […T]his history emphasized the importance of not burdening the FAA's resources in certificating and recertificating such repair stations if they are not going to be supporting U.S.-registered aircraft and products. Implicit is the concern over expending those FAA resources in surveiling [sic] such repair stations. For the reasons discussed above, some flexibility is necessary in implementing this policy, and it must not be applied arbitrarily. As a matter of law, however, we believe the showing of need requirement is a continuing obligation."

NOTE: The full text of the memorandum, dated December 9, 2008, is available at http://www.faa.gov/about/office_org/headquarters_offices/agc/pol_adjudication /agc200/interpretations/data/interps/2008/manager-sf-wp-03%20-%20(2008)%20legal%20interpretation.pdf.

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c) If the repair station cannot establish continuing need, the FAA will renew the repair station certificate based on the repair station's previous continuing need statement. However, the FAA will advise the repair station in writing that if the repair station is still unable to show a continuing need at the time of its next renewal, the FAA may not renew the certificate.

NOTE: A renewal applicant does not have to submit an activity report for each article for which it is rated. A single document indicating that minor or no changes were made to its customer list will satisfy the need requirements. The need can be verified during the inspection phase.

3) The repair station's list of maintenance functions contracted to another entity, if changes have been made. Refer to § 145.217 and Volume 2, Chapter 11, Sections 1 and 5, for additional information.

B. Review the RSM/QCM or Section. If revisions are made to these manuals, the revisions should be reviewed as they are submitted. In some cases, a repair station may elect to revise its manuals for its certificate renewal. Regardless of when they are submitted, the FAA must accept these revisions. The revision's inclusion should not delay the renewal process. The FAA may elect to review the revisions and accept or reject them after the certificate renewal has been completed based on the old manuals. Acceptance of the revision must be accomplished per Volume 2, Chapter 11, Section 4.

NOTE: Repair stations do not need to wait until the IFO accepts revisions to implement them. However, if the FAA finds a revision unacceptable, the repair station must have a procedure in place that describes how articles returned to service will be addressed.

C. Document Any Deficiencies. Conduct a thorough and comprehensive review of all documents. If deficiencies are found in any document, return it to the applicant with a letter outlining the deficient areas. Inform the applicant that the certification process will not continue until all deficiencies are resolved or a corrective action plan (CAP) is agreed upon. The applicant must provide the FAA with a written response with an approximate date the applicant will correct the errors and resubmit the document. The inspector's letter to the applicant must be as clear and complete as possible to avoid causing delays from documents being mailed back and forth without resolving issues.

D. Review CAP. Continue with the renewal process if the repair station provides a CAP that satisfies the requirements of the application package.

1) If the applicant fails to submit a CAP or correct the deficiencies within the specified time agreed to between them and the FAA, the FAA will terminate the application for renewal.

2) If the FAA finds the written CAP acceptable, or if the applicant has corrected the deficiencies, it may continue renewing the repair station certificate. See subparagraph 2-1262D1).

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3) If a CAP exists from the previous year's inspection/renewal, the PI must review that plan. During the demonstration and inspection phase of the renewal, the PI must verify that those deficiencies/findings have been corrected.

2-1262 RENEWAL—DEMONSTRATION AND INSPECTION PHASE.

A. Renewal Procedures. When performing a certificate renewal inspection, follow the facility inspection procedures identified in Volume 6, Chapter 9, Section 20. Additionally, use the checklist (accessible via the link below) and maintain them as a record: http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs300/part45_checklist/.

NOTE: For fee collection for air agency actions, the AFS office should follow the guidance in Volume 12, Chapter 13, Section 1, paragraph 12-689. The certificate holder should deposit the fee per part 187, IFO procedures, and AFS-001-000-W2, AFS AC 187-1, As Amended, Fee Payment and Processing. However, during the certification phase, the inspector will confirm that the appropriate FAA fee has been paid in full per part 187 and AC 187-1. See subparagraph 2-1264B1).

B. Line Station Authorization Surveillance. A repair station must conduct a QC system audit to ensure compliance with its QC procedures. The ASI should review the audits of line stations to ensure the repair station has visited each of its line stations once per year. The QC audit should provide a report for each line station showing which station the inspector audited, the date of the audit, what the inspector audited, and findings and corrective action identified during the audit. Once a year, the ASI should perform a physical inspection of a minimum 10 percent sampling of line stations to confirm the effectiveness of the repair station's QC procedures.

NOTE: Line stations outside the geographic boundary of the country where the certificated facility is located will not receive a line station authorization. An authorization request for line stations outside these boundaries must follow the geographic authorization process. See paragraphs 2-1266 through 2-1274.

C. Geographic Authorization Surveillance. A geographic authorization may be issued to a repair station outside the United States to maintain U.S.-registered aircraft outside the country where the repair station certificate is held. See Volume 2, Chapter 11, Section 1, for additional descriptions and guidance on geographic authorization.

1) A repair station QC system is required to audit its geographic authorization location annually to ensure compliance with the RSM and QC procedures. The ASI should review the audits to ensure compliance with the repair station's approved manuals.

2) If the repair station's geographic authorizations are within the geographic boundaries of the certificate-holding district office (CHDO), the ASI should perform an annual 10 percent sampling of the geographic authorization locations.

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3) The inspector should coordinate surveillance of a geographic authorization with the U.S. air carrier certificate management office (CMO) to reduce the possibility of duplicate surveillance and increase the efficient use of resources.

D. Findings/Deficiencies. Due to the distance, travel, expense, and short timeframe requirements associated with repair stations located outside the United States, the ASI should apply the following policy regarding deficiencies/findings noted during the document review and inspection phases:

1) If the FAA discovers deficiencies in document review and inspection phase for renewal or after conducting an inspection (surveillance), the FAA may allow the applicant sufficient time after notification to correct the deficiencies or to submit a CAP, depending on the nature of the deficiencies.

2) Once the applicant has submitted the CAP and prior to acceptance of the plan, the PI will review it and ensure it meets the following requirements:

a) The timeframe for correcting the deficiencies/findings must be 90 days or less.

b) The correction plan must adequately address the deficiencies/findings.

c) The plan must require the applicant to advise the PI in writing when the deficiencies/findings have been corrected.

d) The plan must also contain a procedure for the repair station to validate the process/procedure used to correct the deficiencies/findings. This validation should take place within 90 days or less after the correction was implemented.

3) If the FAA finds the written CAP acceptable, it may renew the repair station certificate.

4) If the part 145 repair station certificate expires either during the time between inspections or due to unusual circumstances, the FAA may need to issue a short-term certificate of up to 90 days if the applicant demonstrates an ability and willingness to correct the noted deficiencies. The FAA may not extend the certificate past the 24-month period.

5) Depending on the nature of the deficiencies, the FAA may amend the repair station's ratings. In any of the above situations, after the FAA is satisfied with all corrective action, the certificate will be reissued using the original renewal date. The repair station should not gain renewal time or an advantage by having additional time allowed for the correction of deficiencies.

2-1263 RENEWAL—CERTIFICATION PHASE.

A. Prepare Certificates. When the applicant has met all regulatory requirements, the PI will accomplish the following:

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1) Complete blocks 6 through 10 of FAA Form 8310-3 to show:

- Any remark or discrepancy noted during inspection,
- Findings and recommendations,
- Date of inspection, and
- Office and signature of the PI.

2) Prepare FAA Form 8000-4, which the IFO manager must sign.

NOTE: Air Agency Certificates and OpSpecs are legal documents. The language should clearly specify the authorizations, ratings, and/or limitations being approved. When completed, these forms should have no erasures, strikeovers, or typographical errors.

B. Prepare Air Agency Certificates. The certificate will include the following information:

1) After "Number," insert the certificate number assigned to the facility. This will be per the current air agency numbering system.

2) Under "This certificate is issued to," insert the official name of the applicant's business, as shown on the application form.

3) Under "whose business address is," insert the address/location of the applicant's business, as shown on the application form.

4) After "to operate an approved," insert the words "repair station."

5) Under "with the following ratings," insert the ratings issued. The ratings must be listed by the general category, such as airframe, powerplant, or radio.

6) Limited ratings are issued to a certificated repair station that maintains only a particular type of airframe, engine, propeller, radio, instrument, or accessory or part thereof, or provides specialized maintenance requiring equipment and skills not ordinarily performed under other repair station ratings. Such a rating may be limited to a specific model aircraft, engine, or constituent part, or to any number of parts made by a particular manufacturer.

7) When ratings are added or amended, show the date of each issuance in parentheses after the added or amended rating.

8) After "shall continue in effect," add "insert the new renewal date." The IFO will renew the repair station certificate for 24 months from the date of the last renewal, unless otherwise coordinated with the RO. Refer to § 145.55.

NOTE: Although the regulation allows for a 24-month renewal period, current policy requires ASIs to perform annual surveillance of repair stations, including those facilities located outside the United States. The renewal ensures the

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repair station does not extend past the mandatory 24-month certificate period, which would require a new certification action, not a renewal.

9) Under "Date issued," insert the original issuance date of the certificate. This will be the date of original certification.

10) Under "By direction of the Administrator," insert the signature of the office manager and office identifier.

11) This certificate is not transferable. The IFO must immediately report any major change in the basic facilities, or in the location thereof, to the appropriate FAA RO.

C. Prepare OpSpecs.

1) Following "The rating(s) set forth on Air Agency Certificate Number," insert the Air Agency Certificate number from the respective certificate.

2) Following "is/are limited to the following," insert, as applicable:

- The associated CL, as described in Volume 2, Chapter 11, Section 1;
- Limited ratings, to include makes, models, or parts;
- Limited ratings, to identify maintenance limitations (e.g., "limited to maintenance and/or repair not including overhaul");
- Limited ratings for specialized services, including the specification used; and
- Line maintenance authorization. The repair station must meet the requirements of § 145.205(d).

3) Following "Delegated authorities," insert "None."

4) Under "Date issued or revised," insert the date the inspection was satisfactorily completed.

5) Under "For the Administrator," insert the signature block of the assigned inspector.

D. Prepare Certification Report. Ensure that a certification report is prepared. The report must include the name and title of each ASI on the certification team. The PI signs the report, which contains at least:

- The completed FAA Form 8310-3, including a list of functions the repair station will contract out, if changed since last renewal;
- A copy of the statement/document of need showing the necessity for the certificate;
- A copy of the Air Agency Certificate issued;
- A copy of the issued OpSpecs; and
- A summary of all discrepancies found during the inspection.

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2-1264 RENEWAL—TASK OUTCOMES.

A. Complete the PTRS Record.

1) Use PTRS activity code 3376/5376 for maintenance/avionics certificate support associated with the certificate renewal process.

2) Use PTRS activity code 3650/5650 for maintenance/avionics surveillance associated with the certificate renewal process. The inspector must follow and complete the risk-based surveillance reporting requirement of Volume 6, Chapter 9, Section 20.

B. Complete the Task. Completion of the certification task will result in one of the following:

1) Verify that the fees have been paid in full. Deposit the fee per part 187 and IFO procedures. FAA policy requires submitting an invoice to the repair station using an items list of fees charged when issuing the certificate. It is permissible to issue a renewal certificate pending receipt of the fee. Due to normal corporate accounting practices, it may take a few weeks before the fee is transmitted.

NOTE: All activities associated with surveillance related to a repair station certificate are chargeable as FAA fees per part 187. Calculate all fees per AC 187-1.

a) If the IFO does not receive the fee within a reasonable period of time, it should advise the repair station in writing that certificate action may be required if the fee is not transmitted as soon as possible.

b) The IFO should establish office policy regarding timeframes and procedures for fee payments. The IFO should be familiar with local mail and electronic transaction timeframes.

2) Issuance of a certificate and OpSpecs.

3) A letter to the applicant indicating the IFO denied the issuance of the certificate, as applicable.

4) A letter to the applicant confirming termination of the certification process, as applicable.

C. Distribute the Certification Report. This report is no longer distributed to the RO. The information may now be found in the PTRS, Safety Performance Analysis System (SPAS), and eVID. Distribute the completed report as follows:

1) Retain the original certification report in the IFO.

2) Send a letter to the AA of the country where the repair station is located, advising it that the FAA certificate and OpSpecs have been issued. The letter should also request that the

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Air Agency advise the IFO anytime the AA takes certificate action or identifies serious concerns against that repair station.

D. Document the Task. File all supporting paperwork in the certificate holder/applicant's office file and update the eVID.

2-1265 RENEWAL—FUTURE ACTIVITIES. The IFO must ensure an orderly transition from the certification process to certificate management. The ASI should perform followup inspections and surveillance inspections, as required.

2-1266 AMENDMENT—PREREQUISITES AND COORDINATION REQUIREMENTS.

A. Prerequisites:

- Knowledge of the regulatory requirements of part 145 and completion of FAA Course 21058, Certification and Surveillance of Part 145 Repair Stations.
- Successful completion of the Airworthiness Inspector Indoctrination course(s) or equivalent.
- Previous experience with certification or surveillance of part 145 repair stations.

B. Coordination. This task requires coordination between Airworthiness and Avionics ASIs. Additionally, multiregional coordination may be required.

2-1267 AMENDMENT—PREAPPLICATION PHASE—ADDING AN ADDITIONAL RATING. The ASI should follow the initial certification procedures in paragraph 2-1250.

A. PASI. A PASI is not required for a change or amendment to a certificate.

1) An application meeting is not required for amending a repair station certificate.

2) The repair station must submit a completed application (FAA Form 8310-3).

3) The repair station must submit a revised letter of compliance that covers the additional ratings.

B. Change to Facility or Address Change.

1) The repair station must submit a new application when a change to the facility affects the repair station certificate. Examples of facility changes include adding additional space or reducing the size of the facility.

2) The repair station must submit a new application prior to moving to a new facility or changing its address. The FAA will review the application and may authorize continued work while the applicant moves to another facility.

C. Change in Ownership. When a repair station sells or transfers ownership of its organization, the new owner must submit a new application.

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1) If the sale or transfer of ownership, normally called a financial takeover, does not affect the employees, facilities, equipment, or daily operation of the repair station, only a new application is required.

2) An applicant must submit a new application and manuals for an ownership change that affects the repair station's daily operation, such as a management change or a facility or equipment change. The application process is the same as for a new application. (See paragraphs 2-1248 through 2-1256 for initial certification procedures.) However, applicants may continue to operate under the existing certificate while the FAA processes the new certification package, unless the ASI and the RO determine that a safety concern prohibits continued operation.

2-1268 AMENDMENT—GEOGRAPHIC AUTHORIZATION.

A. Criteria for Issuing Geographic Authorization. Geographic authorization is different from work away from the station or line station maintenance authorization. The repair station must fulfill the criteria listed below. The ASI should ensure that:

1) The repair station has an airframe rating for a complete aircraft, such as a Boeing 757 or an Airbus 320.

2) The make/model aircraft is operating into the requested location. The aircraft being operated into the requested location need not be the aircraft with a part 129 authorization.

3) The FAA will not issue a geographic authorization at a location where an appropriately rated repair station already exists, unless the U.S. operator shows why the additional geographic authorization is necessary. For example, legitimate reasons for issuing the rating may be that locally rated repair stations cannot meet operator schedules or cannot deal with additional workload.

4) Each geographic authorization is included in the repair station's internal self-evaluation program. The program must include an annual evaluation and report of each geographic authorization location. This report must be made available to the FAA on request.

NOTE: Geographic authorization may not be issued to a location within the United States and its territories. The FAA has determined that ample CRSs are located within the United States to provide service. The intent of a geographic authorization is to give U.S. operators, and foreign operators holding a part 129, § 129.14 authorization, the ability to meet the requirements of their maintenance programs in locations where appropriately rated FAA-certificated repair stations are not available.

B. Geographic Authorization Procedures. The IFO will:

1) Receive notice of the air carrier's need. The process starts when the air carrier notifies its CHDO that it needs the services of a repair station at a location where a geographic authorization is required for the repair station.

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NOTE: An operator under § 129.14 will use the IFO that issued the § 129.14 authorizations.

2) Receive a letter from the repair station requesting geographic authorization. The letter should explain how the repair station will meet the criteria in subparagraph 2-1268A and include a copy of the RSM procedures section addressing geographic authorizations and responsibilities.

3) When eligibility for geographic authorization is established, coordinate closely with the air carrier CHDO to ensure that duplicate efforts do not occur.

NOTE: Certification and surveillance of geographic authorization is the responsibility of the IFO. However, this does not relieve the CHDO of its responsibilities for surveillance of the air carrier's adherence to part 121, § 121.369. The CHDO's coordination with IFOs outside the United States is an efficient method of surveillance of air carrier operations in areas normally requiring the CHDO to use resources better used in other areas. Geographic authorization is limited to line-maintenance-type operations.

4) Receive a copy of the contract from the air carrier's CHDO.

5) Provide the CHDO with a copy of the repair station's commitment to meet subparagraph 2-1268A criteria.

6) Receive a copy of the repair station's self-evaluation report, if applicable. If this is an initial or an added geographic authorization location, the repair station must give the FAA a copy of its self-evaluation report, in which its ability to function at the requested location is expressed.

7) Review the self-evaluation report to ensure that the repair station has trained personnel, tooling, equipment, manuals, and inspection processes to support the requested geographic authorization.

8) Revise the repair station OpSpecs to include the initial or new geographic authorization location. The OpSpecs must list each authorization by location address, make, and model of aircraft. Additionally, list the air carrier customer name and the section of its appropriate air carrier manual by which maintenance will be performed.

9) On an initial geographic authorization, revise the repair station certificate to list the geographic authorization directly below the airframe rating.

10) Forward the revised certificate and OpSpecs to the repair station and send a copy to the CHDO.

NOTE: Do not delay sending a copy of the revised certificate and OpSpecs to the repair station. Delays may adversely affect air carriers meeting their operational schedules.

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C. Surveillance Requirement for Geographic Authorization.

1) It is not necessary for the IFO or the CHDO to conduct an onsite surveillance for a request to add a new location. An additional location may be added without further showing.

2) When conducting repair station certificate renewal or off-year surveillance, the ASI must review the repair station's geographic authorization self-evaluation reports to ensure that each location has been evaluated within the previous year.

3) The IFO must establish an office policy requiring inspectors performing surveillance in a city or country to visit the locations where a repair station has a geographic authorization, provided the visit does not require additional travel within the country or create expenditure of added travel resources. This means the inspector must travel to the locations using ground transportation and must complete the visit within their normal workday, unless otherwise authorized by their supervisor.

4) Forward an explanation of the fees to the repair station's ASI for inclusion in the repair station certificate's renewal cost, which include all times and costs associated with surveilling a geographic authorization.

5) A CHDO may not charge the repair station for any surveillance of geographic authorization it performs as part of its air carrier surveillance.

6) Close coordination must occur between the CHDO, the IFO where the geographic authorization is located, and the certificate holder's IFO to reduce the possibility of multiple surveillance activities. All findings associated with a geographic authorization must be coordinated between offices involved with the geographic location.

7) The IFO that retains the repair station certificate is also responsible for compliance and enforcement activity. It must communicate findings with the air carrier CHDO. Any additional compliance or enforcement action relating to the air carrier is the responsibility of the air carrier CHDO.

2-1269 AMENDMENT—APPLICATION PHASE. Repair stations adding ratings or changes to a certificate will use the same process as renewal of a certificate discussed in paragraphs 2-1257 through 2-1265, but must also include:

- A copy of FAA Form 8310-3, including a list of functions that the applicant intends to contract to another facility;
- A revised letter of compliance that address the items changed, such as added rating or address change;
- A document showing the need for the certificate, as described in subparagraph 2-1250E4)e); and
- If applicable, a revised letter certifying employees have been trained to ICAO hazmat standards, as described in subparagraph 2-1244B1)c)*5*.

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2-1270 AMENDMENT—DOCUMENT COMPLIANCE PHASE. Follow the same renewal process as indicated in paragraphs 2-1257 through 2-1265. The ASI should review any manual revision required by the application for an added rating or change to the certificate for compliance with part 145. Repair stations should process manual revisions and documentation findings as discussed in paragraphs 2-1257 through 2-1265.

2-1271 AMENDMENT—DEMONSTRATION AND INSPECTION PHASE. This phase should follow the same requirements as indicated in paragraphs 2-1257 through 2-1265 as appropriate to the requested change to the repair station certificate and OpSpecs.

2-1272 AMENDMENT—ISSUE OF AMENDED CERTIFICATE AND OPSPECS. Amendments to a repair station certificate and OpSpecs must be accomplished as indicated in this section and must reflect the applicant's requested change.

2-1273 AMENDMENT—TASK OUTCOMES. These are the same as indicated in paragraph 2-1264.

2-1274 AMENDMENT—FUTURE ACTIVITIES. The IFO must ensure that an orderly transition occurs from the certification process to certificate management. Perform followup inspection and surveillance inspections, as required.

RESERVED. Paragraphs 2-1275 through 2-1290.

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VOLUME 2 AIR OPERATOR AND AIR AGENCY CERTIFICATION AND APPLICATION PROCESS

CHAPTER 11 CERTIFICATION OF A TITLE 14 CFR PART 145 REPAIR STATION

Section 4 Evaluate a Part 145 Repair Station Manual and Quality Control Manual or Revision

2-1291 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.

A. Maintenance: 3230, 3371, 3372.

B. Avionics: 5230, 5371, 5372.

2-1292 OBJECTIVE. This section provides guidance for evaluating, accepting, or rejecting all Title 14 of the Code of Federal Regulations (14 CFR) part 145 Repair Station Manual (RSM) and/or Quality Control Manual (QCM) original submissions or revisions.

2-1293 GENERAL.

A. Currency of a QCM. Before issuing an Air Agency Certificate, the applicant's RSM and/or QCM must reflect the applicant's current procedures and be acceptable to the Federal Aviation Administration (FAA).

NOTE: If the training program required by part 145, § 145.163 is included in either of these manuals, that portion must be FAA-approved.

B. Revision of an Existing Manual. The certificate-holding district office (CHDO) must be notified when a certificate holder revises an existing manual.

C. Manual Content. The manuals submitted by a certificate holder or applicant may be separate or may be combined into a single manual. The format should be consistent and all regulatory requirements must be included. The aviation safety inspector (ASI) must ensure that the procedures used in the performance of maintenance, preventive maintenance, or alterations are reflected accurately in the manuals. It is expected that, to fully describe the repair station's inspection/quality system, there will be some procedures that may not be regulatory.

D. Original Certification Versus Revision. When evaluating a manual as part of an original certification, each entire manual will be submitted prior to certification. If this task is performed as a revision, only the portion of the manual that is revised must be submitted.

E. RSM and QCM. Each certificated repair station must maintain a current RSM and QCM.

F. Accessibility of Manual. A certificated repair station's current RSM/QCM must be accessible for use by repair station personnel. All repair station employees on all shifts must have access to the manual, regardless of the media used (electronic, CD-ROM, etc.).

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G. CHDO. A certificated repair station must provide to its CHDO the current RSM/QCM in a format acceptable to the FAA. If the manuals or manual submitted are in electronic media format, they must be compatible with FAA electronic capabilities and free of any programs that would adversely affect that capability.

H. Recommendations for Manual Development. There are some recommendations included in this handbook referenced from the current edition of Advisory Circular (AC) 145-9, Guide for Developing and Evaluating Repair Station and Quality Control Manuals, which are not required by the regulations. They have been included to assist the inspector and certificate holder/applicant in developing a more complete description of the repair station's overall functions, responsibilities, and quality control (QC) procedures.

I. Maintenance and Alterations in Accordance With an Air Carrier's Manuals. For certificate holders under 14 CFR parts 121, 125, and 135, and for foreign air carriers or foreign persons operating a U.S.-registered aircraft in common carriage under 14 CFR part 129, maintenance, preventive maintenance, and alterations must be performed in accordance with applicable sections of that air carrier's manuals.

2-1294 REPAIR STATION AUTHORIZATION TO MAINTAIN CANADIAN AIRCRAFT.

A. Maintenance, Preventive Maintenance, and Modifications. The repair station may perform maintenance, preventive maintenance, and modifications to aircraft certificated in Canada. To perform this work, the repair station must continue to comply with part 145 and the special conditions imposed by the Bilateral Aviation Safety Agreement (BASA) Maintenance Implementation Procedures (MIP).

B. Implementing Required Procedures. The MIP agreement requires U.S. air agencies and Canadian Approved Maintenance Organizations (AMO) to develop and implement stringent controls and procedures at their repair stations. These procedures must become a part of the RSM or a supplement to the manual. The requirements for the supplement are contained in the current United States—Canadian BASA/MIPs.

C. Transport Canada Civil Aviation (TCCA) Inspections. The repair station must allow TCCA, or the FAA on behalf of TCCA, to inspect it for continued compliance with part 145 and MIP special conditions. The repair station must make its manual and the required supplement available for inspection.

NOTE: Investigations and enforcement by the TCCA may be undertaken in accordance with TCCA rules and directives. The repair station must cooperate with any investigation or enforcement action.

2-1295 PREREQUISITES AND COORDINATION REQUIREMENTS. This task may require coordination with other specialties, regions, or district offices.

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2-1296 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Title 14 CFR Parts 1, 39, 43, 65, 91, 121, 125, 129, 135, and 145.
- Canadian Aviation Regulations (CAR) parts IV and VII.
- AC 145-9, Guide for Developing and Evaluating Repair Station and Quality Control Manuals.
- AC 43-10, United States—Canadian BASA/MIP Maintenance.
- United States—Canadian BASA/MIPs.
- Volume 2, Chapter 11, Section 2, Procedures for Certificating Part 145 Repair Stations/Satellites Located Within the United States and Its Territories.
- Volume 2, Chapter 11, Section 3, International Field Office Procedures for Certificating/Renewing/Amending a Part 145 Repair Station Located Outside the United States and its Territories and not Under a Maintenance Implementation Procedure.
- Volume 2, Chapter 11, Section 5, Evaluate Part 145 Repair Station Facilities and Equipment.

B. Forms. None.

C. Job Aids. None.

2-1297 RSM PROCEDURES.

A. Acceptable Formats. Receive the certificate holder or applicant's manual or revision as required by §§ 145.51, 145.207, and 145.211(c).

B. Manual or Revision Content. Review the submitted manual or revision to ensure that it meets the regulatory requirements of §§ 145.209 and 145.211. The manual or revision must include the following:

1) An organizational chart that identifies:

a) Each management position with authority to act on behalf of the repair station.

1. The organizational chart required by § 145.209 may identify management positions by title only.

2. Management includes, but is not limited to, the executive functions of planning, organizing, coordinating, directing, controlling, and supervising.

3. This does not eliminate the requirement in § 145.51 for an applicant to submit the names and titles of its management and supervisory personnel at the time of application.

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b) The area of responsibility assigned to each management position, which is the area(s) in the repair station that the manager is directly accountable for and maintains decision authority over.

c) The duties, responsibilities, and authority of each management position.

2) Procedures for maintaining and revising the rosters required by § 145.161.

NOTE: Within 5 business-days of the revision, the rosters required by this section must reflect changes caused by termination, reassignment, change in duties, scope of assignment, or addition of personnel.

3) A description of a repair station's operations describing how the repair station performs maintenance, where it would start, and how it progresses through the entire repair cycle for approval for return to service. Also include:

a) A description of the housing, which may include dimensions, construction method, heating and ventilation systems, lighting, door openings, and physical address.

b) A description of the facilities including the layout of the shop, hangar, or other work areas.

c) A description of the equipment, tooling, and materials used to perform maintenance.

NOTE: The "description of materials used to perform maintenance" should not be a physical description of the material, but rather an explanation of the repair station's handling and storage of the materials. If materials require specific environmental controls or cannot be stored next to certain chemicals or solvents, these should be identified. For example, it would not be acceptable to store oxygen equipment near petroleum products.

1. If the repair station does not own the equipment, the manual must include procedures that describe how the repair station will obtain the equipment (lease, rentals, etc.). The manual must also include where repair station personnel will use the equipment, how it will train personnel on the proper use of the equipment, and how the repair station will ensure that it addresses calibration issues, if any, after transporting the equipment.

2. If the repair station chooses to use equipment, tools, or materials other than those recommended by the manufacturer, the manual must include a procedure used by the repair station to determine the equivalency of that equipment, tool, or material.

NOTE: When the repair station is adding a rating or an applicant has applied for certification, all required equipment for the rating it seeks must be in place for inspection by the FAA. This provides the ASI with the opportunity to evaluate its placement and use, and to verify that repair station personnel are trained to operate it.

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4) Capability list procedures used to:

a) Revise the capability list provided in § 145.215 and notify the CHDO of revisions to the list, including how often the repair station will notify the CHDO of revisions; and

b) Develop and perform the self-evaluation required by § 145.215(c) for revising the capability list, including the methods and frequency of such evaluations and procedures for reporting the results to the appropriate manager for review and action.

5) Procedures for revising the training program and submitting revisions to the CHDO for approval, which should include:

- The title of the person authorized to make a training program revision;
- The method of submitting a revision (electronic, hardcopy, disk, etc.); and
- A procedure for recording a revision and a method of identifying the revised material or text.

6) Procedures for accomplishing work performed at a location other than the repair station's fixed location, which should contain the following:

a) Title of the person responsible for determining that the location is appropriate for the work performed.

b) Title of the person responsible for initiating such work and assigning the personnel necessary to perform inspections and supervise the work.

c) Procedures for communication between responsible repair station personnel at the fixed location and the maintenance personnel working away from the station. This should include the transfer of parts, supplies, tools/equipment, technical data, and trained personnel.

d) Procedures that maintenance personnel will use when away from the repair station if they deviate from established procedures used at the fixed location. The repair station must ensure that maintenance personnel accomplish all work performed while exercising the privileges of its certificate, per the appropriate maintenance manual and its RSM or QCM. The determination for performing work at another location must meet the following requirements:

1. The work is necessary due to a special circumstance, such as a one-time occurrence, as determined by the FAA; or

2. It is necessary to perform such work on a recurring, but not continuous, basis and the RSM includes the procedures for accomplishing maintenance, preventive maintenance, alterations, or specialized services at a place other than the repair station's fixed location.

NOTE: The FAA must make the determination regarding the performance of work at another location prior to the performance of any maintenance, preventive

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maintenance, or alterations away from the repair station's fixed location unless the manual includes an acceptable procedure.

7) Procedures for performing maintenance, preventive maintenance, and alterations for certificate holders under parts 121, 125, and 135 and for foreign air carriers or foreign persons operating a U.S.-registered aircraft in common carriage under part 129.

a) The FAA requires that maintenance under a Continuous Airworthiness Maintenance Program (CAMP) be performed in accordance with the operator's manual. It is the operator's responsibility to ensure that the work performed on its behalf is in accordance with its approved maintenance program.

b) The certificated repair station that performs maintenance, preventive maintenance, or alterations for an air carrier or commercial operator that has a CAMP under part 121 or 135 must follow the air carrier or commercial operator's maintenance program or applicable sections of its maintenance manual.

c) A certificated repair station that performs inspections for a certificate holder conducting operations under part 125 must follow the operator's FAA-approved inspection program.

d) A certificated repair station that performs maintenance, preventive maintenance, or alterations for a foreign air carrier or foreign operator operating a U.S.-registered aircraft under part 129 must follow the operator's FAA-approved maintenance program.

e) The FAA may authorize a certificated repair station to perform line maintenance on any aircraft of an air carrier certificated under part 121 or 135, or of a foreign air carrier or foreign operator operating a U.S.-registered aircraft in common carriage under part 129, provided the certificated repair station:

- Has the appropriate ratings to perform the maintenance or preventive maintenance on transport-category aircraft;
- Performs such line maintenance in accordance with the operator's manual and approved maintenance program;
- Has the necessary equipment, trained personnel, and technical data to perform such line maintenance; and
- Has operations specifications (OpSpecs) that include an authorization to perform line maintenance.

NOTE: A repair station must be appropriately rated to perform line maintenance for an air carrier. This would normally require an airframe rating to accomplish scheduled checks, daily inspections, or the servicing of articles. However, a repair station with the appropriate ratings may accomplish unscheduled maintenance and repairs. This could include avionics facilities limited to avionics functions such as troubleshooting electrical or electronic systems, or replacing defective electronic articles.

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8) Procedures for performing maintenance, preventive maintenance, and modifications on Canadian aeronautical products.

a) An FAA-certificated repair station may perform maintenance, preventive maintenance, and modifications (with the exception of annual inspections) on a civil aeronautical product under the regulatory control of TCCA. The repair station may approve that product for return to service if the repair station complies with the special conditions stated in the BASA/MIPs between the United States and Canada.

b) In addition to the other requirements specified in the MIPs, a repair station performing maintenance, preventive maintenance, or modifications on aircraft operating in commercial air service under TCCA CAR part IV or VII must include in its manual a supplement describing the procedures listed in AC 43-10, appendix 3, paragraph 3.2, or explain where in the RSM those procedures are described. These procedures must be accepted by the FAA.

9) Procedures for maintaining and revising the contract maintenance information, including the submission of revisions to the CHDO for approval and how often the repair station will notify the FAA of revisions.

a) The FAA must approve the maintenance functions contracted to noncertificated providers.

b) The repair station must maintain a list of each facility that it contracts maintenance functions with, including the type of certificate and ratings (if any) held by each facility.

c) The manual does not need to include the maintenance function list, but the manual should include the location or office where the repair station maintains the list.

NOTE: Maintenance functions are a step or series of steps in the process of performing maintenance, preventive maintenance, or alterations that result in approving an article for return to service. It is not the intent of this rule to create "virtual repair stations" that provide only an approval for return to service. ASIs must evaluate the amount of work a repair station desires to contract out versus the work it performs in-house.

10) A description of the recordkeeping system used by the repair station to obtain, store, and retrieve the records required by part 43. These records must be in English.

11) Procedures for revising the RSM and notifying its CHDO of revisions to the manual, including how often the repair station will notify the FAA of revisions. The procedure must include:

- The title of the person authorized to make a revision;
- The method of submitting a revision (electronic, hardcopy, disk, etc.);

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- A procedure for recording a revision and a method of identifying the revised material or text; and
- A description of the system used to identify and control sections of the RSM.

C. Service Difficulty Reports (SDR) and Suspected Unapproved Parts (SUP). The manual should include the following:

1) Procedures for submitting an SDR; a certificated repair station must report to the FAA within 96 hours after it discovers any serious failure, malfunction, or defect of an article in accordance with § 145.221 and in a format acceptable to the FAA. This is usually in the form of an SDR. If the repair station performs maintenance, preventive maintenance, or alterations for an air carrier, the manual should also contain procedures on how it will notify the operator when submitting reports. The reporting requirement of part 121, § 121.703(d) will be served when an aircraft is scheduled out of service for more than 72 hours due to maintenance, preventive maintenance, or alteration activities. Occurrences and deficiencies must be reported 96 hours after the work on the aircraft is approved for return to service, unless the condition has been reported under another part or section of 14 CFR (e.g., 14 CFR part 21, § 21.3 or § 145.221).

2) Procedures for detecting and reporting SUP.

2-1298 QCM PROCEDURES.

NOTE: The QCM may be separate from the RSM or included in that manual as a separate section or volume.

A. Documentation, Inspections, and Training. A certificated repair station must prepare and keep current a QCM in a format acceptable to the FAA. Depending upon the size, complexity, and rating(s) of the repair station, that manual should include a description of the system and procedures used for:

1) Receiving and documenting articles, standard parts, and raw materials.

2) Performing incoming inspections of raw materials and standard parts that check for:

- Proper documentation, identification, and traceability;
- Conformity to a specification and acceptable quality;
- Shelf life;
- Contamination;
- Shipping damage; and
- State of preservation.

3) Performing a preliminary inspection of all articles that are maintained or altered to check for:

- Proper documentation, identification, and traceability;
- Shipping damage and contamination;

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- State of preservation;
- Life limits;
- Airworthiness Directives (AD) and Service Bulletins (SB);
- Functional test or tear-down inspections;
- FAA approval of new articles; and
- Determination of what repairs are necessary.

4) Inspecting all articles that have been involved in an accident for hidden damage before maintenance, preventive maintenance, or alteration is performed. Ensure that items are disassembled as necessary and inspected for hidden damage in adjacent areas.

5) Performing in-progress inspections to ensure inspections, testing, and/or calibration are conducted at various stages while the work is in progress.

6) Performing final inspections and approvals for return to service.

a) Ensures that inspection, testing, and/or calibration of articles, including documentation, is accomplished at the completion of maintenance or an alteration.

b) The manual must include a procedure for approval for return to service.

7) Ensuring continuity of inspection responsibility.

a) Include procedures for ensuring that the responsibilities of any inspector are properly performed in their absence.

b) If the repair station has multiple shifts, include procedures to ensure the continuing responsibility for maintenance in progress through the use of a status book, shift turnover log, or similar documents.

8) Calibrating measuring and test equipment used in maintaining articles, including the intervals at which the equipment will be calibrated.

9) Taking corrective action on deficiencies related to repair station operation.

a) Section 145.211(c)(1)(ix) states that the QCM must include procedures used for taking corrective action on deficiencies. A corrective action is taken to remedy an undesirable situation. The correction of deficiencies is normally an integral part of a repair station's improvement process, and could include revisions to procedures that were not working properly (refer to AC 145-9, paragraph 4-13 for additional guidance).

NOTE: The repair station is not required at this time to have an Internal Evaluation Program (IEP), quality assurance (QA) program, or a continuous improvement program.

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b) Corrective action requires that a fact-based investigation determine the root cause or causes to eliminate them. Corrective action would be applicable in two situations: before the article is approved for return for service and after the article has been approved for return to service.

c) If a deficiency is found before the article is approved for return to service, the repair station should follow its procedures describing how rework will be accomplished. If the deficiency is noted after the article is approved for return to service, the repair station should follow its procedures to notify the CHDO and the owner/operator of any potential problems and recall any unairworthy parts or products. The objective of the investigation into the cause of the deficiency and the corrective actions taken is to eliminate any potential safety threats posed by unapproved or improperly maintained parts or products and to prevent a recurrence of the same or similar problems.

NOTE: When the CHDO receives notification of a deficiency found after the article is approved for return to service, the principal inspector (PI) must ensure the event is reviewed for possible noncompliance of parts 43 and/or 145. The review should be conducted using the Flight Standards Service (AFS) Compliance Action Decision Procedure in Volume 14, Chapter 1, Section 2. If improper maintenance is found, the ASI shall complete the PTRS records using code 3776/5776 as applicable. If unapproved parts are found, the ASI shall complete the PTRS records using code 3775/5775 as applicable. If the unapproved parts lead to an outside facility that manufactured the parts, an FAA Form 8120-11, Suspected Unapproved Parts Report, should be filed so an Aircraft Certification Service (AIR) investigation can be conducted. If the deficiency is found as a result of an inspection, audit, or evaluation of a maintenance facility located outside of the region, the inspector should contact the region or Flight Standards District Office (FSDO) responsible for the facility that completed the work. The investigating inspector completing the investigation on that facility shall complete the PTRS records using code 3776/5776, as applicable.

d) The procedures in the QCM should include a system for documenting any deficiencies and the corrective actions taken to prevent a recurrence. The system should let employees track any open corrective action requests and the date the corrective action is due. The program should also be tracked to include audits of the corrective action(s) taken to ensure it was effective. These audits should also be tracked to ensure that they are completed in a timely fashion.

10) Establishing and maintaining the proficiency of inspection personnel.

a) The procedure should ensure that inspection personnel are familiar with the applicable regulations and are proficient at inspecting the articles they are assigned to inspect.

b) Testing, formal training, recurrent training, or a combination of these methods could be used to maintain the proficiency of inspection personnel.

11) Establishing and maintaining current technical data for maintaining articles.

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12) Revising the repair station's quality manual and notifying its CHDO of revisions to the manual, including how often the FAA will be notified of revisions. The procedure must include:

- The title of the person authorized to make a revision;
- The method of submitting revisions (electronic, hardcopy, disk, etc.); and
- A procedure for recording revisions and a system for identifying revised material or text.

13) Qualifying and surveying noncertificated persons who perform maintenance, preventive maintenance, or alterations for the repair station. A certificated repair station may contract a maintenance function pertaining to an article to a noncertificated person, provided that:

- The noncertificated person follows a QC system equivalent to the system followed by the certificated repair station;
- The certificated repair station remains directly in charge of the work performed by the noncertificated person;
- The certificated repair station verifies, by testing and/or inspecting, that the work has been performed satisfactorily and that the article is Airworthy before approving it for return to service; and
- The noncertificated person's contract allows the FAA to inspect or observe work being performed on any articles for the certificated repair station.

NOTE: The ability to inspect a noncertificated person can only be accomplished while the contract is in force. This requirement does not give ASIs access to non-FAA-certificated facilities if there is no work being performed under contract for a certificated repair station.

B. Manual References. Where applicable, the manual should contain references to the instructions for continued airworthiness (ICA), maintenance manuals, inspection standards, or other approved or accepted data specific to the article being maintained.

C. Inspection and Maintenance Forms. A sample of each of the inspection and maintenance forms used in the performance of maintenance and the instructions for completing those forms.

NOTE: These forms may be addressed in a separate accepted manual that is submitted to the CHDO and maintained in current condition by the repair station.

2-1299 TASK OUTCOMES.

A. Complete PTRS Records.

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B. Complete the Task. Completion of this task will result in the following actions:

- If no regulatory conflicts were found, the FSDO may send a transmittal document acknowledging receipt of the manuals.
- If conflicts with the rule are noted, the PI will detail those discrepancies in writing to the certificate holder.

NOTE: ASIs may inform the certificate holder that no deficiencies were noted. This should not be mistaken as an "acceptance" of the manuals.

NOTE: Federal agencies can no longer refuse electronic versions of manuals, forms, record systems, etc. Federal law prohibits agencies from making the use of electronic media more difficult, or from requiring additional steps or procedures for users of electronic media. Therefore, all repair station document submissions must be accompanied by a transmittal document that describes the submission and is signed by the appropriate manager.

1) Approve the training program or a revision by sending the certificate holder a letter indicating the date; document, manual, or revision number; and an approval statement. The PI should sign the transmittal document.

2) Accept the Canadian supplement or revision to the appropriate manual sections by sending the certificate holder a letter indicating the date; document, manual, or revision number; and an acceptance statement. The ASI should sign the transmittal document. If the repair station elects to imbed their Canadian MIP requirements in their manual, the acceptance conveyance letter must quote each section of the manual where the Canadian requirements are found. The ASI is only accepting the Canadian requirements of the manual.

NOTE: A certificate holder using electronic media such as CD-ROM disks, local area network (LAN)-based manual systems, or internet-based manual systems may scan the cover letters and insert them electronically into the applicable document if they do not wish to maintain a file of acceptance or approval letters.

C. Use of Electronic Transmissions (Email or Facsimile). Email or fax responses are an acceptable alternative to the cover letter if the repair station is equipped to transmit and receive any necessary attachments; this may include the use of electronic signatures. This method should be addressed in the repair station's procedures and found acceptable to the FAA.

D. Rejection. Reject the manual(s) or revisions by doing the following:

1) Initiate a cover letter indicating the date and document, manual, or revision number of the document or manual being rejected.

2) Return all copies to the applicant with an explanation of discrepancies that must be corrected and instructions for resubmitting the documents in order to proceed with the certification or revision process.

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E. Posting Revisions. The applicant/certificate holder must provide revisions to the RSM and/or QCM, and the approved training program and/or manual, to the CHDO. The PI will file the revision in the certificate holder/applicant's office file.

1) If in a paper revision, the ASI will remove the affected pages and insert the revised pages in the manuals or the training program. The ASI will update the manual control system and file the cover letters in the appropriate office file.

2) If in an electronic format, the ASI will replace the outdated office copy version with the current submission in the format it was submitted.

F. Document the Task. File all supporting documents in the certificate holder/applicant's office file.

2-1300 FUTURE ACTIVITIES. None.

RESERVED. Paragraphs 2-1301 through 2-1315.

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VOLUME 2 AIR OPERATOR AND AIR AGENCY CERTIFICATION AND APPLICATION PROCESS

CHAPTER 11 CERTIFICATION OF A TITLE 14 CFR PART 145 REPAIR STATION

Section 5 Evaluate Part 145 Repair Station Facilities and Equipment

2-1316 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.

A. Maintenance: 3378.

B. Avionics: 5378.

2-1317 OBJECTIVE. This section provides evaluation and inspection guidance for a Title 14 of the Code of Federal Regulations (14 CFR) part 145 repair station for original certification, change in rating, change in location, or adding facilities.

2-1318 GENERAL.

A. When determining the suitability of permanent housing or other facilities used for the maintenance of an aeronautical article, the inspector should consider climatic conditions. This is to determine if high or low temperatures, excessive dust or sand, or other conditions will adversely affect worker efficiency. The inspector should also consider the maintenance being performed to determine if work processes are adversely affected by environmental conditions.

B. Applications for a repair station certificate, amendment to, transfer of, or an additional rating must be made in a format acceptable to the Federal Aviation Administration (FAA) and conform to the requirements of part 145. Additional guidance for the certification and operation of a part 145 repair stations may be found in other chapters of this order as well as the current edition of Advisory Circular (AC) 145-9, Guide for Developing and Evaluating Repair Station and Quality Control Manuals.

2-1319 SATELLITE REPAIR STATION INSPECTION.

A. A certificated repair station may apply for additional facilities or locations to become satellites of the repair station with managerial control. If practical, the satellite repair station may use all or portions of the managerial repair station's manuals to develop its own manuals. Each satellite must satisfy all requirements of part 145 for each rating sought. Ratings for the satellite may not exceed the rating of the managerial repair station.

1) Personnel and equipment from the repair station with managerial control and each certificated satellite repair station under its control may be shared.

NOTE: Procedures must be included in the manual to describe how tools will be recalibrated or removed from service if calibration is compromised during their transport between facilities.

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2) Inspection personnel must be designated for each satellite repair station and be available at the repair station anytime a determination of airworthiness or return to service is made. In other circumstances, inspection personnel may be away from the premises but must be available by telephone, radio, or other electronic means.

3) The satellite repair station may not hold a rating that is not held by the certificated repair station with managerial control.

4) The satellite repair station must be located in the same domicile country as the certificated repair station with managerial control.

B. A satellite facility inspection is conducted in the same manner as a repair station facility inspection.

2-1320 REPAIR STATION INSPECTION.

NOTE: The following procedures apply to all repair stations regardless of their geographic location.

A. Each certificated repair station must provide the following:

1) Housing for the facilities, equipment, materials, and personnel consistent with its ratings.

2) Facilities for properly performing the maintenance, preventive maintenance, or alterations of articles, or the specialized services for which it is rated. Facilities must include the following:

a) Sufficient work space and areas for the proper segregation and protection of articles during all maintenance, preventive maintenance, or alterations;

b) Segregated work areas enabling environmentally hazardous or sensitive operations such as painting, cleaning, welding, avionics work, electronic work, and machining to be done properly and in a manner that does not adversely affect other maintenance or alteration articles or alterations;

c) Suitable racks, hoists, trays, stands, and other segregation means for the storage and protection of all articles undergoing maintenance, preventive maintenance, or alteration;

d) Space sufficient to segregate articles and materials stocked for installation from those articles undergoing maintenance, preventive maintenance, or alteration; and

e) Ventilation, lighting, and control of temperature, humidity, and other climatic conditions sufficient to ensure personnel perform maintenance, preventive maintenance, or alterations to the standards required by this part.

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B. A certificated repair station with an airframe rating must provide suitable permanent housing to enclose the largest type and model of aircraft listed on its operations specifications (OpSpecs).

NOTE: Each certificated repair station must have a fixed location where materials, equipment, tools, and data are stored. While consideration can be given for certain operating situations, aviation safety inspectors (ASI) must not authorize "virtual" or completely "mobile" repair stations. Even though the majority of the work is done away from the fixed location, each repair station must have a permanent, fixed base from which it operates the repair station.

1) ASIs should evaluate the housing needs of the repair station based upon the depth and complexity of the work the repair station will perform. For example, if an airframe-rated repair station will only be doing interior refurbishment or interior electrical work that does not require the aircraft to be completely housed, a nose dock or other similar housing may suffice for the housing requirement. Any work done on removed aircraft components must be accomplished in an appropriate housing, back shop, or other permanent structure.

2) Repair stations that frequently work away from their fixed location must ensure another certificate holder's housing and facilities are adequate and meet the requirements of the regulations for the ratings that they hold. Procedures should be included in their manuals that describe how they will evaluate a certificate holder's facilities prior to performing maintenance under the privileges of their certificate at the facility.

3) Some repair stations, such as internal fuel tank repair stations, do not require housing that will enclose the largest aircraft listed on their OpSpecs. Most of this type of work is performed in the aircraft wing, and protection from the elements should not be a major consideration. The use of mobile coverings to protect articles being installed or removed from the wing should provide sufficient protection from the elements.

C. A certificated repair station may perform those maintenance functions for which it is rated on articles outside of its housing if it provides suitable facilities that are acceptable to the FAA. The facility must meet the requirements of § 145.103(a), and the work must be done in accordance with the requirements of part 43 of this chapter.

D. A certificated repair station may perform maintenance, preventive maintenance, or alterations for the following certificated operators or carriers:

1) A 14 CFR part 121 or part 135 air carrier or commercial operator that has a continuous airworthiness maintenance program and the repair station must follow their program and applicable sections of their maintenance manual.

2) A 14 CFR part 125 operators and the repair station must follow the operator's FAA-approved inspection program.

3) A foreign air carrier or foreign person operating a U.S.-registered aircraft and the repair station must follow the operator's FAA-approved maintenance/inspection program.

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E. A certificated repair station may be authorized to perform line maintenance for an air carrier certificated under part 121 or 135, a foreign air carrier, or a foreign person operating a U.S.-registered aircraft in common carriage under 14 CFR part 129, provided:

1) The repair station performs such line maintenance in accordance with the operator's manual and approved maintenance program;

2) The repair station has the necessary equipment, trained personnel, and technical data to perform such line maintenance; and

3) The repair station OpSpecs includes an authorization to perform line maintenance.

NOTE: All certificated repair stations must have suitable permanent housing and facilities. Although § 145.205(d) allows some deviation from the housing requirement, that requirement is based upon the repair station having suitable housing at another location that meets the requirements of part 145. If line maintenance is the only maintenance a repair station is certificated to perform, the repair station must still meet the housing and all other applicable requirements of part 145. Housing need not be on the airport where the line maintenance is performed, but the street address must be listed on the repair station OpSpecs.

F. A repair station may have the need to perform maintenance away from its permanent fixed base of operation. This requirement may be necessary due to a special circumstance, as determined by the FAA, or may be recurring based on a repair station's need. Such work may include, but not be limited to:

- Aircraft recovery;
- Biennial testing of systems on aircraft operating under Instrument Flight Rules (IFR);
- Fuel cell maintenance;
- Nondestructive Testing (NDT) inspections; and
- Interior modifications.

1) A repair station performing maintenance away from its fixed location may transport the materials, equipment, and technical personnel to the aircraft location or facility to facilitate the required maintenance.

2) At no time while performing work away from its fixed base will the work scope exceed the capabilities for which the repair station is rated.

3) A repair station that performs maintenance functions away from its fixed location on a recurring basis must ensure the temporary facility it uses meets the requirements of § 145.103(a).

4) The repair station must ensure that its repair station manual includes the procedures for accomplishing maintenance, preventive maintenance, alterations, or specialized services at a place other than the repair station's fixed location.

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G. A repair station may need to perform maintenance at multiple fixed locations (i.e., additional facilities/localized within a defined area).

1) A repair station does not require a geographic authorization or satellite certificate if it is seeking to work at another site within a localized area. A localized area may be defined as several buildings or hangars, which may be on or near an airport or at or near the primary fixed base address as stated on the repair station OpSpecs. Repair stations using multiple fixed locations under a single air agency certificate need not have all the tools, equipment, data, or personnel at each location. The repair station's primary fixed base and any additional fixed locations are considered a single repair station. Each facility address must be listed in the repair station OpSpecs. This situation is not considered work away from the station.

2) The repair station manual must incorporate procedures that reflect how the repair station will meet the requirements of part 145 at each of its facilities. The procedures must include any supplemental operations (i.e., movement of articles, equipment, or tools required to perform the work) that may affect the repair station's ability to ensure the airworthiness of the articles maintained by the repair station. The repair station remains directly in charge of the work performed at all fixed locations.

3) All fixed location addresses must be listed on the repair station's OpSpecs. The repair station must submit a written request/application to use additional locations prior to exercising the privileges of its certificate and ratings at the additional fixed locations. The FAA must inspect and approve each location and update the OpSpecs with the address for each additional location.

4) There also may be instances where an engine test cell facility is located away from the primary facility but operates under the same certificate as the primary facility. This may occur when:

a) The FAA determines that the separate locations do not have any significant impact on the maintenance performed, and the separate locations are under the full control of the primary facility; and

b) The separate facilities must be in a defined area relative to the primary facility, and located within the same country. An FAA inspector must be able to use ground transportation to get from one facility to another without major expense or inconvenience.

5) OpSpec A101 must contain the address of all of the repair station's additional fixed locations.

2-1321 COORDINATION REQUIREMENTS. This task may require coordination with another specialty or district office, and the certificated repair station.

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2-1322 REFERENCES, FORMS, AND JOB AIDS.

A. References:

- Title 14 CFR Parts 43, 65, 91, 121, 125, and 135.
- AC 145-9, Guide for Developing and Evaluating Repair Station and Quality Control Manuals.
- Volume 2, Chapter 11, Section 1, Introduction.
- Volume 2, Chapter 11, Section 2, Procedures for Certificating Part 145 Repair Stations/Satellites Located Within the United States and Its Territories.
- Volume 2, Chapter 11, Section 3, International Field Office Procedures for Certificating/Renewing/Amending a Part 145 Repair Station Located Outside the United States and its Territories and not Under a Maintenance Implementation Procedure.
- Volume 2, Chapter 11, Section 4, Evaluate a Part 145 Repair Station Manual and Quality Control Manual or Revision.
- Volume 6, Chapter 11, Section 20, Evaluate Special Equipment or Test Apparatus.

B. Forms. FAA Form 8310-3, Application for Repair Station Certificate and/or Rating.

C. Job Aids. None.

2-1323 PROCEDURES.

A. Review Documentation. Review the Repair Station Certificate Manuals/Revision, Capabilities Listing, and OpSpecs for accuracy to determine that ratings are appropriate for work being performed, for accuracy. Also determine if maintenance functions will be contracted out, and contracted persons will meet the requirements of § 145.217.

B. Evaluate the Housing and Facilities. Inspect the following:

1) Housing and shop areas to ensure the following:

a) Adequate housing includes sufficient workspace for maintenance functions to be accomplished.

b) If a repair station holds an airframe class rating or limited airframe (specific model aircraft) rating, that housing includes suitable permanent housing for the largest type and model aircraft listed on its OpSpecs.

NOTE: If climatic conditions allow, the repair station may perform maintenance, preventive maintenance, or alterations outside of its housing if these facilities are acceptable to the FAA and meet the requirements of § 145.103(a).

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c) Proper storage and protection of:

- Materials,
- Parts, and
- Supplies.

d) Proper identification and protection of parts and subassemblies during:

- Disassembly,
- Cleaning,
- Inspection,
- Repair,
- Alteration, and
- Assembly.

e) Segregation of the following:

- Incompatible work areas (e.g., metal shop, battery charging area, or painting area next to an assembly area);
- Unpartitioned parts cleaning areas; and
- Articles and materials stocked for installation from those articles undergoing maintenance or alteration.

f) Proper ventilation, lighting, and temperature and humidity for the type and complexity of work being accomplished.

2) Technical documents to ensure that they are current and accessible when relevant work is being performed:

- Airworthiness Directives (AD),
- Instructions for continued airworthiness (ICA),
- Maintenance manuals,
- Overhaul manuals,
- Standard practice manuals,
- Service Bulletins (SB), and
- Other applicable data acceptable to or approved by the FAA.

3) Equipment, tools, and test equipment, to ensure:

a) Required types and quantities are available and under the control of the repair station during performance of the work function.

b) All test and inspection equipment and tools used to make airworthiness determinations are calibrated to a standard acceptable to the FAA.

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NOTE: The part 145 rule states that tooling is calibrated to a standard acceptable to the Administrator. That may be a standard derived from the National Institute of Standards and Technology (NIST), or a standard provided by the equipment manufacturer. International agreements may also be accepted as a means of compliance. A list of international agreements referred to as Memorandum of Understanding (MOU) or Mutual Recognition Agreement (MRA) may be accessed from the NIST Web site (http://www.nist.gov). Also, the National Voluntary Laboratory Accreditation Program (NVLAP) provides third-party accreditation to testing and calibration laboratories. NVLAP's accreditation programs are established in response to Congressional mandates, administrative actions by the Federal government, or requests by private-sector organizations. NVLAP is in full conformance with the standards of the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC), including ISO/IEC 17025 and Guide 58. NVLAP identifies its accredited laboratories in a published directory, NIST Special Publication 810, which is published on the NIST Web site. Additionally, for foreign equipment, the standard of the country of manufacture may be used if approved by the Administrator. An Exemption Authorization is required if a repair station uses equipment of a foreign manufacturer and the method of calibration it will use is not addressed through a MOU or MRA, or the FAA inspector cannot obtain the validity of the Calibration Laboratory. Exemption authorizations are granted through the issuance of an exemption per 14 CFR part 11 guidance. Currently, exemptions of this type are issued for a 2-year period and can be renewed if requested by the repair station.

c) A repair station may substitute manufacturers' tooling with one that is of its equivalent. If the repair station uses equivalent tooling it is responsible for the determination of equivalency. The repair station must provide a means to the FAA that will demonstrate that the tool meets the manufacturer's standards and specifications with all respects regarding tolerances and accuracy.

1. The special equipment or test apparatus must be capable of performing all normal tests and checking all parameters of the equipment (article) under test. The level of accuracy should be equal or better than that recommended by the manufacturer.

2. The equivalency can only be made based upon an evaluation of a technical data file. The repair station will establish a technical data file for each piece of equivalent tooling. The file will contain, but is not limited to, data, drawings, specifications, instructions, photographs, templates, certificates, and reports.

a. In the case of calibration equipment, the technical data file should also include data sheets attesting to the accuracy when calibration standards are necessary, as well as any special manufacturing processes that are used, including gauges and recording equipment in the controlling process.

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b. If calibration equipment is involved, adequacy of that calibration system shall be established with documented procedures to evaluate the adequacy of that calibration equipment and its traceability to one of the previously listed standards.

3. A demonstration of the functionality of the special equipment or test apparatus may be necessary to determine its equivalency.

NOTE: Designated Engineering Representatives (DER) may not approve or determine equivalency of tooling and test equipment. Furthermore, neither the FAA nor a DER may approve equipment and/or test apparatus. The FAA and DERs may only make an acceptance of functional equivalency for special equipment or test apparatus. It is important to emphasize that the burden of demonstrating equivalency is borne by the repair station and not the FAA.

C. Analyze Findings. If deficiencies were found, meet with the certificate holder to discuss possible corrective actions.

2-1324 TASK OUTCOMES.

A. Complete the PTRS Record.

B. Complete the Task. Completion of this task will result in one of the following:

1) If the facilities were found acceptable:

- Insert an entry into the PTRS stating satisfactory/or entries in the comment section; and
- Provide a letter to the repair station acknowledging the successful completion of the inspection (optional).

2) If the facilities were found unacceptable:

- The focus of the Flight Standard Service (AFS) workforce should be to collaborate with the parties involved on correctly identifying and fixing the root cause(s) of deviations or noncompliance;
- Provide a letter describing any deficiencies that must be corrected;
- See Volume 14, Chapter 1, Sections 1 and 2, to determine the most appropriate course of action to correct deviations from regulatory requirements; and
- Conduct a followup evaluation to ensure that the repair station is in compliance with regulations.

C. Document the Task. File all supporting paperwork in the certificated repair station's office file.

2-1325 FUTURE ACTIVITIES. Perform followup inspection, as appropriate.

RESERVED. Paragraphs 2-1326 through 2-1340.

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VOLUME 2 AIR OPERATOR AND AIR AGENCY CERTIFICATION AND APPLICATION PROCESS

CHAPTER 11 CERTIFICATION OF A TITLE 14 CFR PART 145 REPAIR STATION

Section 6 Part 145 Repair Station Located in the U.S. Applying for an EASA Part-145 Initial, Renewal, and Amendment Approval

2-1341 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.

A. Maintenance: 3377, 3669, and 3771.

B. Avionics: 5377, 5669, and 5771.

2-1342 OBJECTIVE. This section guides aviation safety inspectors (ASI) on how to certificate a Title 14 of the Code of Federal Regulations (14 CFR) part 145 repair station, located in the United States, that is applying for a European Aviation Safety Agency (EASA) Part-145 approval. ASIs must use this section in conjunction with the Maintenance Annex Guidance (MAG). However, the MAG supersedes this section if conflicts exist between the two documents.

2-1343 BACKGROUND.

A. United States/European Union (EU) Aviation Safety Agreement.

1) The Agreement signed on June 30, 2008 is between the United States and the EU to cooperate in the regulation of civil aviation safety. The Agreement's official title is "Agreement Between the United States of America and the European Community on Cooperation in the Regulation of Civil Aviation Safety." The Agreement contains two annexes. Annex 1 pertains to airworthiness and environmental certification, while Annex 2 pertains to maintenance. This section focuses on Annex 2.

2) The Agreement allows the Federal Aviation Administration (FAA) and EASA to rely on each other's surveillance systems, minimize the duplication of efforts, increase efficiency, and conserve resources to the greatest extent possible. The Agreement calls for successful completion of regularly scheduled FAA inspections. The FAA and EASA must be satisfied that repair stations located in the United States and EU-based Approved Maintenance Organizations (AMO) meet the conditions of Annex 2.

3) Annex 2 of the Agreement allows EASA and the FAA to accept each other's standards, systems, and approvals relating to repair stations located in the United States and EU-based AMOs that maintain civil aviation products. Annex 2 also explains how to establish points of communication and cooperation when urgent or unusual situations develop.

B. MAG. The MAG is the general term for the document's official title, which is "Maintenance Annex Guidance Between the Federal Aviation Administration for the United States of America and the European Aviation Safety Agency for the European Union."

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The MAG, which is a separate document from the Agreement, explains how to implement the Agreement and its Annex 2.

NOTE: Both the MAG and the Agreement are located at: http://www.faa.gov/aircraft/repair.

2-1344 INITIAL/AMENDMENT—PREREQUISITES AND COORDINATION REQUIREMENTS.

A. Prerequisites:

- Knowledge of the regulatory requirements of 14 CFR parts 43 and 145;
- Knowledge of the MAG requirements;
- Successful completion of the Airworthiness Inspector Indoctrination course(s) or equivalent;
- Successful completion of FAA training course 21058, Certification and Surveillance of Part 145 Stations or equivalent;
- Successful completion of Web-based training course 27100066, Understanding the U.S./EU Aviation Safety Agreement for Maintenance; and
- Previous experience with certification or surveillance of part 145 repair stations.

B. Coordination. This task requires coordination with the following:

- Applicant repair station;
- Applicant repair station's ASI. This could include the principal maintenance inspector (PMI) or principal avionics inspector (PAI);
- EASA;
- FAA regional EASA coordinator; and
- FAA Regional Offices (RO) and district offices, as appropriate.

2-1345 INITIAL/AMENDMENT—REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Title 14 CFR Parts 43 and 145.
- Agreement Between the United States of America and the European Community on Cooperation in the Regulation of Civil Aviation Safety (the Agreement).
- Maintenance Annex Guidance Between the Federal Aviation Administration for the United States of America and the European Aviation Safety Agency for the European Union (the MAG).
- Volume 2, Chapter 11, Section 1, Introduction.
- Volume 2, Chapter 11, Section 2, Procedures for Certificating Part 145 Repair Stations/Satellites Located Within the United States and Its Territories.
- Volume 2, Chapter 11, Section 4, Evaluate a Part 145 Repair Station Manual and Quality Control Manual or Revision.

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B. Forms:

- FAA Form 8000-4, Air Agency Certificate.
- FAA Form 8000-4-1, Repair Station Operations Specifications.
- EASA Form 1, Authorised Release Certificate.
- EASA Form 3, Maintenance Organisation Approval Certificate.
- EASA Form 9, FAA Recommendation.
- EASA Form 16, Application Form.

NOTE: Access EASA Part-145 documents and forms at http://easa.europa.eu/easa-and-you/aircraft-products/continuing-airworthiness-organisations/foreign-part-145-organisations-in-us.

C. Job Aids. The MAG includes job aids as appendices.

2-1346 INITIAL/AMENDMENT CERTIFICATION, DOCUMENT REVIEW, AND PREPARATION.

A. Receipt of Preliminary Inquiry. Upon receiving a preliminary inquiry from a repair station applying for initial EASA Part-145 approval, the ASI should follow the process and procedures contained in this section and the MAG, section B. The ASI should also inform the FAA regional EASA coordinator of the initial contact.

B. Line Stations. EASA uses the term “line stations” while the FAA uses the term “line maintenance authorization” in relation to part 145. This is to advise the ASI that these terms are synonymous when applied under the terms of the Agreement. The EASA certificate shall only cover line stations under the surveillance of the FAA, except those located in one of the EU Member States.

C. Fees. The repair station will comply with EASA fees and charges regulation found at http://easa.europa.eu/easa-and-you/aircraft-products/continuing-airworthiness-organisations/foreign-part-145-organisations-in-us.

D. MAG Forms and Accessibility. The MAG contains EASA Form 9, EASA Form 16, and surveillance information to complete the task. The forms are also available on the EASA Web site. (See the EASA Web site address in paragraph 2-1343.)

E. Prerequisite for Applicants. A repair station seeking approval under EASA Part-145 must hold a valid repair station certificate issued under part 145 and be located in the United States and its territories. A repair station may not apply concurrently for a repair station certificate and EASA approval.

F. Evidence of Need. The repair station must submit written confirmation of the need for an EASA Part-145 approval. This may be in the form of a letter of intent (LOI), a work order, or a contract with details of the relevant customer. A relevant customer may be an EASA Part-145 AMO, a European operator, or a distributor (refer to the MAG, section B, part I, paragraph 2.1).

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G. EASA Supplement Requirements. Before inspecting the facility, the ASI must first review the submitted repair station's EASA supplement to ensure the supplement meets the requirements in the MAG, section B and the sample supplement (see Volume 12, Chapter 8, Section 1). The ASI accepts the supplement in the same manner as the FAA accepts the Repair Station Manual (RSM)/Quality Control Manual (QCM).

H. Reasons for Amendments. Per the MAG, section B, part III, an EASA certificate must be re-issued when a repair station changes the following:

- Name, including doing business as (DBA) names;
- Address of the approved facility (not including the mailing address); and
- Repair station number.

I. Unimpeded Access. For the purposes of surveillance and inspection, the FAA and EASA (and aviation authorities (AA)) will help each other gain unimpeded access to repair stations/AMOs subject to its jurisdiction. It is incumbent upon the repair station/AMO to provide unimpeded access to EASA and the FAA to all work areas having civil aviation application. The repair station/AMO should ensure that, where possible, there is clear delineation between work areas with civil and military applications within the repair station/AMO.

J. Exchange of Safety Data. Article 9 of the Agreement stipulates that the FAA and EASA will provide each other, on request and in a timely manner, with any information regarding accidents/incidents involving civilian aeronautical products or regulated entities, and to exchange other safety information. Per the Agreement, the FAA agrees to share Safety Performance Analysis System (SPAS) data with EASA that is restricted to:

- The repair station's profile (attached to EASA Form 9); and
- Information documented in PTRS related to repair station findings on EASA Form 9. (EASA Form 9 is used during certification, amendment, or renewal of a repair station located in the United States that is seeking or has received EASA approval.)

2-1347 INITIAL/AMENDMENT—DEMONSTRATION AND INSPECTION PHASE.

A. Review for Initial Approval.

1) The ASI will inspect the repair station for compliance with parts 43 and 145 and the EASA supplement. If an ASI has inspected the repair station within the past 6 months, he or she is not required to re-inspect it for compliance with parts 43 and 145.

2) The ASI must review the repair station's compliance with those items specified on EASA Form 9, as applicable.

3) The ASI will also perform the following:

a) Confirm that the repair station's EASA supplement is available throughout the facility.

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b) Verify that the repair station has established an effective internal quality audit system, has established a schedule to perform the audit, and has corrected any findings or discrepancies identified. An ASI accomplishes an initial inspection by reviewing the EASA manual supplement and ensuring the internal quality system meets the requirements of the MAG, section B.

c) If the repair station holds a D107 operations specification (OpSpec) for line maintenance authorization, verify, as applicable, that the EASA supplement lists each EASA location, including make, model of aircraft, and European customer. (The repair station's internal quality system/internal quality audit system includes line stations, as applicable.) ASIs accomplish this by reviewing records of the quality monitoring system/internal quality audit system (refer to the MAG, section B for requirements). However, ASIs should be aware that if the office is unable to provide proper surveillance of the line station's locations outside its geographic boundaries or unable to delegate the surveillance to another office, they should consult with the RO for additional options before rejecting the supplement or revision.

NOTE: Be advised that the FAA cannot include foreign-registered aircraft types on FAA OpSpec D107. Under the Agreement, the EASA supplement will list these aircraft types.

4) When reviewing the findings of the repair station's internal quality system/internal quality audit findings, the ASI should regard the findings as a self-disclosure and should not process violations on these findings. The ASI should recommend to the repair station that it submit the identified findings per FAA voluntary disclosure procedures. EASA recognizes the FAA self-disclosure process when the repair station meets the guidance provided in the current edition of Advisory Circular (AC) 00-58, Voluntary Disclosure Reporting Program. Freedom of Information Act (FOIA) restrictions would not apply in the case of EASA receiving notification of the corrective action plan (CAP) because the findings may directly impact the repair station's certificate. The ASI should complete EASA Form 9 to identify the findings and attach the CAP.

B. Inspect Repair Stations Seeking Amendment. Depending on the nature of the proposed amendment, the FAA may need to perform a limited inspection of the repair station seeking an amendment.

C. Analyze and Document Any Deficiencies.

1) If deficiencies are noted, the ASI must brief an appropriate representative of the repair station at the end of the inspection, confirm any findings, notify the repair station in writing, and, if appropriate, meet with the repair station to review the deficiencies in detail.

a) For an initial application, the repair station must correct all deficiencies noted by the ASI, per the MAG, section B, part I, paragraph 3.9.

b) If the repair station has a noncompliance concerning parts 43 and 145, the ASI will advise EASA of the issues and the associated FAA action with EASA Form 9, but the ASI cannot withhold a positive recommendation. The final decision for EASA approval lies with the EASA.

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2) The repair station must notify the ASI when it has corrected all deficiencies. The ASI must document and record each deficiency and corrective action in the repair station's certification file. The ASI must notify the FAA regional EASA coordinator of:

- All deficiencies that the repair station has not corrected;
- Any problems that may deny initial EASA approval;
- Any issues that require consultation with the EASA; or
- Any other actions the repair station must coordinate with the EASA.

NOTE: ASIs should coordinate all nonrecommendations for EASA approval (initial/renewal/amendment) with the FAA regional EASA coordinator, who should act as the point of contact (POC) between the FAA and EASA.

2-1348 INITIAL/AMENDMENT—EASA APPROVAL. To recommend EASA Part-145 approval of a repair station, the ASI should be satisfied with the proposed EASA supplement, any amendments (if applicable), evidence of need, the EASA Form 16 application (in accordance with the MAG, section B), and any inspections the FAA has performed. The ASI will recommend acceptance of the repair station to the EASA by preparing EASA Form 9. Refer to the MAG, section B, appendix 3 for details and completion instructions.

A. Prepare EASA Form 9.

1) On EASA Form 9, ASIs must check each block "Yes," "No," or "N/A," as applicable.

NOTE: The principal inspector (PI) should check "Yes" in the last block of the EASA supplement status indicating the FAA has accepted the EASA supplement.

2) For an initial certification and only after the repair station corrects all its findings/discrepancies, the ASI must forward to EASA the following:

- EASA Form 9. (For initial certification, complete Form 9 for the main facility, and for each additional fixed location, and line station under this approval. For renewal and amendment, complete only one Form 9 that includes line items 1 and 2 as seen in the MAG, section B, appendix 3.);
- A copy of the repair station profile from SPAS (attached to EASA Form 9); and
- Any accompanying material.

3) ASIs must not use a pending compliance and/or enforcement action to delay submitting EASA Form 9 with a nonrecommendation.

B. Process the Recommendation for EASA Part-145 Approval. Follow the process and procedures contained in the MAG, section B, part I, paragraph 3.10.

NOTE: The ASI may email the certification package to the EASA at foreign145@easa.europa.eu.

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C. Receive a Copy of EASA Part-145 Approval. EASA will follow the process and procedures contained in the MAG, section B, part I, paragraph 4. The FAA regional EASA coordinator will forward a copy to the appropriate ASI for the office records.

2-1349 INITIAL/AMENDMENT—TASK OUTCOMES.

A. Complete the PTRS Record. The ASI will complete the PTRS record as needed.

B. Complete the Task. Completion of the task will result in the following action.

1) Once EASA issues the EASA Part-145 certificate to the repair station, the ASI will:

a) Revise OpSpec A001, Issuance and Applicability, of a new repair station's OpSpecs to include the following (or equivalent) language: "The repair station specified on these OpSpecs is performing maintenance and/or alteration of aircraft and/or aeronautical products to be installed on aircraft under the terms and conditions of the U.S./EU Safety Agreement and associated Annex 2."

b) Update the enhanced Vital Information Database (eVID) by completing all relevant data fields to indicate that the repair station is EASA-approved.

c) Return one copy of the EASA supplement to the repair station.

d) File a copy of the EASA supplement, a copy of the evidence of need document, EASA Form 16, and EASA Form 9 in the repair station's file.

2) For a repair station that terminated the process or failed an inspection, the ASI will return to the repair station all copies of the EASA supplement and EASA Form 16 with a letter explaining all deficiencies.

C. Document the Task. File all supporting paperwork in the repair station's file and add EASA supplement aspects to all future FAA inspections of the repair station's facility. A copy of the applicant's EASA supplement, together with its part 145 RSM/QCM, will be maintained at the FSDO.

NOTE: The EASA does not require a copy of either the repair station's manual or EASA supplement.

2-1350 INITIAL/AMENDMENT—FUTURE ACTIVITIES. When the EASA Part-145 approval process is complete, the ASI must revise surveillance planning and scheduling for the repair station to include surveillance and inspections for compliance with part 145 and EASA special conditions. The ASI should coordinate FAA facility inspections to accomplish EASA renewal facility inspections.

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2-1351 SIGNIFICANT FINDINGS AND ENFORCEMENT ACTION.

A. Reporting Findings on EASA Form 9. The ASI will use EASA Form 9 to report any changes to the status of the repair station part 145 certificate (such as surrender, suspension, or revocation) and any serious failure of the repair station to comply with part 145 that could result in certificate action. To report uncorrected findings or discrepancies, the ASI will leave the "date closed" column blank. Revocation of a repair station's part 145 certificate automatically invalidates its EASA approval.

1) For recommendations, refer to the MAG, section B, part II, paragraph 5.3.

2) For nonrecommendations, refer to the MAG, section B, part II, paragraph 5.4.

NOTE: Withdrawal of FAA certification will result in the withdrawal of EASA approval since EASA certification is based on compliance with part 145 and EASA special conditions. The Agreement obligates the FAA to inform the EASA of findings, which allows the EASA to determine what action to take.

B. Compliance and Enforcement Actions. ASIs are still responsible for processing the most appropriate action in accordance with Volume 14, Chapter 1, Sections 1 and 2, to correct deviations from part 145 regulatory requirements, even if they notify the EASA of the noncompliance. An ASI, however, cannot process compliance or enforcement action if the basis for the action is a deviation from EASA special conditions, but not a noncompliance of part 145.

2-1352 RENEWAL APPROVAL—PREREQUISITES AND COORDINATION REQUIREMENTS. See paragraph 2-1344.

2-1353 RENEWAL APPROVAL—REFERENCES, FORMS, AND JOB AIDS. See paragraph 2-1345.

2-1354 RENEWAL APPROVAL—EASA PART-145 RENEWAL APPROVAL PROCESS. The MAG, section B, part II contains the procedures for the EASA Part-145 renewal.

2-1355 RENEWAL APPROVAL—DOCUMENT COMPLIANCE PHASE.

A. Review Completed EASA Form 16. The ASI should verify that the repair station has submitted a completed EASA Form 16. Guidance for evaluating an EASA supplement is in the MAG, section B, appendix 1. The evidence of need may be an LOI, contract, or work order from an EASA AMO, European operator, or a distributor.

NOTE: The repair station must submit to the ASI for review and acceptance any revisions to its EASA supplement that reflect changed procedures but do not change the nature of its EASA Part-145 approval. Once the repair station has submitted the revision to the FAA, it may implement the revision unless notified otherwise by the FAA. Submission of EASA Form 16 is not required for such revisions.

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B. FSDO Copy of EASA Form 3 Approval Certificate. ASIs should ensure that the repair station provides them a copy of the EASA Form 3 approval certificate once the repair station receives it from EASA.

2-1356 RENEWAL APPROVAL—DEMONSTRATION AND INSPECTION PHASE.

A. Review/Inspect the Repair Station for EASA Renewal Approval. Refer to the MAG, section B, part II for the process and procedures for EASA renewal approval. In addition, the ASI should complete the following tasks:

1) Inspect the repair station for compliance with parts 43 and 145 and the EASA supplement. ASIs may accomplish this when they complete their normal annual work program.

2) Review the repair station's compliance with those items specified on EASA Form 9.

3) Confirm that the repair station EASA supplement is available throughout the facility.

4) Confirm whether the repair station has performed any work for an EASA customer since the last inspection. If the repair station has performed or is currently performing work for an EASA customer, the ASI will verify the following:

a) Relevant maintenance records are clear and complete.

b) Hangar space is available for base maintenance. A repair station may perform line maintenance, per the MAG, section B.

c) The repair station has an independent quality monitoring system.

d) If the repair station holds a D107 OpSpec for line maintenance authorization, verify, as applicable, that the EASA supplement lists each EASA location, including make and model of aircraft and European customer. (Line stations, as applicable, are included in the repair station's independent quality monitoring system.) The ASI should review audit records to verify that the repair station has performed audits of its EASA-accepted line stations as identified in the EASA supplement.

e) Submit to the EASA, on EASA Form 9, any findings documented under an ASI's review of the repair station's independent quality monitoring system or findings under the repair station's self-disclosure process (refer to AC 00-58).

B. Analyze and Document Any Deficiencies.

1) If the ASI notes deficiencies, he or she will brief an appropriate representative of the repair station at the end of the inspection and confirm any findings in writing within 2 weeks.

2) The ASI may require the repair station to submit a CAP, depending on the nature of the deficiencies. If the plan is satisfactory, the ASI will submit the CAP along with the

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completed EASA Form 9 recommending the repair station for EASA approval. If the repair station fails to correct the deficiencies or to provide a CAP prior to the expiration of its EASA approval, the ASI will end the repair station renewal approval process and submit EASA Form 9 to EASA with a nonrecommendation for renewal approval.

3) In the event of unusual circumstances (e.g., a short period of time between the inspection and the expiration date), the ASI should contact the regional EASA coordinator if an extension of approval is necessary. The regional EASA coordinator will advise the EASA of the circumstances and obtain EASA concurrence with the FAA recommendation to extend the renewal date. The EASA may extend the duration of the repair station EASA approval for a reasonable period of time.

NOTE: ASIs should coordinate all nonrecommendations for EASA approval (initial/renewal/amendment) with the FAA regional EASA coordinator, who should act as the POC between the FAA and EASA.

2-1357 RENEWAL APPROVAL—EASA APPROVAL.

A. Prepare EASA Form 9. To recommend EASA Part-145 renewal approval, the ASI, by completing EASA Form 9, verifies that the repair station complies with the appropriate sections of the MAG, section B.

1) For a repair station seeking EASA Part-145 renewal approval, the ASI must ensure that the repair station underwent two complete inspections during the preceding 2-year period to determine compliance with part 145 and EASA special conditions. The ASI should identify the dates of the previous year's surveillance on EASA Form 9 (part 1) and the date of the current year's surveillance in the recommendation or nonrecommendation block.

NOTE: If any repair station elects not to pursue an EASA renewal approval, the ASI will complete the nonrecommendation block by writing "Nonrenewal" and will forward EASA Forms 3 and 9 to EASA.

2) EASA Form 9 must have the applicable blocks marked "Yes," "No," or "N/A." If the ASI has marked a block "No," he or she must identify the finding and/or corrective action in the findings/discrepancies block. If the ASI checks "Yes" in part 2, this indicates the FAA has accepted the EASA supplement.

3) If the repair station has a noncompliance concerning parts 43 and 145, the ASI will advise the EASA of the compliance and/or enforcement action using EASA Form 9. The ASI cannot withhold a positive recommendation. The final decision for EASA approval lies with the EASA.

B. Follow EASA Policy for EASA Form 9 Reporting Requirements.

1) The ASI will report on EASA Form 9 any change to the status of the repair station part 145 certificate, such as surrender, suspension, revocation, any change in ratings, change of address, etc. For findings that the repair station has not corrected, the ASI will leave the "date corrected" column blank and attach to EASA Form 9 any plans for corrective action.

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2) If the EASA does not issue a renewal approval for any reason other than an enforcement action, such as non-payment of fees, the EASA will inform the repair station and the ASI if the approval will remain valid until the EASA determines the validity of the issue.

C. Recommendation Package. The recommendation package will consist of the following:

- EASA Form 9. (For initial certification, complete Form 9 for the main facility, and for each additional fixed location, and line station under this approval. For renewal and amendment, complete only one Form 9 that includes line items 1 and 2 as seen in the MAG, section B, appendix 3.);
- EASA Form 16;
- A copy of the repair station profile from SPAS (attached to EASA Form 9);
- A copy of the repair station's FAA certificate and OpSpecs; and
- Any line station appendix from the EASA supplement, if appropriate.

D. Process the Recommendation for EASA Part-145 Approval. The ASI will submit the recommendation package to the EASA at least 30 days before the renewal due date. The ASI will submit the package using one of the methods below:

- Mail: European Aviation Safety Agency (EASA), Programmes Department, Applications and Certifications Manager, Postfach 10 12 53, D-50452 Köln, Germany;
- Fax: 011 49 221 89990 9505; or
- Email: foreign145@easa.europa.eu.

E. Receive a Copy of EASA Part-145 Renewal Approval. The EASA will process the renewal package in accordance with the MAG, section B, part II, paragraph 4. The FAA regional EASA coordinator will forward a copy of the EASA paperwork to the appropriate ASI. The EASA will include the repair station in the list of approved EASA Part-145 organizations, which is available on its Web site at http://easa.europa.eu/easa-and-you/aircraft-products/continuing-airworthiness-organisations/foreign-part-145-organisations-in-us.

F. Appeal of Revocation of EASA Part-145 Approval. Any repair station contesting the revocation of its EASA Part-145 approval may appeal to the EASA within 21 days subject to evidence being submitted at the time of the appeal. The repair station cannot appeal to the FAA when the EASA revokes or limits a repair station's EASA Part-145 approval. Repair stations should address any appeal to the EASA to the attention of the Executive Director of the EASA to initiate a conflict resolution process. The repair station's EASA approval will remain in temporary suspension awaiting the outcome of any appeal. Should a special audit be necessary, the repair station will incur a separate fee for the cost of this audit.

2-1358 RENEWAL APPROVAL—TASK OUTCOMES.

A. Complete the PTRS Record. The ASI will complete the PTRS record as needed.

B. Complete the Task. Completion of the task will result in the following:

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1) For a successful application, the ASI will:

a) File EASA Form 3, issued by the EASA, in the appropriate repair station file.

b) Update all relevant data fields of the eVID to indicate that the repair station is EASA-approved.

NOTE: When updating the eVID Block 2, the ASI will calculate the next renewal approval due date using 2-year intervals from the initial approval date. This date should coincide with the EASA approval date.

c) File a copy of EASA Forms 9 and 16, a copy of the evidence of need, and supporting information in the repair station's file.

2) For an unsuccessful renewal, the ASI will:

a) Notify the FAA regional EASA coordinator if there is a situation that caused the nonrecommendation for renewal approval.

b) Retain a copy of EASA Forms 9 and 16, a copy of the evidence of need, and supporting information in the repair station's file.

2-1359 RENEWAL APPROVAL—FUTURE ACTIVITIES. In regards to EASA Sampling Inspection System (SIS) team visits, the ASI will follow the MAG, section A, part II and Volume 12, Chapter 6, Section 1.

RESERVED. Paragraphs 2-1360 through 2-1380.

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VOLUME 2 AIR OPERATOR AND AIR AGENCY CERTIFICATION AND APPLICATION PROCESS

CHAPTER 12 CERTIFICATION OF A PART 147 AVIATION MAINTENANCE TECHNICIAN SCHOOL

Section 2 Evaluate Part 147 Aviation Maintenance Technician School's Curriculum/Revision and Instructor Qualifications

2-1446 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.

A. Maintenance: 3384 (initial)/3385 (revision).

B. Avionics: 5384 (initial)/5385 (revision).

2-1447 OBJECTIVE. This section provides guidance for evaluating the curriculum or curriculum revision of an Aviation Maintenance Technician School (AMTS) certificated under Title 14 of the Code of Federal Regulations (14 CFR) part 147.

2-1448 GENERAL.

A. Definitions.

1) Accreditation. Accreditation is the process used in U.S. education to ensure that schools, postsecondary institutions, and other education providers meet, and maintain, minimum standards of quality and integrity regarding academics, administration, and related services. This term refers exclusively to schools accredited within the United States.

2) Approved Noncertificated Instructors (Specialized Instructors). Individuals who are not certificated but who have been found qualified by the AMTS to teach mathematics, physics, basic electricity, basic hydraulics, drawing, and similar subjects. The applicant is required to maintain a list of the names and qualifications of specialized instructors, and upon request, provide a copy of the list to the Federal Aviation Administration (FAA).

3) Asynchronous Learning. The method of teaching that takes place utilizing prerecorded developed training preserved for the learner to participate in whenever the time is most convenient. Technology such as email, e-courses, online forums, and audio and video recordings make this possible. Asynchronous learning is considered more flexible than synchronous learning.

4) Aviation Technician Education Council (ATEC). An AMTS industry association.

5) Certificated Instructors. Those instructors who hold FAA mechanic certificates and the ratings appropriate for the AMTS subjects to be taught.

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6) Certification. This term refers to AMTS certificated as an air agency by the FAA.

7) Certification Project Manager (CPM). The person assigned as a team lead during an air carrier or Air Agency initial certification who provides guidance and written notification to the applicant during each phase of the certification project.

8) Common Hand Tools. Small, ordinary tools such as ratchets, sockets, and screwdrivers. This should not be considered an all-inclusive list, but simply an example for the ASI to consider.

9) Distance Learning. A method of delivering education and instruction, often on an individual basis, to students who are not physically present with an instructor in a traditional setting such as a classroom. Distance learning enables participation access to learning when the source of information and the learners are separated physically by time, or distance, or both.

10) Distance Education. Distance education courses that require physical on-site participation for any reason (i.e., taking examinations) can be referred to blended or hybrid courses of study. Distance learning is known by other terms such as e-learning, home study, self-guided training, virtual classroom, distributed training, computer-based training (CBT), web-based training (WBT), and others.

11) Flight Standards District Office (FSDO). The FAA certificate-holding district office (CHDO) with geographic oversight of a particular AMTS.

12) Focused Curriculum. Curriculum directed toward a particular area of the aviation industry. Examples include: Rotorcraft, Transport Category, Agricultural Aircraft.

13) Instructional Aids. Equipment used to provide instruction. Examples include diagrams, visual aids, computers, interactive software, aircraft, and mock-ups of aircraft, engines, and components, as well as actual components, such as magnetos and fuel controls. An instructional aid is not required to meet return to service standards.

14) Instruction Hour. The educational unit hour, as used by an AMTS, that consists of a time period of 50 to 60 minutes. This instructional time period conforms to the existing practices at many education institutions.

15) Laboratory. Facilities for providing instruction in general principles that may require student demonstrations or participation. Determination of what laboratory equipment is required depends on the subject taught and the teaching level at which it is taught.

16) Letter of Compliance or Statement of Compliance. A compliance statement listing each applicable part 147 section and providing either a brief narrative or a specific reference within the document(s) describing the manner of compliance with the regulation.

17) Maintenance Training Review Board (MTRB). The MTRB is an advisory board to plan, coordinate, and advise the FAA regarding the certificated AMTS required curriculum specific to part 147 appendices A, B, C, and D.

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18) Operation Specifications (OpSpecs). OpSpecs are approved documents identified by OpSpec paragraphs containing the authorizations, limitations, and certain procedures under which each kind of operation is to be conducted. Operational variables such as multiple ratings, management and designated personnel, affiliated Designated Mechanic Examiners (DME), exemptions, authorization/limitations, and approved manual systems are identified in applicable OpSpec paragraphs and approved through the issuance of those OpSpec paragraphs. OpSpecs are maintained in an internet accessible program known as Web-based Operations Safety System (WebOPSS).

19) Practical Project. A hands-on assignment that requires the use of manipulative skills taught at a teaching Level of 2 or 3. A practical project generally does not include nonmanipulative activities such as book reports. However, for certain required subjects such as maintenance publications, the use of FAA directives or manufacturers' data constitutes a practical project.

20) Principal Maintenance Inspector (PMI). The maintenance representative of the FSDO with principal responsibility for the certification and surveillance of a part 147 AMTS.

21) Principal Avionics Inspector (PAI). The avionics representative of the FSDO with principal responsibility for the certification and surveillance of a part 147 AMTS.

22) Practical Test Standards (PTS). PTS are a guide for students, instructors, the FAA, and Examiners to know what is expected on a test.

23) Ratings. An AMTS may be certificated for the following ratings: airframe, powerplant, or combined Airframe and Powerplant (A&P). The general portion of the required curriculum is not a rating, but it is a required part of all the ratings.

24) Rote Knowledge. A memorizing process using routine or repetition, often without full attention or comprehension. This may include facts such as an air agency's history, organization, and general policies and procedures. Committing an airplane's maintenance manual limitation section to memory, or getting a basic understanding of an airplane's systems by memory could also be rote knowledge.

25) Shop. Facilities for providing instruction on projects taught at teaching Level 2 or 3. The shop environment should resemble a typical aviation repair facility.

26) Shop Equipment. Machinery and supportive equipment, such as air compressors, work stands, racks, benches, fabricating devices, sheet metal equipment, and battery chargers.

27) Simulated Approval For Return to Service. A measured standard of instructing students' academic and manipulative skills in which to prepare them with the needed skills to maintain and properly return aircraft, parts, or components to service.

28) Special Tools. Highly specialized tools, such as tension meters, micrometers, and torque wrenches.

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29) Synchronous Learning. Learning that takes place when two or more people are communicating in real time, "live." Sitting in a classroom, talking on the telephone, and chatting via instant messaging are examples of synchronous communication.

30) Teaching Levels. Three levels of instruction with varying degrees of difficulty.

a) Level 1 requires:

1. Knowledge of general principles, but no practical application.

2. No development of manipulative skill.

3. Instruction by lecture, demonstration, and discussion.

b) Level 2 requires:

1. Knowledge of general principles, and limited practical application.

2. Development of sufficient manipulative skill to perform basic operations.

3. Instruction by lecture, demonstration, discussion, and limited practical application.

c) Level 3 requires:

1. Knowledge of general principles, and performance of a high degree of practical application.

2. Development of sufficient manipulative skills to simulate return to service.

3. Instruction by lecture, demonstration, discussion, and a high degree of practical application.

31) Troubleshoot. To systematically analyze and identify malfunctions, and to identify the source of trouble in an airframe, powerplant, or aircraft component. For the purposes of AMTS, the item of equipment or simulator training aids must be in operating condition. For example, a turbine powerplant must be operational for the student to troubleshoot.

B. Curriculum Background. Part 147, § 147.21 sets forth the minimum curriculum requirements. Maintenance of curriculum requirements is set forth in part 147, § 147.38.

1) Practical projects referred to in § 147.21(d) include all functions specified in the curriculum that involve hands-on tasks. Therefore, practical projects should include any task taught to Level 2 or 3, as specified in part 147 appendices, since all of these require some practical application.

2) Section 147.38 addresses the maintenance of curriculum requirements. Generally, part 147 prescribes minimum standards for certification and operation. These standards may be exceeded, but only when they are part of an approved curriculum.

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3) An AMTS must adhere to its approved curriculum. Any new course material the school wishes to add must be incorporated into the approved curriculum and approved by the FAA before it may be used. This does not prohibit a school from teaching other non-FAA-approved courses, such as refresher courses or academic courses required to complete a degree program. However, those courses must be clearly distinguishable and separate from approved AMTS courses. In addition, other courses offered must not detract from the quality of instruction or any portion of the FAA-approved part 147 curriculum.

4) An AMTS should strive to keep its approved curriculum current to meet industry needs or standards by revising courses as appropriate. It must be made clear, however, that these revisions require FAA approval before they can be implemented.

C. Curriculum Components. The FAA must approve the curriculum or revision. The part 147 approved curriculum will consist of the following for each subject:

- Subjects taught (part 147 appendices B, C, and D);
- Course descriptions/content (theory and lab proportions);
- Teaching level requirements (part 147 appendix A);
- A list of minimum required school tests to be given;
- The total number of hours required for successful completion;
- Required practical projects with corresponding lab hours;
- A schedule of required tests or quizzes for each subject area;
- Order of instruction or prerequisites for each subject area;
- Interruptions in the order of instruction;
- Courses (as approved by OpSpec A026) to be delivered using distance learning technology;
- Portions of part 147 required hours to be delivered via distance learning; and
- Method of delivery for curriculum components taught through distance learning.

NOTE: Each certificated AMTS must include an explanation of the procedures it will utilize to comply with part 147 subpart C, Operating Rules, in its curriculum procedures document/manual. The AMTS may have a separate section capturing those operating rules as specified in part 147 subpart C addressed in a compliance statement covering each part 147 section. See Volume 2, Chapter 12, Section 1 for further information regarding curriculum approval.

D. Textbooks. It is not a requirement of part 147 to have textbooks approved as a part of this process; however, if specific textbooks are approved as part of the curriculum, any change to a different text will require FAA approval as a revision. FAA-H-8083 series are automatically approved, and supplemental texts do not require approval.

2-1449 CURRICULUM REQUIREMENTS.

A. Hours of Instruction.

1) Minimum Hours Specified by § 147.21. The number of hours of instruction offered by a curriculum must be at least the minimum specified by § 147.21. The school may

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offer more hours of instruction; however, regardless of the number of hours offered, the FAA must approve the entire AMTS curriculum at the time of initial certification or any subsequent revisions to the curriculum as requested by the AMTS.

2) Deviations to the Curriculum. The following blocks of time are not to be included in calculating the minimum number of instructional hours specified in § 147.21:

- Time used to take the FAA oral and practical test,
- Time spent in taking the FAA knowledge test, and
- Specific FAA test-prep courses.

B. Order of Instruction. The curriculum must describe the order of course progression for each rating offered. For example, basic electricity would be a prerequisite for Aircraft Electrical Systems. The Order of Instruction or prerequisites must be identified and evaluated by the FAA during the curriculum approval process during initial certification and during review of subsequent curriculum revisions.

1) Interruption in the Order of Instruction (Curriculum). Interruptions causing deviations from the approved course curriculum (however frequent) must be reported by the AMTS to the principal inspector (PI). Reporting of an interruption in the Order of Instruction allows for discretionary surveillance by the PI. Allowances to deviate from the approved curriculum Order of Instruction may be permitted on a case-by-case basis (inoperative mock-ups, hospitalized instructor, etc.) in accordance with procedures described in the curriculum and/or the school's operating procedures.

2) Revisions to the Curriculum. Deviations that are deemed to be continuous, on-going will necessitate a revision to the curriculum and subsequent FAA approval. The assigned PI will monitor all interruptions in the Order of Instruction to ensure that these interruptions do not detract from the quality of instruction. Prolonged or extended continuous interruptions in the Order of Instruction may require FAA approval by the appropriate FSDO.

NOTE: The FAA does not consider student-induced interruptions in training due to absence (illness, financial problems, vacation, etc.) as a change in the Order of Instruction. These types of interruptions may require makeup provisions covering the missed subject matter.

C. Subjects Prescribed by Part 147. The curriculum must cover the subjects and items prescribed in part 147 appendix B, and in appendices C or D, as applicable.

1) Subjects that are submitted for approval as part of the curriculum will not be made part of the curriculum until approved by the FAA.

2) Each subject item must be taught at the minimum level of proficiency as defined in part 147 appendix A. When the school wishes to teach a subject item to a level beyond the requirements, the teaching level must be made part of the approved curriculum. Subject items must not be taught to a level less than that shown in the approved curriculum.

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3) Additional subjects/courses that are required by the school for their purposes (i.e., degree programs) must not be submitted as part of the FAA-approved curriculum.

4) A distinction must be made between additional courses/subjects that are part of the approved curriculum under part 147, and those that are not.

5) The teaching of additional subject material beyond the requirements of part 147 appendices B, C, and D items will require additional instruction hours beyond those required by § 147.21.

6) The teaching of subject items beyond the requirements of part 147 appendices B, C, and D will not require additional instructional hours beyond those required by § 147.21.

D. Practical Application Projects.

1) The curriculum must list the practical projects that must be completed for each subject item. There must be sufficient practical projects to address the requirements of part 147 appendices B, C, and D, as applicable. The curriculum must include enough detail to evaluate the practical projects for correct teaching level, for equipment and tools needed, and for performance standards and objective grading criteria.

2) The teaching level must be specified for each project under each subject item. The minimum teaching level is specified in the part 147 appendices. As in the case of theoretical courses, if the teaching level is to exceed the 14 CFR requirements, it must be specified as such in the curriculum.

3) The curriculum must show an appropriate amount of time for each subject area, consistent with the levels and definitions as specified in part 147 appendix A. ASIs who approve, or have oversight for the operation of, an AMTS will review and monitor curriculums to ensure they do not provide insufficient or excessive time allotments based on criteria associated with the rule.

4) The curriculum must provide that each task in each subject item is accomplished. For example, if a project requires that the student inspect and repair to accomplish a practical project, a requirement for both inspection and repair must be included in the project plan.

5) The ASI should ensure that instructional hours for each subject are distributed in a manner which allows both adequate theory instruction (Levels 1, 2, and 3) and sufficient lab/shop instruction (Levels 2 and 3) to obtain the required practical application (teaching level) for the item being taught.

E. Scheduling of Tests. Upon completion of each curriculum subject, a test shall be scheduled. Additional tests and quizzes may be administered during the subject being taught.

F. Grading Criteria. A generally accepted academic standard for passing (including the FAA written exams) is a minimum of 70 percent. However, the school may require a higher minimum passing grade. All theoretical and practical portions of each subject listed in the

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curriculum must be passed to the approved grading standard. Each practical project must be passed to the approved standard.

G. Makeup Provisions. Section 147.21 specifies the minimum hours required for Airframe, Powerplant, or a combined A&P curriculum, and the curriculum must be approved by its FAA CHDO. The FAA has always required that attendance and hours missed be controlled to establish that a graduate has indeed completed those minimum hourly requirements either through in-school attendance or the approved makeup system. Section 147.31 requires an approved system for determining final course grades and for recording student absence. The system must show hours of absence allowed and show how the missed material will be made available to the student for makeup. This system for recording absence will clearly show if the student has completed those minimum hourly requirements, either through in-school attendance or through use of the approved makeup system.

1) All missed time, projects, and assignments in a subject must be made-up in order for the student to take the final exam and receive credit for the subject.

2) All makeup work will be supervised or verified by an instructor qualified in that subject.

3) Makeup assignments must be the material missed.

4) Student makeup for missed lecture(s) may consist of at least one, or a combination, of the following:

a) Instructor presents the missed subject material to the student.

b) The student sits in another section of the same course and receives the missed lecture subject material.

c) The student completes a written essay of 300 to 500 words, or an equivalent project, on the material missed during a lecture hour.

d) The student completes a minimum of 10 written answers to questions, providing references if applicable, on the material missed during a lecture hour.

e) The student writes an outline of a minimum of 150 words and makes an oral presentation to the instructor on the material missed during a lecture hour.

f) The student receives an oral exam from the instructor on material that is missed during a lecture hour.

g) Should the student miss a quiz or exam that was given during the lecture period, a makeup quiz, or exam, is completed as applicable.

h) Any other method acceptable to the Administrator.

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5) Failure to complete all makeup assignments within the allotted time period may result in the student being required to repeat that subject.

6) Makeup assignments, class assignments, and exams missed in a module must be completed by the last day of that module.

2-1450 CURRICULUM DELIVERED USING DISTANCE LEARNING TECHNOLOGY.

A. Background. Various new information-sharing systems continue to be developed as learning management systems. Many of these systems consist of modern training products, several of which are being used efficiently and effectively today in the delivery of aviation courses conducted by accredited universities and air carrier training programs approved by the FAA. This type of training delivery method is known as "distance learning." In addition to proven effectiveness of modern training products, distance learning affords a low-cost alternative to classroom training. Distance learning is an alternative method of learning that is timely and appropriate in today's challenging economic environment.

B. AMTS Approval and Implementation of Distance Learning Programs.

1) A certificated AMTS proposing the implementation of distance learning should submit a request to the local FSDO requesting information and/or approval for authorization to conduct distance learning.

2) The responsible PI should provide source references of distance learning program guidance to the AMTS as requested. If the AMTS has submitted a proposed distance learning program, the PI must review the entire program for written policies, procedures, and equipment sufficient to conduct distance learning prior to any authorization and approval of the program.

NOTE: Approval for the AMTS to utilize distance learning as a teaching delivery method does not alleviate the AMTS from meeting all part 147 requirements. If the AMTS does not meet the minimum requirements to support implementation of distance learning, the PI must not approve distance learning for the AMTS by issuance of OpSpec A026 until minimum requirements have been satisfied.

C. Distance Learning Program Surveillance. As an alternative to classroom training, the distance learning instruction delivery method continues to develop utilizing distance learning technology. The initial implementation and subsequent surveillance of a distance learning program requires written policy and procedures and, at a minimum, the following:

1) An Electronic Learning Management System (eLMS) of sufficient hardware and software technology to accomplish comprehensive storage, handling, and tracking of all aspects of the distance learning program, including:

a) Student online distance learning attendance tracking/recording.

b) Student online distance learning participation tracking/recording.

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c) Student online distance learning performance measurement tracking/recording.

2) AMTS to have issuance of OpSpec A026 prior to conducting distance learning.

3) Distance learning course list availability.

4) FAA "read-only" access to the eLMS (to facilitate surveillance).

5) Report availability for analysis of distance learning test scores in comparison to traditional classroom test scores.

6) Report availability for analysis of distance learning course completion times in comparison to traditional classroom completion times.

7) Verification by the AMTS to ensure distance learning courses combined with traditional classroom AMTS courses meet minimum curriculum requirements defined by part 147.

8) Identification of students who are not certification-seeking but are enrolled in AMTS distance learning courses. Regulatory requirements would not apply to these students.

NOTE: Deficiencies found within the distance learning program during surveillance must be identified and brought to the attention of the AMTS for necessary correction. An AMTS with approval to conduct distance learning must continually operate to meet the requirements of the approved distance learning program to enable continued approval authorization to conduct distance learning.

D. Advantage of Distance Learning. An advantage of distance learning is the versatility and flexibility of time management for today's student. The flexibility provided through distance learning promotes a learning environment conducive to efficient and thorough training made available often on a schedule and at a location of the student's choosing apart from a traditional classroom.

1) Curriculum subjects delivered through the distance learning delivery method adopted from part 147 appendices B, C, and D must be FAA-approved. The teaching materials and equipment utilized to support distance learning may be accepted by the FAA. The quality of instruction must continue to meet or exceed the established baseline standards of the instructor-led traditional classroom training it is intended to replace.

NOTE: Initial implementation of distance learning by an AMTS should be approved cautiously. The implementation of distance learning as an alternative to the classroom environment by the AMTS for teaching required subject areas or items should be integrated into the AMTS curriculum in structured steps based on the AMTS demonstrated ability to design and implement a distance learning system. A distance learning program should be implemented while maintaining the current traditional classroom environment. Distance learning, if implemented properly, can be an alternative delivery method designed to be delivered

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concurrently with traditional classroom courses. It is recommended that distance learning subjects be approved in phases or through an initial approval process followed by a trial period prior to issuing final approval. This structured incremental progression of distance learning implementation will allow for the identification and correction of problem areas as well as the overall feasibility for the AMTS to support distance learning.

2) All assigned FAA inspectors to an AMTS that conducts distance learning shall be given access to the distance learning eLMS as a read-only authorization to the instructional delivery, testing, and discussion methods utilized for distance learning by the part 147 AMTS.

3) Distance learning is primarily suited for delivering instruction by lecture, visual demonstration, discussion, and knowledge of general principals, but not practical application and no development of manipulative skill. Distance learning may not be suitable for teaching some subject matter in an approved AMTS curriculum.

4) However, curriculum subjects that have been typically taught encompassing paper laboratory assignments may be found to be suitable for distance learning. Distance learning is not suitable for teaching certain aspects of the subject matter listed in an AMTS curriculum. It is most suited for subjects that can be taught entirely by using distance learning methods. Examples would include, but may not be limited to: Basic Electricity, Aircraft Drawings, Federal Aviation Regulations, and Mathematics. Distance learning delivery is not restricted to just the general curriculum topics. It may be suited for delivering the theory portions of A&P subjects as well. Subjects that have typically been taught using only lecture (or lecture and paper) laboratory assignments may also be suitable for distance learning. In addition, an AMTS may design combination distance learning and onsite laboratory format that would combine lecture material presented utilizing distance learning with an on-campus session(s) to cover required laboratory material and testing.

5) Curriculum subjects taught utilizing distance learning may also remain available within the AMTS as a traditionally-offered classroom course for those students wishing to attend in this manner. Prior to accepting a student for enrollment into distance learning, the AMTS must determine if the student has personal access to required computer equipment as well as sufficient computer skills essential for the successful completion of a course delivered via distance learning.

6) Distance learning should be limited to instruction that can be easily delivered through computer-based use. The ASI should keep in mind that a student completing a course delivered by distance learning must successfully complete all specific course requirements as specified in the AMTS-approved program.

7) While it is expected that proposals to implement distance learning will vary in instructional methodology and content, approved course programs should address the following items:

- A description of the course content and a listing of specific student course requirements,

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- A breakdown of the number of distance learning course hours in the approved traditional 1,900-hour curriculum,
- Maximum student enrollment for classes that include Level 2 and/or Level 3 content, in accordance with § 147.23,
- A system and method to be used for timely and appropriate interaction between students and instructor(s),
- A description of how the distance learning class is administered, and
- A specification on the calendar time allowed for the completion of the course.

E. Evaluation, Testing and Assessment. This section includes a description of the examination and testing process, and also methods for ensuring the integrity of student work and compliance with part 147 appendices A, B, C, and D.

1) Testing and evaluation are intended to verify that learning occurred and the trainee attained the planned learning objectives. Testing may be the most important aspect of any training program and, as such, should produce valid and reliable results. Consequently, the design of tests and the procedures for conducting tests are critical.

2) Testing for students participating in distance learning activity can be a special challenge. Testing can be accomplished through a variety of methods, including: oral evaluation, practical exercises on desktop computers or specialized part-task training devices, paper-based, or computer-based exams proctored by an evaluator.

NOTE: Proctored exams (testing) at a remote location may only be accomplished within the facilities of another active AMTS or accredited educational institution, or through an approved remote proctoring system. The procedure must be documented in a written agreement between each participating AMTS while holding the originating part 147 AMTS responsible for all aspects of the test. The process and agreements will then be made a section within the AMTS procedures manual and accepted by each respective FAA office with geographic oversight of each AMTS location.

3) The testing method used and the types of questions employed should suit the objectives to be tested and the demographics of the target population. Keep in mind that knowledge objectives are typically assessed by written, electronic, or oral testing.

4) Skill objectives are typically assessed by a combination of written, electronic, oral testing, and thorough task performance demonstration. Skill items utilizing specialized tools and equipment or any form of measurement device, therefore, are not suitable for accomplishment within the distance learning approval process.

F. Recordkeeping.

1) Distance learning records must be retained by the AMTS in accordance with the § 147.33 recordkeeping requirements/timeframes.

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2) An instructor or designated AMTS representative must keep records of course activities to include: students enrolled, assignments completed, and grades assigned.

3) For distance learning classes, the record of the student's successful completion of all course requirements must be documented to meet the § 147.33(a)(1) attendance record requirement.

G. eLMS Description Requirements.

1) A description of the technology hardware and software to be utilized.

2) A listing of the reference material required for the successful completion of the distance learning and classroom course content.

H. Considerations for Distance Learning.

1) System Considerations and Performance. Distance learning computerized storage space should be sufficient to accommodate all current training materials and scalable enough to accommodate future materials.

2) Reliability and Availability. A distance learning system should have sufficient redundancy and fault tolerance to provide continuous availability to required training materials 24 hours per day, seven days per week (barring scheduled system maintenance downtime).

3) Security. Only authorized personnel may have access to the system. The AMTS may choose to allow various users to access the system via different methods, links, and times. Access rights should be controlled by a system administrator. The certificate holder's security plans must describe how the system will recognize and deal with attempted security breaches. The AMTS is responsible to ensure that system security for the distance learning eLMS is adequate to ensure proper protection of materials and users, but not so rigid that it impacts the ability for training management and training development personnel to efficiently accomplish their duties.

2-1451 REVISIONS TO THE CURRICULUM. Changes to the approved curriculum must be approved before implementation. Changes in the curriculum may include changes in any of the following:

- Teaching level;
- Hours of instruction;
- Testing;
- Makeup provisions;
- Course descriptions (theory and lab proportions);
- Equipment or facilities affecting instruction in theoretical subjects or the accomplishment of practical projects;
- Order of instruction such as changes in the logical sequence of instruction;
- Addition or deletion of a rating;

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- Interruptions in the Order of Instruction; and
- Distance learning program.

2-1452 CREDIT FOR PREVIOUS INSTRUCTION OR EXPERIENCE.

A. Crediting Previous Instruction at a Certificated AMTS. The AMTS must use either a reliable method of evaluating documentation or an entrance test to ensure that previous instruction is comparable to that offered by the crediting AMTS. When not using an entrance test, schools should be encouraged to use transcripts, course descriptions, and other documents to determine the credit to be granted.

1) AMTS students may take a course of study for one rating (either Airframe or Powerplant). The course of study will include the general curriculum subjects. A person returning to, or applying to, an AMTS to further study for a second rating after having graduated from an AMTS will not be required to retake the general curriculum subjects. This applies to individuals having acquired one rating through experience or as an AMTS graduate. The General Curriculum subjects must be separate and distinct from both the A&P curriculum subjects and must conform to the requirements of part 147 appendices A and B.

2) If a certificated AMTS is under suspension by the FAA, courses taught during the suspension period must not be credited retroactively, even if the school becomes re-certificated later.

3) An AMTS applicant must not teach students as an AMTS before school certification is granted, and then give credit for that training after the school becomes certificated.

4) A school may not credit a student with instruction that was completed satisfactorily at another AMTS before receiving its certification (§ 147.31(c)(1)(iv)).

B. Crediting Previous Instruction From Other Schools (Non-AMTS, Accredited and Non-Accredited). As a general practice, credit may be granted only for subjects that apply to the general portion of the curriculum, including (but not limited to) mathematics, basic physics, and similar subjects.

NOTE: Accreditation, as referenced in part 147 and the current edition of AC 147-3, Certification and Operation of Aviation Maintenance Technician Schools, refers to schools accredited within the United States. A certificated AMTS may not grant credit for maintenance instruction received outside the United States.

C. Crediting Previous Instruction from Military Technical Schools. When credit is granted, it may be granted only on the basis of an entrance test, as specified in § 147.31(c)(2)(iii).

D. Credit for Previous Experience. Previous mechanic experience must be aviation maintenance experience to be considered for credit. Credit for all previous experience must be

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documented and demonstrated by testing. The test must be equal to the test given to students who complete the comparable required curriculum subjects at the school.

2-1453 INSTRUCTOR QUALIFICATIONS AND FACULTY REQUIREMENTS.

A. Faculty Requirements.

1) An instructor must hold an FAA mechanic certificate with ratings appropriate to the subjects that the instructor teaches.

2) Individuals listed as instructors, lab assistants, or teaching assistants should also hold appropriate mechanic certificates and ratings. However, the AMTS may provide specialized instructors who are not certificated mechanics to teach mathematics, physics, basic electricity, basic hydraulics, drawing, and similar subjects.

B. Student/Teacher Ratios. Section 147.23 requires at least one certificated instructor for each 25 students in each shop or laboratory class.

NOTE: The ASI should monitor the student/teacher ratios and alert the school when the ratios have/will exceed the limitations set forth by § 147.23. The school has the option to add another instructor(s) on a temporary or permanent basis depending on the staffing needs at the time. This will assure the student/teacher ratio of no more than 25 will be maintained continuously. Under certain circumstances, the AMTS has the option to apply for an exemption to the rule by petitioning the office of rulemaking.

C. Performance. The ASI should encourage the school to provide for regular assessment of instructor performance.

2-1454 PREREQUISITES AND COORDINATION REQUIREMENTS.

A. Prerequisites. Knowledge of the regulatory requirements of 14 CFR parts 43, 65, and 147.

B. Coordination. This task may require coordination with certification team members, regional specialists, and other Maintenance or Avionics ASI.

2-1455 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions). FAA Order 8900.2, General Aviation Airman Designee Handbook.

B. Forms. FAA Form 8310-6, Aviation Maintenance Technician School Certificate and Ratings Application.

C. Job Aids. JTAs: M3.4.32, M2.4.14, 3.4.36.

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2-1456 PROCEDURES.

A. Review the Curriculum. For an initial certification, thoroughly analyze the curriculum before the date of the team inspection. Ensure the following:

- The number of hours meets the requirements of § 147.21;
- The curriculum fulfills the requirements of part 147 appendices A, B, C, and D;
- Instructor qualifications match the subjects being taught;
- All subjects taught to Level 2 or 3 involve some practical hands-on projects or skill demonstration;
- Instructional hours for each subject should be distributed in a manner which allows both adequate theory instruction (Levels 1, 2, and 3) and sufficient lab/shop instruction (Levels 2 and 3) to obtain the required practical application (teaching level) for the item being taught;
- The curriculum shows a list of minimum required school tests to be given. This could be a separate document, or be provided within the course outlines;
- The curriculum states the minimum standards for a student to successfully complete the requirements for FAA certification;
- Grading criteria for academic and practical subjects have been developed;
- Makeup provisions are included; and
- Procedures for crediting previous experience or instruction have been developed.

B. Review Operating Rules. Review the school's operating policies and procedures, in accordance with Operating Rules in part 147 subpart C. The school's operating policies and procedures should describe how the AMTS will comply with the regulations which are not addressed within the curriculum. The school's operating procedures may be included in a Letter of Compliance (i.e., statement of compliance (SOC)) or within a separate manual or document.

C. Review Instructor Qualifications. Review mechanic certificates of the instructors required to maintain mechanic certification for currency and pending certificate action.

D. Review OpSpecs. Determine that the following actions are complete:

- Mandatory OpSpec paragraphs have been issued;
- Optional applicable OpSpec paragraphs have been issued;
- AMTS maintains a current set of OpSpecs; and
- AMTS operating in accordance with the OpSpecs.

2-1457 TASK OUTCOMES.

A. Complete the PTRS Record.

B. Complete the Task. Completion of this task will result in the following:

1) If Curriculum/Revision/Instructor Qualifications are approved:

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a) For an initial certification, review and complete the FAA Form 8310-6. Attachments to FAA Form 8310-6 must include the following:

- The proposed curriculum;
- A list of required practical projects;
- A list of minimum required tests to be given;
- List of facilities and equipment to be used;
- Photographs or floor plans of facilities;
- A list of instructors' names, with certificate type, certificate numbers, ratings held, type, and subject(s) to be taught; and
- A template of a student record.

b) Approve the curriculum by signing and dating the List of Effective Pages (LEP) and revision pages.

c) Update OpSpecs as necessary, and verify that they are complete.

2) If Curriculum/revision/instructor qualifications are not approved:

a) For an initial certification, complete FAA Form 8310-6. Fill out FAA Form 8310-4, Aviation Maintenance Technician School Inspection Report, which is on the back of FAA Form 8310-6.

b) Send a letter to the school outlining the deficiencies and explaining why the curriculum is unacceptable and requires revision. In all cases, reference the applicable 14 CFR parts.

c) If an instructor is found to be unqualified or otherwise ineligible to teach the subjects as designated by the school curriculum, notify the school in writing, detailing the specific problem.

2-1458 FUTURE ACTIVITIES. Routine surveillance.

RESERVED. Paragraphs 2-1459 through 2-1475.

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VOLUME 2 AIR OPERATOR AND AIR AGENCY CERTIFICATION AND APPLICATION PROCESS

CHAPTER 12 CERTIFICATION OF A PART 147 AVIATION MAINTENANCE TECHNICIAN SCHOOL

Section 3 Evaluate Part 147 Aviation Maintenance Technician School Facilities, Equipment, Materials, Tools, and Records

2-1476 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.

A. Maintenance: 3230.

B. Avionics: 5230.

2-1477 OBJECTIVE. This section provides guidance for evaluating the facilities, equipment, materials, and tools for an Aviation Maintenance Technician School (AMTS). The evaluation occurs as part of an original certification, addition of a rating, curriculum change, or change of location.

NOTE: The criteria in this section is applicable for both initial certification and a currently certificated AMTS.

2-1478 GENERAL.

A. Definitions.

1) Common Hand Tools. Small, ordinary tools such as ratchets, sockets, etc.

2) Instructional Aids. Equipment used to instruct, such as mock-ups, diagrams, visual aids, aircraft, engines, components, etc.

3) Shop Equipment. Machinery, fabricating devices, spray paint equipment, battery chargers, etc.

4) Special Tools. Highly specialized tools such as tension meters, micrometers, torque wrenches, etc.

B. Appropriate Equipment and Facilities. An AMTS must have instructional equipment and suitable facilities appropriate to the ratings taught and approved by the Federal Aviation Administration (FAA). Materials and tools must be of a type, quantity, and quality appropriate to the needs of the curriculum and the number of students.

2-1479 PRE- AND POST-INSPECTION ACTIVITY.

A. Initial Certification. The certification team will approve the curriculum before formal inspection of the facility. During the preapplication meeting, the certification project manager (CPM) may request a briefing and an informal inspection of the facility. The applicant

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may request that an aviation safety inspector (ASI) informally evaluate the facility to see if it appears to be within the guidelines of Title 14 of the Code of Federal Regulations (14 CFR) part 147. This may be accomplished before completion of the facility, but only after the applicant submits FAA Form 8400-6, Preapplication Statement of Intent.

B. Added Rating/Curriculum/Location Change. The AMTS must request in advance any change to its rating or curriculum. When adding a rating or executing a change in curriculum or location that affects facilities, equipment, materials, or tools, etc., the office manager or airworthiness unit supervisor will determine whether one ASI or a team is necessary to accomplish the site inspection.

1) To add a rating, see the appropriate sections on changes to curriculum in Volume 2, Chapter 12, Section 2 and the appropriate 14 CFR sections on changes to equipment, materials, tools, and records found below.

2) For changes to curriculum, see curriculum requirements as found in Section 2.

3) For change in location within the district office geographic boundaries, the district office must make a detailed analysis of the change in plans and their effect on the following:

a) The students in training, whether or not in actual attendance during the time of the change.

b) Instructional hours as shown in the curriculum. There must not be a loss of instructional hours as a result of these changes.

c) The school's method of meeting the certification requirements, particularly space requirements and curriculum according to part 147, §§ 147.15 and 147.21.

4) The school must receive approval in writing.

5) Revise operations specifications (OpSpecs) as appropriate to reflect applicable changes.

6) If a change has been made without approval, the district office must begin an enforcement investigation procedure to ensure compliance.

7) For the addition of a Distance Learning (DL) program, see Volume 2, Chapter 12, Section 1, subparagraph 2-1417C.

C. Amendment to or Transfer of Certificate. The AMTS must apply for a change to its certificate if changing the location of the AMTS. The air agency must notify the FAA in writing at least 30 days before the date of the change. The FAA may prescribe conditions the air agency must follow while moving to the new address/location. If the AMTS accomplishes the change in location without approval, the Air Agency Certificate will be revoked. (Refer to § 147.41.)

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1) Change of FAA District. When the location is a change to another FAA district office or region, the application for approval must go to the district office and receive coordination through each respective region that has current and/or future certificate responsibility. The originating district office will contact and coordinate directly with the receiving district office while maintaining close coordination with the affected Regional Office(s) (RO). The school remains the responsibility of the originating district office until approval of the change or transfer. See Volume 2, Chapter 1, Section 2 for additional information.

2) Sale or Transfer of Assets. A new certificate number is not required when there is a change in ownership or operator name, but the privileges of an AMTS Air Agency Certificate are not transferable. If the holder of the Air Agency Certificate sells or transfers its assets, the new owner must apply for an amended certificate. The principal inspector (PI) must contact the Aviation Data Systems Branch (AFS-620) and give an explanation of the changes prior to any certificate changes. In rare cases where the certificate number does change, the designator element of the certificate number will remain the same. The type certificate (TC) code and the numeric or alpha suffix element should be appropriately changed to form the new certificate number (see Volume 2, Chapter 1, Section 3, and Volume 3, Chapter 34, Section 3).

3) Liability Issues. The ASI should recommend a new certificate number due to the Freedom of Information Act (FOIA) and liability issues. ASIs should inform prospective owners that they may be held liable for the work performed under previous management if they keep the same certificate number. New owners must stipulate in writing that they clearly understand the potential of release of information under the FOIA before receiving permission to retain the old certificate number.

4) Certificate Number. If the new owner elects to retain the original certificate number, the revised Air Agency Certificate (FAA Form 8310-6, Aviation Maintenance Technician School Certificate and Ratings Application) will show the original certification date in the “Date Issued” field. If issuing a new certificate number, prepare a new Air Agency Certificate using the effective date of the new certificate. The “Date Issued” should always reflect the original certification date for the certificate number identified on the Air Agency Certificate.

5) Change in Ownership. A change in ownership may or may not affect the status of an AMTS. If the operational relationship that established an AMTS continues unchanged, a change to the certificate number may not be required. If that relationship no longer exists, the certificate number identifying the AMTS cannot be retained by the new owner.

6) Role of Regional General Counsel Office. ASIs should contact their Regional General Counsel office when faced with questions concerning whether limited liability corporations or changes in stockholder ownership constitute a transfer of AMTS assets.

2-1480 DEMONSTRATION ACTIVITY. Ensure compliance with regulations as follows:

- That facilities meet the requirements of §§ 147.13 and 147.15;
- That instructional aids meet the requirements of § 147.17;

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- That materials, tools, and shop equipment meet the requirements of § 147.19; and
- That the DL electronic Learning Management System (eLMS) meets the program requirements of § 147.21.

2-1481 FACILITIES. The instructional equipment, shop equipment, hand tools, and physical layout of the building must meet the requirements outlined in §§ 147.15, 147.17, and 147.19. The ASI should keep in mind that the facility must constitute an environment suitable for learning. The AMTS should defer facility issues concerning safety suitability or industry standards to local, State, and/or Federal guidelines specific to Occupational Safety and Health Administration (OSHA) requirements and regulations.

A. Classroom Areas. An area suitable for classroom instruction may not be suitable for lab and/or shop. With appropriate scheduling and consideration of factors such as ventilation, lighting, noise, and temperature control, an area appropriate for lab and/or shop may be acceptable for classroom instruction.

B. Shop Environment. Ventilation must be such that it properly removes fumes from painting, fueling, degreasing, composite areas, etc., from the immediate work area and does not allow them to pass into other instructional areas.

C. Facility Size and Location.

1) Facilities must be adequate to hold the number of authorized students participating in any of the shop/lab projects designated for that area.

2) Facility locations and class schedules must be so that students can travel between classes without cutting into instructional time. ASIs should pay special attention to situations in which the students cannot go easily and quickly from one class to another.

2-1482 EQUIPMENT.

A. Instructional Equipment.

1) The instructional aids required in § 147.17 must be appropriate to the scope and depth of the curriculum of the school. The ASI must determine whether the complexity of instructional aids is appropriate to the specific teaching level of the subject item.

2) In some situations, the school may choose to use active aircraft for instructional purposes in the shop. This is permissible as long as the aircraft is on the premises at the time of instruction. The ASI must remind the school that active aircraft used to comply with §§ 147.17(a)(2) and 147.17(d) must become part of the approved instructional equipment and must be available as specified in § 147.37.

3) The ASI must ensure compliance with requirements for the ratio of instructional equipment to students in each shop course. Section 147.17(c) requires that a maximum of eight students may work at any one unit of equipment at a time. However, the ASI may determine whether or not eight students are too many to complete a certain project safely and competently, such as when using live aircraft for the demonstration of gear retraction systems.

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B. Shop Equipment.

1) The ASI must determine if enough equipment is in place and in satisfactory operating condition to serve the student enrollment adequately and meet shop project requirements.

2) The location of equipment must be so that its operation can be in a safe and efficient manner. The installation of large standing equipment must be secure. The placement of large pieces of equipment should provide sufficient aisle space so that the students can move about freely. The ASI must determine if the floor is free from clutter and items such as extension cords.

2-1483 MATERIALS. The school must have sufficient materials in stock and properly stored to provide for the approved student enrollment. To ensure adequate instruction, the amount and variety of stock should directly reflect the requirements of the curriculum.

2-1484 TOOLS.

A. Tool Standards. For subjects taught at Level 3, all tools must be in satisfactory working condition and of the proper kind for their intended purpose. Section 147.19 requires the school to have an adequate supply of materials and tools appropriate to the curriculum of the school.

B. Student Hand Tool Policy. The school may either provide common hand tools or require students to furnish their own. In either case, the school must establish a policy on provision of common hand tools. The school must list any tools that it requires the student to furnish. The school will furnish special tools, such as cylinder hold-down wrenches, micrometers, etc.

2-1485 PREREQUISITES AND COORDINATION REQUIREMENTS.

A. Prerequisites. Previous experience with certification or surveillance of part 147 schools is desirable.

B. Coordination. This task requires coordination with Avionics ASIs and certification team members, as appropriate.

2-1486 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- FAA Order 8900.2, General Aviation Airman Designee Handbook, and
- Advisory Circular (AC) 147-3, Certification and Operation of Aviation Maintenance Technician Schools.

B. Forms:

- FAA Form 8000-4, Air Agency Certificate (for initial certification), and

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- FAA Form 8310-6, Aviation Maintenance Technician School Certificate and Ratings Application.

C. Job Aids:

- Job Task Analysis (JTA) 3.4.32,
- JTA 3.4.34, and
- JTA 3.4.36.

2-1487 PROCEDURES.

A. Review the Applicant's File. Before inspecting the facility, review the applicant's application and Flight Standards District Office (FSDO) file. Check history for previous non-compliant trends. Check the curriculum or proposed curriculum for currency. Take a copy of the curriculum and OpSpecs. Prior to visiting the facility, make sure you have a copy of the facility diagram to confirm the facility layout mirrors the diagram. Review OpSpecs to ensure that all mandatory paragraphs are current. Additionally, determine if any applicable, optional OpSpec paragraphs are required and issued.

B. Inspect the Facility. Compare the curriculum against the instructional aids, shop equipment, and hand tools at the site. Compare the physical layout with the facility layout plan.

1) Check the instructional aids for agreement with the curriculum. Determine if the items required for each course are actually at the site as required by the approved student enrollment level.

2) Determine whether all instructional aids are actually operable and safe to use. For example, a retractable landing gear instruction device should operate properly.

3) Ensure that adequate stocks of operational/maintenance instructions, parts manuals, and technical data are at the site, according to the requirements of the curriculum.

4) Determine if the number and size of classrooms and shop areas are consistent with the facility layout submitted with the curriculum. Ensure that the lighting and ventilation are adequate.

5) Verify that the tools, materials, and shop equipment match the inventories required by the curriculum. Ensure the proper storage of these items.

6) Verify that a recordkeeping system is in place for tool inventory and updating of technical instructional materials.

7) Inform the applicant by letter of any discrepancies noted. Make a record of such deficiencies in the remarks section of FAA Form 8310-6, as appropriate.

8) Determine that AMTS maintains a current set of OpSpecs.

9) Determine that AMTS is operating in accordance with the OpSpecs.

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C. AMTS Approval and Implementation of DL Program.

1) A certificated AMTS proposing the implementation of DL should submit a request to the local FSDO requesting information and/or approval for authorization to conduct DL.

2) The responsible PI should provide source references of DL program guidance to the AMTS as requested. If the AMTS has submitted a proposed DL program, the PI must review the entire program for written policies, procedures, and equipment sufficient to conduct DL prior to approval authorization of the program.

NOTE: Approval for the AMTS to utilize DL as a teaching delivery method does not alleviate the AMTS from meeting all requirements of part 147. If the AMTS does not meet the minimum requirements to support implementation of DL, the PI must not approve the DL for the AMTS, nor issue OpSpec A026 until such time that the program and its requirements are found satisfactory to the FAA.

D. DL Program Surveillance. As an alternative to classroom training, the DL instruction delivery method continues to develop utilizing DL technology. The initial implementation and subsequent surveillance of a DL program requires written policy and procedures and, at a minimum, the following:

1) An electronic Learning Management System (eLMS) of sufficient hardware and software technology to accomplish comprehensive storage, handling, and tracking of all aspects of the DL program, including:

a) Student online DL attendance tracking/recording.

b) Student online DL participation tracking/recording.

c) Student online DL performance measurement tracking/recording.

2) AMTS to have issuance of OpSpec A026 prior to conducting DL.

3) DL course list availability.

4) FAA “read-only” access to the eLMS (to facilitate surveillance).

5) Report availability for analysis of DL test scores in comparison to traditional classroom test scores.

6) Report availability for analysis of DL course completion times in comparison to traditional course completion times.

7) Verification by AMTS: DL courses combined with traditional classroom AMTS courses meet, at a minimum, curriculum requirements defined by part 147.

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8) Identification of students that are not seeking certification but are enrolled in AMTS DL courses. Regulatory requirements would not apply to these students.

NOTE: Deficiencies found within the DL program during surveillance must be identified and brought to the attention of the AMTS for necessary correction. An AMTS with approval to conduct DL must continually operate to meet the requirements of the approved DL program to enable continued approval authorization to conduct DL.

2-1488 TASK OUTCOMES.

A. Complete the PTRS Record.

B. Complete the Task. Completion of the task will result in approval or disapproval of a facility.

C. Document the Task.

1) If Facility is Approved.

a) For an initial certification or added rating, complete FAA Form 8310-6, as applicable. Attach the appropriate documents, as required. Make a copy of the form and all pertinent documents and retain a copy for the district office file.

b) For a curriculum or location change that affects facilities, equipment, or tools, complete FAA Form 8310-6, as applicable. Retain a copy of the form for the district office file.

c) Update OpSpecs as necessary and verify that they are complete.

2) If Facility is Disapproved.

a) Mark FAA Form 8310-6 “Disapproved” and return to the applicant with attachments. Retain a copy for the office file.

b) Write a letter to the applicant stating the reasons for disapproval. Advise the applicant to resubmit a new application when the discrepancies are corrected. Upon receipt of a new application, reschedule the facility inspection.

2-1489 FUTURE ACTIVITIES. Routine surveillance.

RESERVED. Paragraphs 2-1490 through 2-1505.

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VOLUME 3 GENERAL TECHNICAL ADMINISTRATION

CHAPTER 13 LEASE AND INTERCHANGE AGREEMENTS

Section 6 Process an Aircraft Lease Agreement for Regulatory Compliance Under § 91.23

3-496 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODE. 1440.

3-497 OBJECTIVE. The objective of this task is to determine if an aircraft lease complies with Title 14 of the Code of Federal Regulations (14 CFR) part 91, § 91.23. Successful completion of this task results in a determination of whether the lease is in compliance or not with § 91.23.

3-498 GENERAL.

A. Definitions.

1) The lessor is the person furnishing the aircraft.

2) The lessee is the person to whom the aircraft is furnished.

3) For the purpose of § 91.23, a lease means any agreement by a person to furnish an aircraft to another person for compensation or hire, whether with or without crewmembers, which is not a contract of conditional sale under section 101 of the Federal Aviation Act of 1958 (FA Act).

4) Conditional sale is defined in the FA Act as:

a) "[A]ny contract for the sale of an aircraft … under which possession is delivered to the buyer and the property is to vest in the buyer at a subsequent time, upon the payment of part or all of the price, or upon the performance of any other condition or the happening of any contingency …."

b) "[A]ny contract for the bailment or leasing of an aircraft … by which the bailee or lessee contracts to pay as compensation a sum substantially equivalent to the value thereof, and by which it is agreed that the bailee or lessee is bound to become, or has the option of becoming, the owner thereof upon full compliance with the terms of the contract. The buyer, bailee, or lessee shall be deemed to be the person by whom any such contract is made or given."

5) Conveyance is defined in the FA Act as "a bill of sale, contract of conditional sale, mortgage, assignment of mortgage, or other instrument affecting title to, or interest in, property."

6) Operation of aircraft or operate aircraft is defined in the FA Act as "… the use of aircraft, for the purpose of air navigation and includes the navigation of the aircraft. Any person who causes or authorizes the operation of aircraft, whether with or without the right of legal control (in the capacity of owner, lessee, or otherwise) of the aircraft, shall be deemed to be engaged in the operation of the aircraft within the meaning of this Act."

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7) Operational control is defined in 14 CFR as "with respect to a flight, … the exercise of authority over initiating, conducting, or terminating a flight."

8) In a wet lease the lessor normally exercises operational control. There may be situations during which the lessor provides the aircraft and flightcrew (pilots and Flight Engineer (F/E)), but the lessee provides the cabin crew (Flight Attendants (F/A)). In this case, the lease would be a wet lease.

B. Regulatory Authority. Section 91.23 establishes truth-in-leasing requirements in leases and conditional sales contracts of large civil aircraft of U.S. registry.

1) Illegal and unsafe operations may occur when leases or contracts do not specify who is legally responsible for operational control of the aircraft. In some cases, the lessee may be aware of his or her responsibility for operational control of the aircraft but does not recognize responsibility for compliance with 14 CFR.

2) Some owners of large airplanes may attempt to evade complying with the certification and operating requirements of 14 CFR part 121, 125, or 135 by using devious leases or conditional sales contracts. Usually this attempt appears as though the lessee or conditional buyer has operational control of the aircraft, when, in fact, he or she does not. This assumption of responsibility creates a safety problem and can involve legal liability.

3) To engage legitimately in "charter" service for compensation or hire, a company must be certificated as an air carrier or commercial operator. The inspector's primary concern in processing or evaluating an aircraft lease or contract is determining evidence of operational control and that common carriage is not involved. Evasively worded lease agreements should be questioned and brought to the attention of the regional counsel.

4) The regulation requires that the lease identify the maintenance program that the aircraft has been under for the preceding 12 months and the person or parties considered responsible for operational control of the aircraft. A copy of the agreement is required to be carried in the aircraft during all operations conducted under the terms of the lease or contract.

3-499 NOTIFICATION. Unless otherwise authorized, the operator is required to give the district office (nearest to the airport where the lease or contract flight will originate) a 48-hour advance notification of the flight.

A. Method. Notification is usually either by telephone or in person.

B. Deviation. To provide some relief in cases where the 48-hour notification requirement would create a hardship, the office manager may allow receipt of notification in less time. Factors to be considered in doing so are:

1) Inspector availability.

2) Location of departure airport.

3) Results of prior surveillance of the proposed operator.

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C. Required Information. Under § 91.23, the following information must be provided to the district office:

1) Location of the airport.

2) Departure time.

3) Registration number of aircraft involved.

D. Planning Information. The district office needs the following information for planning purposes:

1) Who is going to fly the aircraft (crew names, if known)?

2) Where the aircraft is presently located?

3) Aircraft destination and en route stops, if any.

4) Nature of mission (cargo, passenger, or both).

5) Where and when the aircraft can be seen before departure?

6) Type of aircraft.

7) Who is the lessee?

8) Who is the lessor?

9) Name of the person or parties considered to be responsible for operational control of the aircraft.

10) Type of inspection and maintenance program the aircraft has been under during the preceding 12 months.

11) Status of compliance with applicable maintenance and inspection requirements.

3-500 FACTORS TO BE CONSIDERED AFTER RECEIPT OF A LEASE NOTIFICATION. The inspector, in coordination with the office manager, is in the best position to decide if a ramp inspection is necessary. Not all lease notifications require an inspection. The following suggestions may assist in evaluating a lease notification to determine if an inspection is necessary.

A. Personal Knowledge of the Lessee or Lessor. No purpose would be served in conducting a ramp inspection of an aircraft leased from an owner that the district office knows to have a good compliance and safety record.

B. Personnel Qualifications. Effective ramp inspections can be conducted without the inspector being personally qualified in or familiar with the aircraft involved. However, if there is reason to suspect either the condition of the aircraft or the qualifications of the flightcrew,

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personnel should be assigned who have the expertise to conduct the appropriate inspection. At times, it might be necessary to request outside assistance from the appropriate Regional Office (RO).

C. Type of Mission. It may be appropriate to give greater consideration toward conducting a ramp inspection of an aircraft involved in passenger carrying operations than one limited to cargo only.

D. Type of Inspection and Maintenance Program. A determination should be made as to the type of inspection and maintenance program the aircraft has been under during the preceding 12 months. If the aircraft is currently maintained under a known program, such as a continuous airworthiness inspection program of a part 121 operation or an approved aircraft inspection program of a part 135 operator, there may be little need for an airworthiness inspection. If the aircraft has been operated as a public aircraft immediately preceding the current lease agreement, consideration should be given to an inspection to determine if the airworthiness certificate is still valid.

E. Conduct of Ramp Inspections. If a ramp inspection is to be conducted, the inspector should also follow the procedures in Volume 6, Chapter 1, Section 4, Conduct a Part 91 Ramp Inspection.

3-501 ALLOWABLE COMPENSATION. The lessor may charge for the aircraft and services as provided in part 91 subpart D. The lessor does not need to be certificated under part 121, 125, or 135.

3-502 PART 91 SUBPART F. Section 91.501 prescribes those operations of large and turbine-powered U.S. civil airplanes and allows certain compensation and charges without requiring certification under part 121, 125, or 135. Additionally, certain small aircraft (less than 12,500 pounds) may be operated under part 91 subpart F through an exemption issued to the National Business Aircraft Association (NBAA).

A. Corporate Aircraft. In general, the use of corporate aircraft is noncommercial in nature and a corporation may make charges to subsidiaries, affiliates, or divisions for the use of the aircraft incidental to and within the scope of its business. The key element here is that the aircraft operator does not engage in common carriage (i.e., “holding out” to the public).

B. Types of Agreements. There are three types of agreements in which certain compensatory charges may be allowed.

1) A time-sharing agreement means an arrangement whereby a person leases an airplane with a flightcrew to another person. No charge is made for the flight conducted under that arrangement other than for the items listed in § 91.501(d). Absent from the list are pilot salaries, a pro rata share of the overhead, hangar and maintenance expenses, and interest or amortization costs for the airplane. The Federal Aviation Administration (FAA) feels that permitting the additional 100 percent of the fuel costs approximates the other overhead costs while limiting the financial return below a profit level.

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a) Time sharing is essentially a wet lease of the aircraft and an agreement or lease is required by regulations. Operational control and the relationship of the parties using the aircraft are the keys to how agreements may be handled. Operational control is deemed to rest with the pilot in command (PIC) and, by extension, to the employer of the pilot. In a wet lease where the pilot is furnished by the owner of the aircraft, that pilot is deemed in operational control.

b) The FAA requires that a copy of any operating agreement or lease covering operations under time sharing (and also interchange) be mailed to the FAA Civil Aviation Registry (AFS-700), P.O. Box 25724, Oklahoma City, OK 73125, within 24 hours of its execution. In addition, a copy of the lease, contract, or agreement should be carried in the aircraft when the aircraft is being operated under the terms of the lease or agreement (§ 91.23). This does not imply the need for FAA approval either before or ultimately for the terms of the contract. Filing is for record purposes only.

2) An interchange agreement means an arrangement whereby a person leases an airplane to another person in exchange for equal time, when needed, on the other person's airplane or for a monetary payment that does not exceed the difference between the cost of owning, operating, and maintaining the exchanged airplanes.

a) Interchange covers the case where a company that operates an airplane wishes to borrow another company's airplane for a trip. The agreement can provide for the mutual exchange of airplanes and crews with provisions to equalize the expenses with an appropriate payment. For instance, a company using a business jet can interchange use of the aircraft with a company using a turboprop airplane. Total costs per hour of use would be different and payment is allowed to compensate for the cost differential.

b) The provisions for recording an interchange agreement are the same as for time sharing.

3) A joint-ownership agreement means an arrangement whereby one of the registered owners of an airplane employs and furnishes the flightcrew for that airplane and each of the other registered owners pays a share of the charges specified in the agreement between the owners.

a) Under joint ownership, an agreement may be reached as to the percentage of ownership and location of operational control. Two companies can agree to purchase the airplane and share it 60 – 40 with the pilot, maintenance, etc., being the responsibility of one company. That company is deemed to exercise operational control by the FAA. All costs for owning, operating, and maintaining the aircraft can be divided according to the agreement.

b) The joint owners must file joint-ownership records with the FAA Aircraft Registration Branch (AFS-750), P.O. Box 25504, Oklahoma City, OK 73125-0504, and secure the appropriate registration for the airplane. Failure to file the appropriate title and bill of sale showing joint ownership can be considered a violation of the rule.

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3-503 SECURITY OF LEASES/AGREEMENTS. The lease or agreement furnished by an operator may contain sensitive commercial or financial information. It is, therefore, privileged and confidential and will not be made available to the public or copied by the inspector.

3-504 PREREQUISITES AND COORDINATION REQUIREMENTS.

A. Prerequisites. This task requires knowledge of the regulatory requirements of part 91 and FAA policies and qualification as an aviation safety inspector (ASI) (Operations).

B. Coordination. This task may require coordination with the Regional Counsel, Airmen Certification Branch (AFS-760), and AFS-750.

3-505 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Title 14 CFR Parts 1; 61; 63; 67; 91, §§ 91.23 and 91.501; 121; 125; and 135.
- Advisory Circular (AC) 91-37, Truth in Leasing.
- FAA Order 8720.1, Truth in Leasing Notification (FAR Section 91.23).
- PTRS Field Office Manual.

B. Forms. FAA Form 8000-36, Program Tracking and Reporting System Data Sheet.

C. Job Aids. Sample letters and figures.

3-506 PROCEDURES.

A. Request Lease. After being notified that a lease has been agreed upon, request a copy of the lease. Inform the lessee that he or she can either mail the copy or bring it in personally to the district office.

B. PTRS. Open the PTRS file.

C. Review Lease. Review the lease (see Figure 3-64, Sample Lease) to determine compliance with § 91.23. Check for:

- Aircraft maintenance program.
- Operational control of aircraft.
- Name and address of operator.
- Not contrary to part 121, 125, or 135 applicability.
- Signature certifying acknowledgment of responsibilities.

D. Lease Not in Compliance. Return the lease to the operator. Inform the operator in writing (see Figure 3-65, Sample Letter Informing Operator of Needed Corrections in Lease) of the corrections needed for compliance.

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E. Lease in Compliance. If the lease is in compliance with § 91.23, inform the district office manager that the lease is in compliance. Determine whether a ramp inspection is necessary, taking into account the following:

- Whether the aircraft owner (the lessor) has a good compliance and safety record known to the office manager.
- Availability of qualified inspectors to conduct the inspection.
- Type of operation to be conducted (passenger carrying or cargo carrying).
- Type of inspection and maintenance program the aircraft has been under during the preceding 12 months.

F. Conduct the Ramp Inspection. If a ramp inspection is necessary, see Volume 6, Chapter 1, Section 4.

G. Questions Concerning Compliance. If there are still questions regarding either the lease format or who has specific operational control of the aircraft, contact the Regional Counsel for guidance and proceed with the Counsel's instructions.

H. Forward the Report. If the aircraft is not based in the inspector's district, forward a copy of the PTRS report to the appropriate district office.

I. File the Lease Agreement. File the lease agreement (and the job aid, if applicable) according to office procedures.

J. PTRS Report. Complete FAA Form 8000-36, Program Tracking and Reporting System Data Sheet.

3-507 TASK OUTCOMES. Successful completion of this task results in either:

- An approved lease, or
- A disapproved lease.

3-508 FUTURE ACTIVITIES.

- Process additional leases from operator.
- Future ramp inspections involving the lessee.
- Possible enforcement investigation.

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Figure 3-64. Sample Lease

_____(insert type, model and registration number of airplane, such as Convair 240; N124W) HAS BEEN MAINTAINED AND INSPECTED UNDER____(insert 14 CFR part 91 or 14 CFR part 121 as appropriate) FROM____TO____(insert date of execution of lease or contract after the word "to"; then go back 12 months and under 14 CFR part 121 during other parts of the 12 months, the dates and the 14 CFR part under which it was maintained for each period should be specified.)

IT WILL BE MAINTAINED AND INSPECTED UNDER____(insert 14 CFR Part 91 or 14 CFR part 121 as appropriate) FOR OPERATIONS TO BE CONDUCTED UNDER THIS____(insert lease OR contact of conditional sale, whichever is correct).

_____(insert name and address of individual, company, or corporation) IS CONSIDERED RESPONSIBLE FOR OPERATIONAL CONTROL OF ALL AIRCRAFT IDENTIFIED AND TO BE OPERATED UNDER THIS____(insert lease or contract of conditional sale).

AN EXPLANATION OF THE FACTORS BEARING ON OPERATIONAL CONTROL AND THE PERTINENT REGULATIONS CAN BE OBTAINED FROM THE NEAREST FAA FLIGHT STANDARDS DISTRICT OFFICE.

I, THE UNDERSIGNED____(insert name and address of responsible party) CERTIFY THAT I AM RESPONSIBLE FOR OPERATIONAL CONTROL OF THE AIRCRAFT AND THAT I UNDERSTAND MY RESPONSIBILITIES FOR COMPLIANCE WITH APPLICABLE REGULATIONS.

_____ _____
Signature and Title (lessor) Date and time of execution

_____ _____
Signature and Title (lessee) Date and time of execution

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Figure 3-65. Sample Letter Informing Operator of Needed Corrections in Lease

FAA LETTERHEAD

[DATE]

[APPLICANT'S NAME AND ADDRESS]

Dear ____:

We have reviewed the lease which you submitted for [identify aircraft by make, model, and N-number]. We are unable to process the lease until corrections are made to the following clauses to bring them into compliance with 14 CFR part 91, § 91.23:

List all unsatisfactory clauses and their appropriate 14 CFR references.

If you require assistance in adjusting the above clauses, please contact this office at [include the telephone number and operating hours of the district office].

Sincerely,

[Signed by the reviewing inspector]

RESERVED. Paragraphs 3-509 through 3-525.

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VOLUME 3 GENERAL TECHNICAL ADMINISTRATION

CHAPTER 18 OPERATIONS SPECIFICATIONS

Section 5 Part C Operations Specifications—Airplane Terminal Instrument Procedures and Airport Authorizations and Limitations

3-871 GENERAL. Part C is issued to operators who conduct Title 14 of the Code of Federal Regulations (14 CFR) part 91, 91 subpart K (part 91K), 121, 125 (including 125 Letter of Deviation Authority (LODA) holders), or 135 operations with fixed-wing airplanes. It is not issued to part 135 operators who only conduct helicopter operations. Instrument flight rules (IFR) helicopter operators are issued Part H. Part C is not usually issued to part 135 on-demand operators who are restricted to visual flight rules (VFR)-only operations. In rare situations, operations specification (OpSpec) C070 is issued to part 135 VFR-only operators who are authorized to conduct commuter operations.

NOTE: All 300-series and nonstandard 500-series OpSpecs/management specifications (MSpecs)/training specifications (TSpecs)/letters of authorization (LOA) (Parts A, B, C, D, E, and H) require approval by the appropriate headquarters (HQ) policy division. Title 14 CFR parts 61, 91, 91K, 125 (including the 125 LODA holders), 133, 137, and 141 operators' nonstandard operational requests must be approved by the General Aviation and Commercial Division (AFS-800). Title 14 CFR parts 121, 135, and 142 nonstandard operational requests must be approved for issuance by the Air Transportation Division (AFS-200). Title 14 CFR parts 121, 135, and 145 repair station and all airworthiness nonstandard requests must be approved by the Aircraft Maintenance Division (AFS-300). All Weather Operations (AWO) relating to instrument procedures must be approved by the Flight Technologies and Procedures Division (AFS-400) and AFS-200 or AFS-800, as appropriate. Nonstandard authorizations for 14 CFR part 129 foreign operators require approval from the International Programs and Policy Division (AFS-50).

NOTE: All text added to an OpSpec/MSpec/TSpec or LOA through the use of nonstandard text entered in the nonstandard text block (sometimes referred to as "Text 99") must also be approved by the appropriate HQ policy division. For detailed guidance on the process for obtaining HQ approval for nonstandard authorizations, principal inspectors (PI) must read the guidance contained in Volume 3, Chapter 18, Section 2.

OPSPEC/MANAGEMENT SPECIFICATION (MSPEC)/LETTER OF AUTHORIZATION (LOA) C048—ENHANCED FLIGHT VISION SYSTEM (EFVS) USE ON STRAIGHT-IN INSTRUMENT APPROACH PROCEDURES OTHER THAN CATEGORY II OR CATEGORY III.

A. Authorization. The C048 authorization is optional for certificate holders/operators/program managers conducting airplane operations under 14 CFR parts 91 subpart K (part 91K), 121, 125 (including the Letter of Deviation Authority (LODA)

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125 operators), and 135. C048 authorizes approach to straight-in landing operations below Decision Altitude (DA) or minimum descent altitude (MDA) using a certified enhanced flight vision system (EFVS). C048 is applicable to certificate holders/operators/program managers conducting straight-in instrument approach procedures (IAP) other than Category II Approach (CAT II) or Category III Approach (CAT III), as follows:

1) OpSpec C048 is required to be issued to air carriers conducting operations under parts 121, 135, and 121/135 split certificates using the provisions specified in C048.

2) OpSpec C048 is required to be issued to certificated operators that operate under part 125 using the provisions specified in C048.

3) LOA C048 is required to be issued to operators conducting operations under part 125 that are issued a deviation from the certificate and OpSpec requirements of part 125 (125M) and who will use the provisions specified in C048.

4) MSpec MC048 is required to be issued to those program managers conducting operations under part 91K who will use the provisions specified in C048.

5) An LOA is not required to be issued to part 91 operators (except for part 91K operators who must be issued an MSpec). Part 91 operators are authorized by the regulations to conduct EFVS operations without being issued an LOA.

B. Regulations. Part 91, § 91.175(l) and (m) authorize an EFVS to be used to descend below DA or MDA on straight-in IAPs, other than CAT II or CAT III. These regulations require that the EFVS have a Federal Aviation Administration (FAA) type design approval (type certificate (TC) or Supplemental Type Certificate (STC)), or for foreign-registered aircraft, that the EFVS complies with all of the EFVS requirements of the U.S. regulations. An EFVS uses imaging sensor technologies to provide a real-time enhanced image of the forward external visual scene to the pilot. An EFVS is used by the pilot to determine that the enhanced flight visibility is not less than the visibility prescribed in the IAP to be flown and that the required visual references for descending below DA or MDA down to 100 feet above the touchdown zone elevation (TDZE) are distinctly visible and identifiable using the sensor image when the runway environment is not visible using the pilot's natural vision. EFVS also helps to verify proper runway alignment at night and in low visibility conditions.

NOTE: The authorization associated with this OpSpec, MSpec, or LOA is in keeping with the intent of § 91.175(l) and (m) and does not authorize EFVS to be used to satisfy the § 91.175(e)(2) requirement that an identifiable part of the airport be distinctly visible to the pilot during a circling maneuver at or above MDA, or while descending below MDA. EFVS is permitted to be used to identify the required visual references in order to descend below DA or MDA on straight in IAPs only. An instrument approach with a circle-to-land maneuver is not a straight-in IAP and does not have straight-in minima. While the regulations do not prohibit EFVS from being used during any phase of flight, they do prohibit it from being used for operational credit on anything but a straight-in IAP. EFVS may be used during a circle-to-land maneuver provided the visual references

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required at or above MDA and throughout the circling maneuver are distinctly visible using natural vision. Use of EFVS during a circling maneuver may enable a pilot to see much more of the external scene at night and in low visibility conditions than would be possible using natural vision, thereby enhancing situational awareness (SA).

C. Descending Below DA or MDA. In order to descend below DA or MDA, the following visual references for the runway of intended landing must be distinctly visible and identifiable to the pilot using the EFVS:

1) The Approach Light System (ALS) (if installed); or

2) The following visual references in both subparagraphs C2)a) and b) below:

a) The runway threshold, identified by at least one of the following:

1. The beginning of the runway landing surface,

2. The threshold lights, or

3. The runway end identification lights (REIL).

b) The touchdown zone (TDZ), identified by at least one of the following:

1. The runway TDZ landing surface,

2. The TDZ lights,

3. The TDZ markings, or

4. The runway lights.

3) To descend below 100 feet above the TDZE of the runway of intended landing, the pilot must be able to see the visual references required by § 91.175(l)(4) with his or her natural vision without relying on the EFVS. That is, the enhanced flight visibility observed by use of an EFVS is no longer applicable. At this point, the flight visibility only has to be sufficient for the pilot to distinctly see and identify the lights or markings of the threshold or the lights or markings of the TDZ using natural vision before continuing to a landing.

D. Required Visual References. The required visual references in § 91.175(l) using EFVS to descend below DA or MDA are different from those required by § 91.175(c) using natural vision. Table 3-15A, Required Visual References, Part 91, § 91.175(c) and (l), provides a comparison of visual reference requirements for both natural vision and EFVS. Generally, the visual reference requirements for EFVS are more stringent than those for natural vision. For example, § 91.175(c) allows descent below DA or MDA using natural vision when only one of the visual references listed can be seen. For EFVS, § 91.175(l) requires that a pilot either see the ALS or at least one visual reference listed for the threshold environment and one visual reference listed for the TDZ environment. When natural vision is used, the Visual Approach

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Slope Indicator (VASI) is permitted to be used as a required visual reference for descent below DA or MDA. Under § 91.175(l) using EFVS, however, the VASI cannot be used as a visual reference for descent below DA or MDA using EFVS because the EFVS display is monochromatic. For descent below 100 feet above TDZE using natural vision, § 91.175(c)(3) permits the approach lights to be used as a reference only if the red terminating bars or the red side row bars are visible and identifiable. For EFVS operations below 100 feet above TDZE, the approach lights with red side row bars are not permitted to be used as a visual reference, even though the pilot is required to rely only on natural vision to descend below 100 feet above TDZE. The only visual references permitted to be used for EFVS operations below 100 feet above TDZE are the lights or markings of the threshold or the lights or markings of the TDZ.

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Table 3-15A. Required Visual References, Part 91, § 91.175(c) and (l)

Required Visual References Using ***Natural Vision*** **(14 CFR 91.175(c))**	**Required Visual References Using an** ***Enhanced Flight Vision System*** **(14 CFR 91.175(l))**
For operation below DA or MDA: At least **one** of the following visual references: Approach light system Threshold Threshold markings Threshold lights Runway end identifier lights Visual approach slope indicator Touchdown zone Touchdown zone markings Touchdown zone lights Runway Runway markings Runway lights	**For operation below DA or MDA:** The following references, using the EFVS: Approach light system ***OR*** BOTH paragraphs A and B -- A. The runway threshold, identified by at least one of the following – • beginning of the runway landing surface, • threshold lights, or • runway end identifier lights **AND** B. The touchdown zone, identified by at least one of the following – • runway touchdown zone landing surface, • touchdown zone lights, • touchdown zone markings, or • runway lights.
Descent below 100 feet height above TDZE: At least **one** of the following visual references: Approach light system, as long as the red terminating bars or red side row bars are also distinctly visible and identifiable Threshold Threshold markings Threshold lights Runway end identifier lights Visual approach slope indicator Touchdown zone Touchdown zone markings Touchdown zone lights Runway Runway markings Runway lights	**Descent below 100 feet height above TDZE:** The following references, using natural vision: The lights or markings of the threshold ***OR*** The lights or markings of the touchdown zone

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E. Conditions of Approval. Before issuing C048 based on aircraft equipment and operation, inspectors shall ensure that each certificate holder/operator/program manager meets the following conditions:

1) The authorized aircraft must be equipped with an EFVS certified for conducting operations under § 91.175(l) and (m) and must either have an FAA type design approval (TC or STC) or, for a foreign-registered aircraft, the EFVS must comply with all of the EFVS requirements of the U.S. regulations. Field approvals for EFVS installations are not authorized. An EFVS is an installed airborne system and must include:

a) A head-up display (HUD) or equivalent display.

1. EFVS sensor imagery and aircraft flight symbology must be presented so that they are clearly visible to the Pilot Flying (PF) in his normal position, line of vision, and looking forward along the flightpath.

2. The EFVS display must be conformal. That is, the sensor imagery, aircraft flight symbology, and other cues that are referenced to the imagery and external scene must be aligned with and scaled to the external view.

b) Sensors that provide a real-time image of the forward external scene topography.

c) Computers and power supplies.

d) Indications and controls.

e) Aircraft flight symbology that includes at least the following:

1. Airspeed,

2. Vertical Speed (VS),

3. Aircraft attitude,

4. Heading,

5. Altitude,

6. Command guidance as appropriate for the approach to be flown,

7. Path deviation indications,

8. Flight Path Vector (FPV) cue, and

9. Flight Path Angle (FPA) reference cue.

NOTE: The FPA reference cue must be displayed with the pitch scale and must be selectable by the pilot for the appropriate approach descent angle.

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NOTE: An EFVS must not be confused with an Enhanced Vision System (EVS). An EVS is an electronic means to provide the flightcrew with a sensor-derived or enhanced image of the external scene (e.g., millimeter wave radar, Forward Looking Infrared (FLIR)). Unlike an EFVS, an EVS does not necessarily provide the additional flight information/symbology required by § 91.175(m). An EVS might not use an HUD and might not be able to present the image and flight symbology in the same scale and alignment as the outside view. This system can provide SA to the pilot, but does not meet the regulatory requirements of § 91.175(m). As such, an EVS cannot be used as a means to determine enhanced flight visibility and descend below the DA or MDA.

2) The pilot can continue the approach below DA or MDA to 100 feet above the TDZE if he or she determines that the enhanced flight visibility observed by the use of a certified EFVS is not less than the minimum visibility prescribed in the straight-in IAP being flown, and the pilot acquires the required visual references prescribed in § 91.175(l)(3). The pilot uses the EFVS to visually acquire the runway environment, confirm lateral alignment, maneuver to the extended runway centerline (RCL), and continue a normal descent from the DA or MDA to 100 feet above the TDZ.

a) A pilot may continue the approach below 100 feet above the TDZE as long as the flight visibility, using natural vision, is sufficient for the required visual references to be seen. In addition, the aircraft must be continuously in a position from which a descent to landing can be made on the intended runway, at a normal rate of descent using normal maneuvers, and for part 121 and 135 certificate holders, at a descent rate that allows touchdown to occur within the TDZ.

b) It should be noted that the rule does not require the EFVS to be turned off or the sensor image to be removed from the HUD in order to continue to a landing without reliance on the EFVS sensor image. In keeping with the requirements of the regulations, however, the decision to continue descending below 100 feet above the TDZE must be based on seeing the visual references required by the rule through the HUD by means of natural vision. An operator may not continue to descend beyond this point by relying on the sensor image displayed on the HUD.

c) EFVS equipage may vary. Some aircraft may be equipped with a single EFVS display. Others may have an EFVS display and a separate repeater display located in or very near the primary field of view (FOV) of the non-flying pilot. Still others may be equipped with dual EFVS displays. The regulations do not require a repeater display or a separate EFVS for the non-flying pilot, but neither do they preclude it. Certificate holders, operators, or program managers should develop procedures for EFVS operations appropriate to the equipment installed and the operation to be conducted. In establishing these procedures, both normal and abnormal or failure modes must be addressed for the various phases of the approach (e.g., before final approach fix (FAF), FAF to DA or MDA, and after reaching DA or MDA).

d) Procedures should support appropriate levels of crew coordination with special emphasis on the transition to and reliance on natural vision. Each EFVS has a specified limit to the FOV. An offset final approach or crosswinds may affect use of the EFVS as well as

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when the decision is made to rely on natural vision for the primary reference. Also, specific pilot/crew decisionmaking and coordination must be addressed in the segment from FAF to DA or MDA (or point that a decision to rely on natural vision is made) and the EFVS segment (from DA or MDA down to 100 feet height above TDZE). The transition from enhanced vision to natural vision for landing is an especially important segment. Certificate holders, operators, or program managers should describe how common SA will be achieved—either procedurally when a single EFVS is used or through a combination of procedures and equipment when a repeater display or dual EFVSs are used.

3) Training requirements with respect to aircraft type (make, model, and series (M/M/S)) and EFVS model/version shall be accomplished in accordance with the Flight Standardization Board (FSB) report for the aircraft and EFVS equipment to be used. If an FSB report was not issued for a specific aircraft type and EFVS model/version, initial EFVS training shall be accomplished in the aircraft type and EFVS model/version to be used, and additional training shall be accomplished when a different EFVS model/version is used on the same aircraft type or when the same EFVS model/version is used on a different make aircraft. It should be noted that the sensor image, fidelity, characteristics, and symbology may differ, necessitating additional training. The flightcrew must be trained in the use of EFVS and demonstrate proficiency conducting straight-in IAPs, other than CAT II or CAT III (e.g., Category I Approach (CAT I) instrument landing system (ILS), nonprecision, approach procedures with vertical guidance (APV), etc.). Part 91K, 121, and 135 operators must have approved training programs. Part 125 operators are not required to have an approved training program. However, pilots of part 125 operators must complete an EFVS training program and must be qualified for EFVS operations by a check airman or an FAA inspector.

a) Pilots should demonstrate knowledge of the regulatory requirements of § 91.175 and part 121, § 121.651, part 125, § 125.381, or part 135, § 135.225, as appropriate, for approach to straight-in landing operations below DA or MDA using an EFVS.

b) Pilots operating an EFVS should be able to demonstrate knowledge and proficiency in the use of this equipment through training and checking as required by the type of operation. As a minimum, pilots should be knowledgeable and proficient in the following areas:

1. The specific sensor technology to include limitations that impact enhanced vision under various environmental conditions (weather, system resolution, external interference, thermal characteristics, variability and unpredictability of sensor performance, etc.).

2. EFVS operational considerations:

- Use of HUD symbology.
- Preflight and warmup requirements, as applicable.
- Controls, modes, adjustments, and alignment of the EFVS/HUD.
- Importance of the Design Eye Position (DEP) in acquiring the proper EFVS image.
- System limitations and normal and abnormal procedures, including visual anomalies such as noise, blooming, and thermal crossover.

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- Use of EFVS on precision, nonprecision, and APV approaches.
- Use of caged and uncaged modes of the EFVS, if applicable, in crosswind conditions.

3. Impact of EFVS on other aircraft systems, such as autopilot minimum use height limitations.

4. Runway lightning systems and ALS.

5. Crew briefings, callouts, and crew coordination procedures.

6. Visual references required by § 91.175(l)(3) and (4).

7. Transition from EFVS imagery to natural vision and recognition of the required visual references.

8. Obstacle clearance requirements for approach and missed approach:

- Flight planning for obstacle clearance on a missed approach (e.g., go-around or balked landing) below DA or MDA;
- Use and significance of a published vertical descent angle (VDA) on IAPs;
- Vertical Path (VPATH), VASI, precision approach path indicator (PAPI), published visual descent points (VDP), calculated VDPs; and
- Use of the FPA reference cue and FPV cue.

9. Missed approach requirements include: loss of required equipment, enhanced flight visibility, or required visual references for various phases of the approach (e.g., FAF to DA or MDA, and after passing DA or MDA).

c) The flightcrew shall not conduct any operations authorized by this paragraph unless they are trained and qualified in the equipment and special procedures to be used. Each pilot in command (PIC) and second in command (SIC) must successfully complete an approved EFVS training program for parts 91K, 121, and 135 operators or a training program for part 125 operators, and must be certified as being qualified for EFVS operations by one of the certificate holder/operator/program manager's check airmen who is properly qualified for EFVS operations or an FAA inspector.

4) The Aircraft Flight Manual (AFM) must contain EFVS provisions appropriate to the EFVS operation authorized.

5) The minimum equipment list (MEL) should include EFVS provisions, if MEL relief for EFVS is sought.

6) Part 121 and 135 operators must incorporate into their maintenance program the EFVS manufacturer's requirements for maintenance and instructions for continued airworthiness. Part 91K and 125 operators must maintain the installed EFVS equipment in

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accordance with the aircraft manufacturer's or the equipment manufacturer's maintenance instructions.

OPSPEC/MSPEC C049—DESTINATION AIRPORT ANALYSIS.

A. General. OpSpec C049 is an optional authorization for 14 CFR part 135 certificate holders that have been issued OpSpec A057 as an eligible on-demand operator for reducing effective runway length requirements for turbine-engine powered, large transport-category airplanes that must be met before a flight's release, provided certain requirements are met by the operator. MSpec C049 is an optional authorization for 14 CFR part 91 subpart K (part 91K) fractional ownership operations program managers to reduce effective runway length requirements for turbine-engine powered, large transport-category airplanes that must be met before a flight's release, provided the program manager meets certain requirements.

B. Destination Airport Analysis. FAA regulations governing operations under parts 91K and 135 provide for reducing effective runway length requirements for turbine-engine powered, large transport-category airplanes that must be met before a flight's release, provided the operator meets certain requirements. For destination airports, normal landing distance requirements for part 91K and 135 operations are 60 percent of the available runway length. For alternate airport landing distance requirements, part 91K remains at 60 percent, while part 135 allows for 70 percent of the effective runway length. If an operator desires to reduce such requirements below 60 percent of the available runway length, that operator must meet regulatory requirements in two areas:

1) Part 135 eligible on-demand operator (OpSpec A057 must be issued) or part 91K program experience; and

2) FAA-approved Destination Airport Analysis Program (DAAP). The DAAP must address specific regulatory requirements and be approved for use through that operator's MSpecs or OpSpecs, as applicable.

C. Experience Requirements. An eligible on-demand operator is defined in part 135, § 135.4. Fractional ownership programs must meet the same requirements and are identified in part 91, §§ 91.1053 and 91.1055. The requirements include an on-demand or fractional ownership program operation that meets the following requirements:

1) Two-Pilot Crew. The flightcrew must consist of at least two qualified pilots employed or contracted by the certificate holder.

2) Flightcrew Experience. The crewmembers must have met the applicable requirements of 14 CFR part 61 and have the following experience and ratings:

a) Total flight time for all pilots:

- Pilot in command (PIC)—A minimum of 1,500 hours.
- Second in command (SIC)—A minimum of 500 hours.

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b) For multiengine, turbine-powered fixed-wing, and powered-lift aircraft, the following FAA certification and ratings requirements:

- PIC—Airline transport pilot (ATP) and applicable type ratings.
- SIC—Commercial pilot and instrument ratings.

c) For all other aircraft, the following FAA certification and rating requirements:

- PIC—Commercial pilot and instrument ratings.
- SIC—Commercial pilot and instrument ratings.

3) Pilot Operating Limitations. If the SIC of a fixed-wing aircraft has fewer than 100 hours of flight time as SIC flying in the aircraft make and model, a type rating is required in the type of aircraft being flown, and the PIC is not an appropriately qualified check pilot, the PIC will make all takeoffs and landings in any of the following situations:

a) Landings at the destination airport when a Destination Airport Analysis is required by part 135, § 135.385(f); and

b) In any of the following conditions:

- The prevailing visibility for the airport is at or below three-quarters of a mile;
- The Runway Visual Range (RVR) for the runway to be used is at or below 4,000 feet;
- The runway to be used has water, snow, slush, ice, or similar contamination that may adversely affect aircraft performance;
- The braking action on the runway to be used is reported to be less than “good”;
- The crosswind component for the runway to be used is in excess of 15 knots;
- Wind shear is reported in the vicinity of the airport; and
- Any other condition in which the PIC determines it to be prudent to exercise the PIC’s authority.

4) Crew Pairing. Either the PIC or the SIC must have at least 75 hours of flight time in that aircraft make or model and, if a type rating is required for that type aircraft, either as PIC or SIC.

D. Deviations. The Administrator may authorize deviations from the total flight time requirements of § 91.1053(a)(1) or crew pairing requirements of § 91.1055(b) if the FAA office that issued the OpSpecs or MSpecs, as applicable, finds that the crewmember has comparable experience and can effectively perform the functions associated with the position in accordance with the requirements of this chapter. The Administrator may, at any time, terminate any grant of deviation authority issued under this provision. Grants of deviation may be authorized after consideration of the size and scope of the operation, the qualifications of the intended operating pilots, and the following circumstances:

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1) A newly authorized certificate holder does not employ any pilots who meet the minimum requirements of § 91.1055(b).

2) An existing certificate holder adds to its fleet a new category and class aircraft not used before in its operation.

3) An existing certificate holder establishes a new base to which it assigns pilots who will be required to become qualified on the aircraft operated from that base.

E. DAAP Requirements. DAAP requirements are found in §§ 91.1025 and 135.23. Specifically, if required by § 91.1037(c) or § 135.385, as applicable, the Destination Airport Analysis establishing runway safety margins must include the following elements, supported by aircraft performance data supplied by the aircraft manufacturer for the appropriate runway conditions at the airport(s) to be used, if a reduction below 60 percent of the available runway length is planned:

1) Pilot Qualifications and Experience. The operator is responsible for including all applicable regulatory requirements to establish a pilot's eligibility to reduce effective runway planning requirements below 60 percent of the available runway length. Experience requirements address pilots with less than 100 hours of flight time in type (high minimum), total flight time, and crew pairing limitations (less than 75 hours in type).

2) Aircraft Performance Data to Include Normal, Abnormal, and Emergency Procedures as Supplied by the Aircraft Manufacturer. Landing distance calculations should be completed using FAA-approved procedures and data. Consideration must be given to abnormal and emergency procedures, as some of these procedures may increase approach speeds and consequently, landing distance requirements. Additionally, planned takeoff weight for the departure from that airport should be evaluated before operating into that airport.

3) Airport Facilities and Topography. Consider what services are available at the airport. Services such as communications, maintenance, and fueling may have an impact on operations to and from that airport. Terrain features may figure prominently in or near a particular airport. High, fast-rising terrain may require special approach or DPs, which may impact performance requirements. For example, an aircraft certification criterion uses a 3.5 degree glideslope angle in computing landing distance data. glideslope angles of 2.5 to 3 degrees are common and have the effect of lengthening actual landing distance. Airports that sit on top of hilly terrain or downwind of mountainous terrain may occasionally experience conditions that include gusty conditions or winds shifting from a headwind to a tailwind. Such conditions are an important consideration during the landing maneuver, particularly during the flare, and increase landing distance requirements.

4) Runway Conditions (including contamination). Runway features, such as slope and surface composition, can cause the actual landing distance to be longer than the calculated landing distance. Wet or slippery runways may preclude reductions from being taken and, in fact, require 115 percent of the distance derived from calculations, whether a reduction was used or not. This distance is calculated by increasing the distance required under dry conditions by an additional 15 percent (i.e., if Aircraft Flight Manual (AFM) data show the actual landing distance

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will be 2,000 feet, the effective runway length required is 3,334 feet using 60 percent in this example; if the runway is expected to be wet or slippery upon arrival, the effective runway length required is 3,834 feet). Braking action always impacts the landing distance required as it deteriorates. Always consider the most current braking action report and the likelihood of an update before the flight's arrival at a particular airport.

5) Airport or Area Weather Reporting. Some airports may not have current weather reports and forecasts available for flight planning. Others may have automated observations for operational use. Still others may depend on a nearby airport's forecast for operations. Area forecasts are also very valuable in evaluating weather conditions for a particular operation. Comparing forecasted conditions to current conditions will lend insight to changes taking place as weather systems move and forecasts are updated. Longer flight segments may lean more heavily on the forecast for the estimated time of arrival (ETA), as current conditions may change significantly as weather systems move. For example, if a flight is planned for 5 hours en route, the current conditions may not provide as much insight as a forecast for the arrival time if a cold front is expected to pass through the area while the flight is en route.

6) Appropriate Additional Runway Safety Margins, If Required. Displaced thresholds, airport construction, and temporary obstacles (such as cranes and drawbridges) may impact runway length available for landing. Notices to Airmen (NOTAM) must be consulted before conducting a flight and are a good source of information on items such as these.

7) Airplane Inoperative Equipment. Thrust reversers, on airplanes so equipped, provide some effect of reducing landing rollout distance. However, they are not considered in landing distance performance requirements and data provided by airplane manufacturers during certification. Rather, they provide an added margin of safety when used. If thrust reversers are inoperable or not installed, that additional safety margin does not exist. Also, their effectiveness is directly related to many factors, including pilot technique, reverser deployment rates, engine speeds, and environmental conditions (e.g., wet or contaminated runways in conjunction with crosswinds). Their actual effectiveness varies greatly. Other airplane systems that directly impact landing distance requirements include antiskid and ground spoilers (if installed), brake and tire condition, and landing flap selection, to name a few.

8) Environmental Conditions. Many environmental conditions directly and indirectly affect actual landing distance requirements. Frontal passage usually causes winds to shift, sometimes causing a tailwind component. Tailwinds generally have a significantly greater impact on landing distance than headwinds. Thunderstorms in the vicinity of airports can introduce wind gusts from different directions, including wind shear, to varying degrees that are difficult to predict in advance or during the actual landing maneuver itself. Density and pressure altitudes also directly impact landing distance requirements. Landing distance tables may take these factors into account. However, variations from planned conditions and actual conditions at time of landing can vary and impact actual landing distance requirements.
Stronger-than-forecasted tailwinds en route can cause the airplane to weigh more than projected, causing the actual landing distance to be longer than planned. If icing conditions were encountered while en route and temperatures above freezing are not reached before landing, any ice remaining behind removal devices or on areas that are not protected add additional weight and drag to the airplane, which in turn requires higher airspeeds and longer landing distances.

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9) Other Criteria That Affect Aircraft Performance. Many other variables affect landing distance. Approach speed, flap configuration, airplane weight, tire and brake condition, airplane equipment, and environmental conditions, to name a few, all directly impact required landing distance. With these and many other factors considered, it is the pilot who must apply them through the use of procedures and technique, the latter being highly variable. While specific additives are provided by manufacturer's landing data, a pilot usually applies techniques acquired through experience in dealing with similar circumstances. Pilots may opt for an especially smooth landing on longer runways by "floating" in ground effect, before touchdown. While possibly yielding a smooth landing, this technique will add to the landing distance requirement, as landing data provided by manufacturer's data through the certification process assumes a touchdown rate of descent of 8 feet per second. The following tables provide additional insight into factors that affect landing distance requirements and policies and procedures addressing them should be included in the operator's FAA-approved DAAP.

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Table 3-16. Reduction of Landing Distance Planning Requirements

GENERAL OPERATIONAL CONSIDERATIONS

Certification Criteria	Operational Consideration	Effect on Safety Margin
3.5 degree glideslope angle	2.5 to 3 degrees typical.	Actual landing distance will be longer than calculated landing distance.
8 ft/s touchdown rate of descent	2 to 4 ft/s typical.	Actual landing distance will be longer than calculated landing distance.
Assumes all approach speed additives bled off before reaching the 50 ft height	5 to 10 knots exceedances not uncommon.	Actual landing distance will be longer than calculated landing distance.
	Longer flare distance (“float”).	Actual landing distance will be longer than calculated landing distance.
	Less-than-full braking effort.	Actual landing distance will be longer than calculated landing distance.
	Delays in obtaining full braking configuration.	Actual landing distance will be longer than calculated landing distance.
	Higher temperatures not accounted for (temperature accountability not required).	Actual landing distance will be longer than calculated landing distance.
	Downhill runway slope not accounted for (runway slope accountability not required).	Actual landing distance will be longer than calculated landing distance.
	Icy, slippery, or contaminated runway surface.	Actual landing distance will be longer than calculated landing distance.
	Airplane heavier at time of landing than predicted at time of dispatch.	Actual landing distance will be longer than calculated landing distance.
	Airplane higher than 50 ft over the threshold.	Actual landing distance will be longer than calculated landing distance.
	Airport pressure altitude higher than predicted at time of dispatch.	Actual landing distance will be longer than calculated landing distance.

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OTHER VARIABLE CONSIDERATIONS

Steady-State Variables	Non Steady-State Variables	Actual Operations vs. Flight Test	Actual vs. Forecast Conditions
Runway slope	Wind gusts/turbulence	Flare technique	Runway or direction (affecting slope)
Temperature	Flightpath deviations	Time to activate deceleration devices	Airplane weight
Runway surface condition (dry, wet, icy, texture)		Flightpath angle	Approach speed
Brake/tire condition		Rate of descent at touch down	Environmental conditions (for example, temperature, wind, pressure altitude)
Speed additives		Approach/touchdown speed	Engine failure
Crosswinds		Height at threshold	
		Speed control	

F. Operator Responsibility. Operators are responsible for preparing their DAAP if they desire to reduce landing distance planning requirements below 60 percent of the effective runway length. Operators must ensure that their policies and procedures reflect at least minimum regulatory requirements and adequate policies and procedures before submitting their program to the FAA for approval.

G. Checklist. The checklist is available electronically in the guidance subsystem of the automated Operations Safety System (OPSS) in association with OpSpec/MSpec C049. The checklist should be used to ensure that the operator and its DAAP meet minimum regulatory requirements. This checklist should be completed by the operator and be provided to the FAA office having approval authority, along with the DAAP and request for approval and issuance of OpSpec C049 or MSpec C049, as applicable.

OPSPEC C050—SPECIAL PILOT IN COMMAND AIRPORT QUALIFICATIONS.

A. General. OpSpec C050 is used to authorize 14 CFR part 121 air carrier certificate holders to conduct instrument flight rules (IFR) operations into special airports requiring special airport qualification in accordance with the provisions and limitations of the OpSpec and part 121, § 121.445. For detailed information refer to Volume 4, Chapter 3, Section 5, paragraph 4-602.

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B. Operations into Special Pilot in Command (PIC) Qualification Airports. Air carriers conducting domestic, flag, and supplemental operations require the PIC to be qualified for operations into special PIC qualification airports. These PICs must be qualified in accordance with § 121.445.

1) OpSpec C050 is used to authorize special PIC qualification airports for domestic, flag, and supplemental part 121 air carriers.

2) The list of special qualification airports can be found in the automated Operations Safety System (OPSS) guidance subsystem in association with OpSpec C050 and at http://fsims.faa.gov/PICResults.aspx?mode=Publication&doctype=OPSS Guidance.

C. PIC Requirements. If both the ceiling and the visibility minimums are not satisfied as detailed in § 121.445(c), then the qualification requirements of § 121.445(b) apply. Section 121.445(b) specifies that for a pilot to serve as PIC on a flight to a special qualification airport, the PIC must have the benefit of one of the following:

1) The PIC, within the preceding 12 calendar-months, has made a takeoff and landing at that airport while serving as a pilot flightcrew member;

2) The second in command (SIC), within the preceding 12 calendar-months, has made a takeoff and landing at that airport while serving as a pilot flightcrew member; or

3) Within the preceding 12 calendar-months, the PIC has qualified by using pictorial means acceptable to the Administrator for that airport.

D. Operator Assessment of Airport Factors. The operator assesses the nature and complexity of certain factors associated with the airport (e.g., high altitude, foreign airport, specific terrain features, unique weather patterns may be present singly or in combination). This assessment determines whether the airport should be included in the air carrier's airport listing in OpSpec C067 or the provisions of OpSpec C050 apply. For instance, an airport with an approved IFR and or visual flight rules (VFR) approach/departure procedure and an unusual characteristic, such as a nearby politically sensitive international boundary or high terrain, may require designation as a special PIC qualification airport. In this case, the airport would need to be listed in OpSpec C067 and the provisions of OpSpec C050 also apply. Refer to Volume 4, Chapter 3, Section 5, paragraph 4-602, and OpSpec C067.

E. Addition and Removal From the Special Airport Qualification List. The air carriers, in conjunction with the Air Transportation Division (AFS-200), will determine any airport additions or deletions from the special airport qualification list. These changes will be made on a quarterly basis.

OPSPEC/MSPEC C051—TERMINAL INSTRUMENT PROCEDURES. C051 is issued to all airplane operators who conduct any flight operations under instrument flight rules (IFR). FAA Order 8260.31, Foreign Terminal Instrument Procedures, current edition, provides direction and guidance on acceptance of foreign Terminal Instrument Procedures (TERPS). Additional information concerning TERPS is in Volume 4, Chapter 2, Section 3. For helicopter authorization, see OpSpec H101.

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OPSPEC/MSPEC/LOA C052—STRAIGHT-IN NONPRECISION, APV, AND CATEGORY I PRECISION APPROACH AND LANDING MINIMA—ALL AIRPORTS.

A. Applicability. OpSpec/MSpec/LOA C052 is applicable to all operators conducting airplane operations under 14 CFR parts 91, 91 subpart K (part 91K), 121, 125 (including the Letter of Deviation Authority (LODA) 125 operators), and 135. C052 specifies the types of instrument approaches the operator is authorized to conduct under instrument flight rules (IFR) and prohibits the use of other types of instrument approaches, and authorizes the lowest straight-in, nonprecision approach procedures with vertical guidance (APV), and Category (CAT) I Approach precision approach and landing minima. OpSpec/MSpec/LOA C052 is applicable to operators as follows:

1) OpSpec C052 is:

- Required to be issued to operators conducting operations under part 121 or 125;
- Required to be issued to operators using turbojets in operations under part 135; and
- Optional for operators conducting operations under part 135 with all other aircraft.

2) LOA C052 is required for operators conducting operations under part 125 that are issued a deviation from the certificate and OpSpec requirements of part 125 (125M).

3) MSpec C052 is required to be issued to those program managers conducting operations under part 91K.

4) For helicopter authorization, see OpSpecs H101, H103, and H117.

5) An optional LOA template is provided to satisfy a request from foreign regulatory authorities for evidence of training and approval to fly Global Navigation Satellite System (GNSS)-based approaches. Unlike the other C052 templates, the inspector only has the option of GNSS Landing System (GLS) or area navigation (RNAV) (GNSS) approaches to lateral navigation (LNAV), LNAV/vertical navigation (VNAV), Localizer Performance with Vertical Guidance (LPV), or Localizer Performance (LP) lines of minima. As a result, this LOA is not a comprehensive list of authorized approaches for the operator, but only a subset to address foreign GNSS-based approaches. The inspector should ensure the applicant presents documentation of capability to perform these operations. Additionally, the inspector should verify evidence of training. After completing these actions, the inspector may select the appropriate lines of minima in Table 1 of the LOA. The inspector may find these resources helpful: information detailed in this section and the current edition of Advisory Circular (AC) 90-107, Guidance for Localizer Performance with Vertical Guidance and Localizer Performance without Vertical Guidance Approach Operations in the U.S. National Airspace System, paragraphs 7, 8, and 9, to determine GNSS-based approach eligibility. Finally, the inspector may also reference Aeronautical Information Manual (AIM) paragraphs 1-1-18 and 1-1-19, and FAA's Performance-Based Flight Systems Branch Web page, for more details.

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NOTE: Technical questions regarding the approaches authorized by C052 should be directed to the Flight Technologies and Procedures Division (AFS-400) at 202-267-8790. Questions regarding the issuance of C052, including operational and training requirements, should be directed to the Air Transportation Division (AFS-200) at 202-267-8166, or General Aviation and Commercial Division (AFS-800) at 202-267-1100.

B. Types of Instrument Approaches Authorized. In OpSpec/MSpec/LOA C052, Table 1 specifies the types of instrument approaches the operator is authorized to conduct under IFR and prohibits the use of other types of instrument approaches. In the Web-based Operations Safety System (WebOPSS), the principal operations inspector (POI) will select the approaches that apply to the operator. Reference the AIM for a detailed description of each approach.

1) Before authorizing a type of instrument approach procedure (IAP), the POI, principal maintenance inspector (PMI), and principal avionics inspector (PAI) must ensure that the operator has revised the training and operations manuals, established that flightcrew training and checking requirements have been met, and that the equipment and systems are appropriate for the types of approaches to be authorized.

2) See Volume 4, Chapter 2, Section 1 for information on required training for various types of approaches.

3) All the approaches approved by OpSpec/MSpec/LOA C052 must be published in accordance with 14 CFR part 97 or the Foreign State Authority.

4) If the certificate holder/program manager/operator is authorized to conduct Global Positioning System (GPS) procedures as listed in Table 1 of OpSpec/MSpec/LOA C052, the aircraft and equipment must be listed in Table 1 of OpSpec/MSpec/LOA B034.

5) Required Navigation Performance (RNP) approaches.

a) RNAV (RNP) approaches are different from RNAV (GPS) approaches. Due to the equipment qualifications and the associated procedures and training for the lower minima of the RNAV (RNP) approaches, they are labeled as “special aircraft and aircrew authorization required (SAAAR).” C052 does not authorize RNP SAAAR operations. Authorization for RNAV (RNP) approaches is through nonstandard OpSpecs (300-series OpSpecs, which require FAA headquarters (HQ) approval), such as OpSpec C384. (Refer to the current edition of AC 90-101, Approval Guidance for RNP Procedures with AR.)

b) Foreign RNP-like procedures not designed to U.S. RNP SAAAR criteria are authorized with a nonstandard C358 authorization. This is a nonstandard OpSpec paragraph that requires FAA HQ approval.

6) Three groups of IAPs may be authorized in OpSpec/MSpec/LOA C052:

a) Column one specifies the Nonprecision Approaches (NPA) without vertical guidance that are authorized by OpSpec/MSpec/LOA C052. Operators must ensure the aircraft

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will not go below the minimum descent altitude (MDA) without the required visual references specified in part 91, § 91.175.

1. Operators authorized OpSpec/MSpec/LOA C073, Vertical Navigation (VNAV) Instrument Approach Procedures (IAP) Using Minimum Descent Altitude (MDA) as a Decision Altitude (DA)/Decision Height (DH), in conjunction with C052 may momentarily descend below the MDA when executing a missed approach.

2. The International Civil Aviation Organization (ICAO) term for an airport surveillance radar (ASR) approach is surveillance radar approach (SRA). Belgium labels these approaches as "SRE." Select "ASR/SRA/SRE" in column one to authorize these approaches.

b) Column two of OpSpec/MSpec/LOA C052 provides for the authorization of APV. These approaches provide vertical guidance, but do not meet the same standards as precision approach systems (e.g., instrument landing system (ILS) and Ground Based Augmentation System (GBAS) Landing System (GLS)). These APVs are trained using an approved method that allows descent to a published decision altitude (DA).

1. APV approaches may contain LPV minima requiring wide area augmentation system (WAAS) and LNAV/VNAV minima that may be flown with either barometric vertical navigation (baro-VNAV) or WAAS-based VNAV. These are authorized in column two of Table 1 of OpSpec/MSpec/LOA C052. See subparagraph C to determine applicable lines of minima. The AIM and the approach chart legend also have this information.

2. Aircraft accomplishing RNP approaches (RNAV (GPS) or RNAV (GNSS) are required to monitor lateral and, if approved for operational credit, vertical guidance deviations. For baro-VNAV approach operations on an RNP approach using the LNAV/VNAV minima, the current vertical deviation limits are +100/-50 feet. Aircraft qualified using the current edition of AC 20-138, Airworthiness Approval of Positioning and Navigation Systems, deviation display requirements for navigation, may use a vertical deviation limit of ±75 feet (or a smaller value). This information must be published in the Airplane Flight Manual (AFM), a Supplemental Type Certificate (STC), or verified by the Aircraft Evaluation Group (AEG).

3. To authorize RNAV APVs, select "RNAV (GPS)" (for part 97 approaches) or "RNAV (GNSS)" (for foreign approaches) from the selectable menu for column two of Table 1 of the OpSpec/MSpec/LOA C052 template.

c) Column three of OpSpec/MSpec/LOA C052 provides for the authorization of CAT I precision IAPs from an electronic glideslope (ILS or GLS).

1. "RNAV/ILS" in column three may only be selected in C052, if the operator meets the requirements in OpSpec/MSpec/LOA C063. For example, the United Arab Emirates publishes approach plates for Dubai titled, "RNAV ILS" or "ILS RNAV." The RNAV portion of the approach constitutes an RNAV Standard Terminal Arrival Route (STAR).

2. For pilot qualifications, the initial qualification segment of the certificate holder's approved ILS precision runway monitor (PRM) training program must be successfully completed prior to conducting ILS PRM approach and landing operations. Initial training

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materials must include published ILS PRM approach chart materials, the AIM, related Notices to Airmen (NOTAM), and the latest available FAA-produced and -approved ILS PRM video titled "ILS PRM Approach for Air Carriers" that each pilot must view, and which appears on the FAA Web site at http://www.faa.gov/training_testing/training/prm/. Pilots trained in PRM operations under previous guidance are not required to retrain using the new version of the video. However, pilots are required to know the change in operations of Traffic Alert and Collision Avoidance System (TCAS) during PRM operations, as well as the required actions in response to a controller instruction. Testing of knowledge objectives is required as part of initial and recurrent qualification training. See subparagraph K.

Figure 3-66E. Sample OpSpec/MSpec/LOA C052 Table 1

Table 1 - Authorized Instrument Approach Procedures

Nonprecision Approaches Without Vertical Guidance	Approaches With Vertical Guidance (APV)	Precision Approach Procedures (ILS & GLS)
ASR/SRA/SRE	LDA w/glideslope	ILS
AZI	RNAV (GPS)	ILS/PRM
AZI/DME	RNAV (GNSS)	PAR
AZI/DME Back Course	LDA PRM	ILS/DME
GPS	LDA PRM DME	RNAV/ILS
LDA	SDF w/glideslope	GLS
LDA/DME	LOC BC w/glideslope	
LOC	RNAV (GPS) PRM	
LOC BC		
LOC/DME		
NDB		
NDB/DME		
RNAV (GPS)		
VOR/DME RNAV		
SDF		
TACAN		
VOR		
VOR/DME		
LOC/BC/DME		

C. GPS Authorization. Volume 4, Chapter 1, Section 2 provides more extensive guidance on GPS and GPS WAAS equipment. The applicant must show that it has the ability to safely conduct GPS operations.

1) Background. GPS approach procedures have evolved from overlays of existing conventional approaches to standalone GPS approaches. (Overlay approaches are predicated upon the design criteria of the ground-based Navigational Aid (NAVAID) used as the basis of the approach and do not adhere to the design criteria for standalone GPS approaches.) Due to this transition, the FAA has revised the titles of the approach procedures to reflect these upgrades. The titles of all remaining GPS overlay procedures have been revised on the approach charts to read "…or GPS" (e.g., very high frequency omni-directional range (VOR) or GPS RWY 24). Therefore, all the approaches that can be used by GPS now contain "GPS" in the title (e.g., "VOR or GPS RWY 24," "GPS RWY 24," or "RNAV (GPS) RWY 24"). During these GPS

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approaches, underlying ground-based NAVAIDs are not required to be operational and associated aircraft avionics need not be installed, operational, turned on, or monitored (although monitoring of the underlying approach is suggested when equipment is available and operational). Existing overlay approaches may be requested using the GPS title. For example, request "GPS RWY 24" to fly the VOR or GPS RWY 24 approach.

NOTE: VOR/distance measuring equipment (DME) RNAV approaches will continue to be identified as VOR/DME RNAV RWY (Number) (e.g., VOR/DME RNAV RWY 24). VOR/DME RNAV, procedures which can be flown by GPS will be annotated with "or GPS" (e.g., VOR/DME RNAV or GPS RWY 24).

2) WAAS. As the satellite navigation evolution continues, WAAS has been developed to improve the accuracy, integrity and availability of GPS signals. WAAS receivers support all basic GPS approach functions and will provide additional capabilities. One of the major improvements provided by WAAS is the ability to generate an electronic glidepath, independent of ground equipment or barometric aiding. There are differences in the capabilities of the WAAS receivers. Some approach-certified receivers will only support a glidepath with performance similar to baro-VNAV, and are authorized to fly the LNAV/VNAV line of minima on the RNAV (GPS) approach charts. Receivers with additional capabilities, such as update rate and integrity limits are authorized to fly the LPV or LP line of minima. WAAS approach procedures may provide LPV, LNAV/VNAV, LP, and LNAV minima, and are charted as RNAV (GPS) RWY (Number) (e.g., RNAV (GPS) RWY 24). For further guidance, please see the AIM or contact AFS-400 at FAA HQ.

NOTE: Some WAAS installations do not support approaches at all, while some do not support LPV or LP lines of minima.

3) Local Area Augmentation System (LAAS). An additional augmentation system, LAAS has been developed to provide precision approaches similar to ILS at airfields. These precise approaches are based on GPS signals augmented by ground equipment. The international term for LAAS is GBAS and the approaches that use the equipment are referred to as GLS or GNSS Landing System approaches. LAAS equipment consists of a GBAS Ground Facility (GGF) supported by a minimum of four accurately surveyed reference stations and an uplink antenna called the very high frequency (VHF) Data Broadcast (VDB) antenna, as well as an aircraft LAAS receiver. The GGF can support multiple runway ends or landing areas served by procedures that are within the service coverage.

a) Similar to LPV and ILS approaches, GLS provides lateral and vertical guidance. By design, LAAS was developed as an "ILS look-alike" system from the pilot perspective. Unlike WAAS, LAAS may support approaches to CAT III Approach minima in the future due to its nearly identical performance standards to ILS in terms of accuracy, integrity, availability, and continuity. Portions of the GLS approach prior to and after the Final Approach Segment (FAS) may be based on RNAV or RNP segments. Therefore, a switch transition between RNAV or RNP and GLS modes may be required. In the future, the GGF may be able to support portions of the procedure outside the FAS.

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b) There are also a few differences from LPV, GLS, and ILS approaches in terms of charting, procedure selection, and identification. The LAAS procedure is titled "GLS Rwy XX" on the approach chart. In the aircraft, pilots will select a five-digit GBAS channel number or associated approach within the flight management system (FMS) menu. Selection of the GBAS channel number by pilot or FMS also tunes the VDB. The VDB provides information to the airborne receiver where the guidance is synthesized. The LAAS procedure is identified by a four alpha-numeric character field referred to as the Reference Path Indicator (RPI) or approach ID. This identifier is analogous with the IDENT feature of the ILS. The RPI is charted. Following procedure selection, confirmation that the correct LAAS procedure is loaded can be accomplished by cross-checking the charted RPI with the cockpit displayed RPI or audio identification of the RPI with Morse code (for some systems). Once selected and identified, the pilot will fly the GLS approach using the same techniques as an ILS.

c) Additional training may be required to authorized GLS approach and landing operations for commercial operators. If the operator is authorized to fly GLS approaches, flightcrews must be able to tune, identify, and conduct all stages of a GLS approach, including different types of missed approaches. However, some or all of these requirements may be demonstrated when conducting other operations, and may require little or no additional training. For example, an RNAV Missed Approach Segment (MAS) on a GLS may be demonstrated on another required approach, and the actions required to tune and identify GLS may require nearly identical actions on the part of the crew, based on the type of avionics used. Inspector guidance will be updated as GLS policy and procedures continue to evolve. If you have any questions on GLS training issues, contact AFS-400 at 202-267-8806.

D. Crew Training and Qualification. Crew training and qualification for all authorized instrument approach operations should meet the requirements in:

- Volume 3, Chapter 19;
- AC 120-53, Guidance for Conducting and Use of Flight Standardization Board Evaluations (current edition);
- Title 14 CFR parts 61, 91, 121, 125, and 135; and
- Advanced Qualification Program (AQP) requirements, if applicable.

E. Authorized Criteria for Approved IAPs. For operations to all U.S. airports, operators are authorized to execute instrument approach operations on IAPs that have been published:

1) Under part 97.

2) Under criteria in the current edition of FAA Order 8260.3, United States Standard for Terminal Instrument Procedures (TERPS).

3) Under any other criteria authorized by AFS-400.

4) By the U.S. military agency operating the U.S. military airport.

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NOTE: All published Standard Instrument Approach Procedures (SIAP) in the United States meet this requirement.

F. Runway Visual Range (RVR). Touchdown zone (TDZ) RVR is controlling for all operations authorized in C052. All other RVR reports are advisory. A mid-field RVR report may substitute for an inoperative TDZ RVR report, except for Special Authorization (SA) CAT I operations as described in subparagraph J.

G. Continuous Descent Final Approach (CDFA) Technique. CDFA is a specific technique for flying the FAS of an IAP as a continuous descent, without level off, from an altitude at or above the final approach fix (FAF) altitude, typically to a point approximately 50 feet above the runway threshold or the point where the flare will begin. For approaches that do not use LNAV/VNAV, LPV, or an ILS/GLS glidepath, a CDFA technique is recommended. When electronic or a prestored computed vertical guidance is not used, Vertical Speed (VS) or Flight Path Angle (FPA) may be used to achieve a CDFA profile. Compared to the "step down" descent approach technique, where the aircraft descends step-by-step prior to the next minimum altitude, a CDFA technique has safety and operational advantages, such as standardization of procedures, simplification of the decision process (one technique and one decision at one point), and use of a stable flightpath. However, precision approach obstacle penetration is not provided.

1) When using a CDFA technique, the decision point to determine if the flightcrew has the required visual references in sight to continue below the MDA may only be treated like a DA in reference to approach profiles and procedures. The operator must add an altitude increment to the MDA (e.g., 50 feet) to determine the altitude at which the missed approach must be initiated in order to prevent descent below the MDA or flight beyond the missed approach point (MAP).

2) The operator should ensure, prior to conducting CDFA, each flightcrew member intending to fly CDFA profiles undertakes training appropriate to the aircraft, equipment, and the different kinds of IAPs to be flown.

H. Reduced Precision CAT I Landing Minima. C052 specifies the equipment usage requirements and part 97 SIAP depiction required for reduced CAT I landing minima. Credit is given for flight director (FD), autopilot, and Head-Up Display (HUD) usage. The POI should allow the use of 1800 RVR minima to runways without centerline (CL) lighting or TDZ lighting, provided the SIAP contains a straight-in ILS minimum with the chart note, "RVR 1800 Authorized with use of FD or AP or HUD to DA." Additionally, the operator issued C052 is allowed to continue to use 1800 RVR line of minima on SIAPs without the above procedural note when the TDZ and/or CL lights are inoperative, if the approach is conducted in accordance with the equipment requirements outlined in C052. This is also reflected in the published inoperative components table for IAPs.

1) FAA Approval. Operators may continue to use the standard CAT I minima based solely on ground lighting systems without alteration of current authorizations or procedures. Operators can utilize reduced CAT I landing minima, provided the SIAP contains a straight-in ILS minimum with the chart note, "RVR 1800 Authorized with use of FD or AP or HUD to DA."

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2) Conditions of Approval. Before issuing the C052 authorization to use reduced CAT I minima based on aircraft equipment and operation, inspectors shall ensure that each operator meets the following conditions:

a) Aircraft and Associated Aircraft Systems. The authorized aircraft must be equipped with an FD, autopilot, or HUD that provides guidance to DA. The FD, autopilot, or HUD must be used in approach mode (e.g., tracking the Localizer (LOC) and glideslope). Inspectors must establish that the FD, autopilot, or HUD are certified for use down to an altitude of 200 feet above ground level (AGL) or lower.

b) Flightcrew Procedures. The flightcrew must use the FD, autopilot, or HUD to DA or to the initiation of a missed approach, unless visual references with the runway environment are established, thus allowing safe continuation to a landing. If the FD, autopilot, or HUD malfunctions or becomes disconnected, the flightcrew must execute a missed approach unless the runway environment is in sight.

c) Flightcrew Qualification. Each member of the flightcrew must have demonstrated proficiency using the FD, autopilot, or HUD (as appropriate) on the most recent instrument proficiency check (IPC) required in part 61, §§ 61.57(e)(2) and 61.58; part 91, § 91.1069; part 121, § 121.441; part 125, § 125.291; and part 135, § 135.297 (as applicable), or in an approved AQP.

I. SA CAT I. OpSpec/MSpec/LOA C052 contains selectable text which authorizes SA CAT I ILS approaches to runways without TDZ or runway centerline (RCL) lights with a radar altimeter DH as low as 150 feet and a visibility minimum as low as RVR 1400 when using HUD to DH. The operator must meet all of the following requirements:

1) Aircraft Requirements. To be approved for SA CAT I, each airplane must be certified and maintained for CAT II Approach operations. Those airplanes and equipment must be listed in Table 2 of OpSpec C059. The authorized airplane(s) must be equipped with the HUD that is approved for CAT II or CAT III operations.

2) Training Requirements. The flightcrew must be current and qualified for CAT II operations. The flightcrew must demonstrate proficiency in ILS approaches and landings to this minimum or to a lower minimum using the HUD prior to commencing any SA CAT I operations. This requirement applies both to initial eligibility for SA CAT I, as well as recurrent training.

3) Operational Requirements.

a) The flightcrew must use the HUD to DH in a mode used for CAT II or CAT III operations. This mode provides greater lateral and vertical flightpath accuracy and more sensitive alarm limits.

b) The flightcrew must use the HUD to DH or to the initiation of a missed approach, unless adequate visual references with the runway environment are established that allow safe continuation to a landing. Should the HUD malfunction during the approach, the

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flightcrew must execute a missed approach unless visual reference to the runway environment has been established.

c) The crosswind component on the landing runway must be 15 knots or less, unless the AFM's crosswind limitations are more restrictive.

d) The part 97 SIAP must have a published SA CAT I minimum.

e) Unlike the other approaches authorized in C052, the mid RVR report may not be substituted for the TDZ RVR report when using SA CAT I minima.

f) Single-pilot operators are prohibited from using SA CAT I landing minima.

J. Instrument Approach Operations at Foreign Airports. C052 specifies the requirements for nonprecision, APV, and precision approach criteria at foreign airports.

1) The procedure must be constructed by the foreign state using criteria that is derived from (or based on) U.S. TERPS or ICAO Doc 8168, Procedures for Air Navigation Services, or it must be based on other criteria approved by AFS-400.

2) Visibility minima must be based on U.S. criteria, European Union (EU) or European Aviation Safety Agency (EASA) criteria, or the criteria in ICAO Doc 9365, Manual of All-Weather Operations.

3) The MDA/minimum descent height (MDH) or DA/H must be at least 200 feet height above touchdown (HAT) or height above threshold (HATh) unless otherwise authorized by an OpSpec/MSpec/LOA.

4) Sequenced flashing lights are not required when determining if the Approach Light System (ALS) is equivalent to U.S. standards.

5) This section also specifies the requirements for determining DA/MDA when an Obstacle Clearance Limit (OCL) or Obstacle Clearance Altitude (OCA) is specified.

K. PRM. The FAA began the Multiple Parallel Approach Program (MPAP) to research whether ILS approaches to parallel runways would improve capacity. The objective was to achieve improvements in airport arrival rates through the conduct of simultaneous, closely spaced parallel approaches. That objective is being met using PRM.

1) ILS PRM, Localizer-Type Directional Aid (LDA) PRM and RNAV (GPS) PRM Approaches with Vertical Guidance. Where parallel RCLs are less than 4,300 feet apart, but not less than 3,000 feet apart, simultaneous ILS PRM approaches may be conducted. Similarly, where parallel RCLs are less than 3,000 feet apart, but no less than 750 feet apart, simultaneous offset instrument approaches (SOIA) may be conducted using an ILS and an LDA approach with glideslope. Those approaches are labeled "ILS PRM" and "LDA PRM," respectively, on instrument approach charts. Air traffic control (ATC) provides one PRM monitor controller for each runway to provide intrusion protection for the no transgression zone (NTZ) located between the two final approach courses. Whenever the runway spacing

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(or in the case of SOIA, the approach course spacing) is less than 3,600 feet and at least 3,000 feet, NTZ monitoring is accomplished using a special PRM radar. Utilization of vertical guidance is required for all PRM approaches. RNAV (GPS) PRM approaches may be substituted for the ILS PRM and/or the LDA PRM approach. Pilots must have completed PRM training prior to conducting any PRM approach. An ILS PRM and its overlayed RNAV (GPS) PRM approach are procedurally equivalent. LDA PRM and its overlayed RNAV (GPS) PRM approach are procedurally equivalent. Pilots may request the RNAV (GPS) PRM approach in lieu of the ILS PRM or LDA PRM approach; however, they may only conduct the approach when specifically cleared to do so by ATC.

2) The Breakout Maneuver. Working with industry, the FAA conducted extensive analyses of simulation data and determined that the implementation of PRM and SOIA approach operations to closely spaced parallel runways requires additional crew training. The primary focus of this training is to raise each pilot's situational awareness in ILS PRM, LDA PRM, and RNAV (GPS) PRM operations. The breakout maneuver must be flown manually.

a) Traffic Alert. One important element of the additional training is the pilot's understanding of the difference between a normal missed approach initiated by a pilot, and a breakout initiated by a PRM final monitor controller. It must be clear to flightcrews that the words "Traffic Alert," when used by the final monitor controller, signal critical instructions that the pilot must act on promptly to preserve adequate separation from an airplane straying into the adjoining approach path.

b) ATC Breakout Maneuver Command to Turn and/or Descend, Climb, or Maintain Altitude. The flightcrew must immediately follow the final monitor controller's vertical (climb/descend/maintain altitude) and horizontal (turn) commands. If the flightcrew is operating the TCAS in the Traffic Advisory (TA)/Resolution Advisory (RA) mode and receives a TCAS RA at any time while following the final monitor controller's command, the flightcrew will simultaneously continue to turn to the controller's assigned heading and follow the vertical guidance provided by the TCAS RA.

c) Time-to-Turn Standard. Regardless of airplane type, tests and data analysis revealed that pilots normally passed through an angle of bank of at least 3 degrees while rolling into a breakout turn within 10 seconds of receiving a breakout command. (Bank angles of between 20 and 30 degrees were normally achieved during the breakout.) The operator must show that its pilots can readily meet this time-to-initiate-turn standard prior to the POI authorizing ILS/PRM or LDA/PRM approaches in OpSpec/MSpec/LOA C052. Flightcrews are required to manually fly the breakout maneuver unless otherwise approved by AFS-200 or AFS-800, as appropriate (AFS-200 and AFS-800 must have concurrence from AFS-400 to approve breakout in auto modes). The air carrier should demonstrate its ability to meet this standard by having representative pilots perform the breakout maneuver while the POI or the POI's designated representative observes. The demonstration should conform to procedures contained in the air carrier's approved operating manual for its flightcrews. The commercial operator should submit procedures to its POI for this authorization.

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NOTE: In a breakout, ATC will never command a descent below the applicable minimum vector altitude (MVA), thus assuring that no flight will be commanded to descend below 1,000 feet above the highest obstacle during a breakout.

3) ILS/PRM, LDA/PRM, RNAV (GPS) PRM and the Use of TCAS. TCAS may be operated in TA/RA mode while executing ILS PRM, LDA PRM or RNAV (GPS) PRM approaches. However, when conducting these operations, pilots must understand that the final monitor controller's instruction to turn is the primary means for ensuring safe separation from another airplane. Pilots must bear in mind that TCAS does not provide separation in the horizontal plane. TCAS accomplishes separation by commands solely in the vertical plane. Therefore, during final approach only the final monitor controller has the capability to command a turn for lateral separation. Flightcrews are expected to follow any ATC instruction to turn.

a) ATC Command to Turn with TCAS RA. In the unlikely event that a flightcrew should simultaneously receive a final monitor controller's command to turn and a TCAS RA, the flightcrew must follow both the final monitor controller's turn command and the TCAS RA's climb or descent command.

b) TCAS RA Alone. In the extremely unlikely event that an RA occurs without a concurrent breakout instruction from the final monitor controller, the pilot should follow the RA and advise the controller of the action taken as soon as possible. In this instance, it is likely that a breakout command would follow.

c) TCAS Not Required. An operative TCAS is not required to conduct ILS/PRM or LDA/PRM approaches.

4) Pilot Training. See Volume 4, Chapter 2, Section 5 for information on pilot training required prior to authorizing PRM approaches.

5) ILS PRM, LDA PRM, and RNAV (GPS) PRM Authorizations. Operators will be authorized ILS PRM, LDA PRM, and RNAV (GPS) PRM approaches in the OpSpec/MSpec/LOA C052 templates. A definition of RNAV (GPS) PRM has been added to the A002 template.

OPSPEC/LOA C054—SPECIAL LIMITATIONS AND PROVISIONS FOR INSTRUMENT APPROACH PROCEDURES AND IFR LANDING MINIMUMS.

A. General. C054 is issued to all operators conducting operations under 14 CFR part 121, 125, and 125 (LODA A125). It is also issued to operators who conduct turbine-powered airplane operations under 14 CFR part 135. It is not issued to part 135 operators who do not operate turbine-powered airplanes unless that operator also conducts operations under part 121. C054 specifies the Runway Visual Range (RVR) landing minimum equivalent to the published RVR landing minimum that must be used by high-minimum pilots (less than 100 hours in aircraft type).

B. PIC Qualifications. For part 121 and part 135 operations, C054 also specifies that before a pilot in command (PIC) of a turbojet can conduct an instrument approach with visibility conditions reported to be below ¾ statute mile or RVR 4000 (basic turbojet landing minimums),

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the pilot must be specifically qualified and authorized to use standard landing minimums. See Volume 4, Chapter 2 for information on the qualification and authorization requirements to use the standard landing minimums.

C. PIC Takeoff Guidance. Further, for part 121 and part 135 operations, after the PIC has been qualified to use lower landing minimums, and the destination visibility conditions are forecast to be less than ¾ statute mile or RVR 4000, the pilot of a turbojet airplane shall not take off unless:

1) The destination runway length has been determined prior to takeoff to be at least 115 percent of the runway field length required by the provisions of part 121, § 121.195(b) or part 135, § 135.385(b), as appropriate, and

2) Precision instrument (all weather) runway markings or runway centerline (RCL) lights must be operational on that runway.

3) Once airborne, additional consideration of landing field length by the flightcrew is not required for normal operations. If unforecasted adverse weather or failures occur, the crew and aircraft dispatchers should consider any adverse consequences that may result from a decision to make a landing. The runway length needed in these changed circumstances must be determined considering the runway in use, runway conditions, current weather, Aircraft Flight Manual (AFM) limitations, operational procedures, and aircraft equipment status at the time of landing.

OPSPEC/MSPEC C055—ALTERNATE AIRPORT IFR WEATHER MINIMUMS.

A. Applicability. OpSpec/MSpec/LOA C055 is an optional authorization available to all operators conducting airplane operations under 14 CFR parts 91 subpart K (part 91K), 121, 125 (including the Letter of Deviation Authority (LODA) 125 operators), and 135. C055 provides a table from which the operator, during the initial dispatch or flight release planning segment of a flight, derives alternate airport instrument flight rules (IFR) weather minimums in those cases that require an alternate airport.

NOTE: Direct questions regarding the issuance of C055 to the Air Transportation Division (AFS-200) at 202-267-8166, the Flight Technologies and Procedures Division (AFS-400) at 202-385-4625, or the General Aviation and Commercial Division (AFS-800) at 202-267-8212.

B. Airports With At Least One Operational Navigation Facility. The first part of the table is for airports with at least one operational navigation facility providing a straight-in Nonprecision Approach (NPA) procedure, a Category (CAT) I precision approach, or, when applicable, a circling maneuver from an instrument approach procedure (IAP). Operators obtain the required ceiling and visibility by adding 400 feet to the minimum descent altitude/height (MDA/H) or, when applicable, the authorized decision altitude/height (DA/H) and by adding 1 statute mile or 1,600 meters to the authorized landing minimum. Additives are applied only to the height value to determine the required ceiling.

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C. Airports With at Least Two Operational Navigation Facilities. The second part of the table is for airports with at least two operational navigation facilities, each providing a straight-in NPA procedure or a straight-in CAT I precision approach procedure to different suitable runways. Operators obtain the required ceiling and visibility by adding 200 feet to the higher MDA/H or DA/H of the two approaches used and by adding one-half statute mile or 800 meters of visibility to the higher authorized landing minimum of the two approaches used. Additives are applied only to the height value to determine the required ceiling.

D. Higher Alternate Minimums When Using Two Operational Navigation Facilities. In some cases, it is possible to have higher alternate minimums when using two operational navigation facilities than when using one.

1) For example, an airport with one straight-in NPA procedure with an MDA/H of 400 feet and 1 statute mile visibility would have alternate minimums of 800 feet and 2 statute mile visibility (400 feet + 400 feet and 1 statute mile + 1 statute mile).

2) On the other hand, an airport with two straight-in approaches, one a straight-in precision approach with a DA/H of 200 feet and one-half statute mile visibility, and the other a straight-in NPA with an MDA/H of 700 feet and 1 statute mile visibility would have alternate minimums of 900 feet and 1 1/2 statute mile visibility (200 feet + 700 feet and one-half statute mile + 1 statute mile).

3) Since the OpSpecs require that operators use the higher ceiling and visibility, the minimums for the airport with two straight-in approaches are higher than for the airport with only one straight-in approach. When this situation exists, the operator may elect to consider the airport as having only one straight-in approach procedure and may add the higher buffer requirement (400 feet and 1 statute mile) to whichever straight-in approach procedure provides for the lowest possible ceiling and visibility minimums.

E. Using Two Different Runways. Two different runways may be the different ends of the same physical runway surface (for example, runway 4 and runway 22 are two different runways). When determining the suitability of a runway, wind, including gust, must be forecast to be within operating limits, including reduced visibility limits, and should be within the manufacturer's maximum demonstrated crosswind. All conditional forecast elements below the lowest applicable operating minima must be taken into account. The operator should also take into account any other potential runway limitations, such as Notices to Airmen (NOTAM), which may affect the landing at the estimated time of arrival (ETA).

F. Credit for Alternate Minimums. OpSpec/MSpec C055 (see revision history in the automated Operations Safety System (OPSS) guidance subsystem) now allows credit for alternate minimums based on engine inoperative CAT II or CAT III capability. This change is in the third row of the Alternate Airport Table. Flightcrews having that capability may take credit for engine inoperative CAT II/III qualified aircraft and adjust minimums accordingly. The alternate minimums are based on CAT III engine inoperative requirements. The following are some, but not all, of those requirements. See criteria in the current edition of AC 120-28, Criteria for Approval of Category III Weather Minima for Takeoff, Landing, and Rollout, for further engine inoperative requirements.

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1) Aircraft receives approval for engine inoperative CAT III.

2) Operators establish appropriate procedures.

3) The flightcrew receives performance and obstruction clearance information.

4) The flightcrew receives appropriate aircraft configuration information, wind limits, and other appropriate information.

G. Use of Area Navigation (RNAV) Global Positioning System (GPS) Minima at a Destination Alternate. Pilots may plan to use any instrument approach authorized for use with wide area augmentation system (WAAS) avionics at a required alternate if the aircraft has GPS WAAS equipment certified in accordance with Technical Standard Order (TSO) C145a, Airborne Navigation Sensors Using The Global Positioning System (GPS) Augmented By The Wide Area Augmentation System (WAAS), TSO/C146a, Stand-Alone Airborne Navigation Equipment Using The Global Positioning System (GPS) Augmented By The Wide Area Augmentation System (WAAS), or a later revision that meets or exceeds the accuracy of this TSO/revision, as approved by the Administrator. When using WAAS at an alternate airport, flight planning must be based on flying the RNAV (GPS) lateral navigation (LNAV) minimums line, minimums on a GPS approach procedure, or a conventional approach procedure with "or GPS" in the title. Also, RNAV (GPS)—or RNAV Global Navigation Satellite System (GNSS)—is based on a single navigational facility when determining the approach facility configuration in Table 1, even if there are two or more RNAV (GPS) approaches to different suitable runways. Upon arrival at an alternate, when the WAAS navigation system indicates that LNAV/vertical navigation (VNAV) or localizer performance with vertical guidance (LPV) service is available, operators may use vertical guidance to complete the approach using the displayed level of service. The FAA is removing the *NA* (alternate minimums not authorized) symbol from select RNAV (GPS) and GPS approach procedures so that operators with approach-approved WAAS receivers may use them at alternate airports. Some approach procedures will still require the *NA* symbol for other reasons (e.g., no weather reporting); therefore, the FAA cannot remove it from all procedures. Because every procedure must receive individual evaluations, removal of *NA* from RNAV (GPS) and GPS procedures will take some time.

H. Definition of "Two Operational Facilities." Question: "Does the FAA consider an ILS facility that contains a single transmitter frequency for an ILS, but with two different ILS identifications (depending on which runway is used), as one or two navigational facilities?"

1) The words "two operational facilities" mean that in the event there is a single failure of one facility, the other would be operational. In the situation where both instrument landing system (ILS) facilities share a single transmitter, they are "one operational navigational facility" because both ILSs would become inoperative in the event of a single transmitter failure.

2) The two ILS identifiers would have to be different even though the ILS transmitter frequency is the same for both. The instrument approach charts indicate to the pilot whether there is one frequency or two. Thus, one or two navigational facilities.

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I. Selectable Text and Tables. There are two selectable rows that can be loaded into Table 1 and the two paragraphs of selectable text in C055:

1) The two selectable rows in Table 1 authorize lower alternate minimums when planning to use either a CAT II or CAT III approach at the alternate airport. If a CAT II or CAT III credit is authorized, the first selectable text paragraph must be loaded as well.

2) The first selectable text paragraph states requirements for CAT II and CAT III credit applicable to alternate airport flight planning, and must be loaded if the operator has the CAT II or CAT III credit authorization described in subparagraph I1).

3) The second selectable text paragraph authorizes operators equipped with WAAS to use GPS approaches when determining an alternate, and lists the restrictions associated with using GPS approaches in alternate planning.

4) There are three selectable text options:

a) "1(a). Load this text if the operator is authorized CAT II or III alternate mins; OR"

b) "1(b). Load this text if the operator is authorized GPS/WAAS alternate mins; OR"

c) "1(c). Load this text if the operator is authorized CAT II or III AND GPS/WAAS alternate mins."

J. Helicopter Authorizations. For helicopter authorizations, see OpSpec/MSpec H105.

OPSPEC C056—IFR TAKEOFF MINIMUMS, PART 121 OPERATIONS—ALL AIRPORTS. C056 is issued to all operators who conduct operations under 14 CFR part 121.

A. General. C056 did not change in policy but was split into two paragraphs for programming purposes in the new automated Operations Safety System (OPSS): C056 and C078/C079.

B. Using Lower-Than-Standard Takeoff Minimums. If an operator is not authorized to use lower-than-standard takeoff minimums, C078 will not be issued. See Volume 4, Chapter 2 for information concerning requirements an operator must meet before being authorized to use lower–than-standard takeoff minimums. If an operator conducts operations under both 14 CFR parts 121 and 135, C056 and C057 may need to be issued. For more information, see the following:

- Part 121, §§ 121.649 and 121.651(a)(1).
- Title 14 CFR part 91, § 91.175(f).
- Volume 4, Chapter 2.
- Flight Standardization Board (FSB) report for specific aircraft.

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C. Availability to Part 91 Subpart K (Part 91K) Program Managers. This is not available or applicable to part 91K program managers. See § 91.1039(e).

OPSPEC C057—IFR TAKEOFF MINIMUMS, PART 135 OPERATIONS—ALL AIRPORTS. C057 is issued to all 14 CFR part 135 operators who conduct instrument flight rules (IFR) airplane operations to authorize an operator to use takeoff minimums equal to the lowest straight-in landing minimums (part 135, § 135.225(h)).

A. Issuance for Conducting IFR Standard Takeoff Minimums. C057 is issued for conducting IFR standard takeoff minimums, which are defined as 1 statute mile visibility or Runway Visual Range (RVR) 5,000 for airplanes having two engines or fewer, and one-half statute mile visibility or RVR 2,400 for airplanes having more than two engines. RVR reports, when available for a particular runway, must be used for all takeoff operations on that runway. All takeoff operations, based on RVR, must use RVR reports from the locations along the runway specified in this paragraph.

B. Single Engine IFR (SEIFR) Authorization. The principal operations inspector (POI), principal maintenance inspector (PMI), and principal avionics inspector (PAI) must coordinate the issuance of OpSpecs A046, C057, and D071 once the operator has met the requirements for SEIFR operations. All three OpSpec paragraphs must be issued for SEIFR authorization.

1) OpSpec A046 contains specific maintenance and operational limitations and provisions necessary for the authority to operate under IFR while carrying passengers in a single-engine airplane.

2) The standard OpSpec paragraph C079 is not authorized for SEIFR operations. SEIFR part 135 passenger-carrying operations are not authorized lower-than-standard takeoff minimums at any airport without concurrence and authorization from FAA headquarters (HQ). Thus, for SEIFR operations there is no automatic relief from the requirements of § 135.225(e).

3) OpSpec D071 contains requirements for airplanes operated in SEIFR operations.

C. Subparagraph Selectable for Issuance of C057. The following subparagraph is selectable for issuance in C057, if applicable:

> "c. When takeoff minimums are equal to or less than the applicable standard takeoff minimum, the certificate holder is authorized to use a takeoff minimum equal to the lowest authorized straight in CAT I IFR landing minimum applicable to the certificate holder for that particular airport. The Touchdown Zone RVR report, if available, is controlling."

D. Subparagraph Selectable for Issuance of C057 for Turbine-Powered, Single-Engine Airplanes. The following subparagraph is selectable for issuance in C057 for turbine-powered, single-engine airplanes only:

> "d. Notwithstanding the requirements of the "NOTE" in subparagraph b above, the certificate holder is authorized lower than standard takeoff minimums for its

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part 135 single engine passenger carrying operations in its turbine powered single engine airplanes only per the limitations and provisions of C057 including subparagraph c."

E. Authorizing Part 135 Operators to Use Takeoff Minimums Lower Than One-Half Mile or RVR 1,800. OpSpec C079 is applicable for authorizing the part 135 operator to use takeoff minimums lower than one-half mile or RVR 1,800. See the current edition of Advisory Circular (AC) 120-29, Criteria for Approval of Category I and Category II Weather Minima for Approach, for information concerning requirements an operator must meet before being authorized to use lower-than-standard takeoff minimums.

F. Other Applicability and Authorizations. C057 is not applicable or available for 14 CFR part 91 subpart K (part 91K) program managers. See part 91, § 91.1039(e). For helicopter authorizations, see OpSpecs H106 and H116.

OPSPEC C058—SPECIAL RESTRICTIONS FOR FOREIGN TERMINAL INSTRUMENT PROCEDURES.

A. General. C058 is issued only when the principal operations inspector (POI) (or region responsible for the geographic area where a foreign airport is located) finds it necessary to place special restrictions on a foreign terminal instrument procedure.

B. Purpose and Applicability of Restrictions. These special restrictions to foreign Terminal Instrument Procedures (TERPS) are applicable to U.S. air carriers (14 CFR parts 121 and 135) and program managers (14 CFR part 91 subpart K (part 91K)). The purpose of these special restrictions is to establish an equivalency between the foreign terminal instrument procedure and the International Civil Aviation Organization (ICAO) Procedures for Air Navigation Services Aircraft Operations (PANS-OPS) or TERPS criteria.

C. Other Guidance. FAA Order 8260.31, Foreign Terminal Instrument Procedures, current edition, provides direction and guidance on how to place restrictions on foreign instrument procedures. This order also contains a list of foreign TERPS that are currently restricted. If an operator conducts flights to any airport listed in the appendices of this order, the POI must issue C058 with the name of the airport, airport identification, procedure identification, and special restrictions listed.

D. Considerations and Procedures for Chek Lap Kok Airport. On July 6, 1998, Hong Kong's new airport (Chek Lap Kok) opened; at the same time, Hong Kong's old airport (Kai Tak) closed. Since there has been no revision to the appendices of Order 8260.31, we recommend removing the reference to Kai Tak airport from C058 and referencing the Chek Lap Kok airport. Consideration and procedures will be established for the following at the new Chek Lap Kok airport:

1) Loss of navigation capability;

2) Severe reduction of aircraft climb performance due to engine or aircraft system failures; and

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3) Escape paths for the above situations.

E. Helicopter Authorization. For helicopter authorization, see OpSpec/MSpec H107.

OPSPEC/MSPEC/LOA C059—CATEGORY II INSTRUMENT APPROACH AND LANDING OPERATIONS (OPTIONAL: 14 CFR PARTS 91, 121, 125, 125M, 135, AND 91K OPERATORS) AND SPECIAL AUTHORIZATION CATEGORY I INSTRUMENT APPROACH AND LANDING OPERATIONS (OPTIONAL: PART 91 OPERATORS).

NOTE: NextGen Tracking. Applications for approvals for this paragraph must be entered in the Regional NextGen Tracker as indicated in the General Procedures Section (Volume 3, Chapter 1, Section 1).

A. General. Category (CAT) II operations are approved by issuance of OpSpec C059 to certificate holders for 14 CFR parts 121, 125, and 135; MSpec C059 to program managers for 14 CFR part 91 subpart K (part 91K) fractional ownership operations; and LOA C059 to operators for parts 91 and 125M operations. Guidance for authorizing helicopter CAT II/CAT III operations can be found in Volume 4, Chapter 2, Sections 2 and 3.

B. Authorization for CAT II Airplane Operations. All initial CAT II authorizations for each operator/program manager and each airplane type used by that operator/program manager require regional Flight Standards division (RFSD) Next Generation Air Transportation System (NextGen) branch review and concurrence before issuing OpSpec/MSpec/LOA C059. RFSD concurrence is also required before amending OpSpec/MSpec/LOA C059 to include an airplane make, model, and series (M/M/S) new to the operator/program manager. CAT II operations are evaluated for authorization with reference to the following:

1) Advisory Circular (AC) 120-29, Criteria for Approval of Category I and Category II Weather Minima for Approach (current edition).

2) Approval of U.S. Operators for Special Authorization Category I and All Category II/III Operations—Parts 91 (Large Aircraft), 91K, 121, 125, and 135.

3) Approval of Small Category A Aircraft for Category II Operations—Part 91.

4) Volume 4, Chapter 2, Section 6, Category II Operations.

5) Applicable Lower Landing Minimums (LLM) maintenance program approved by the assigned avionics inspector in accordance with Volume 4, Chapter 2, Section 10.

C. Approved Airplanes. Each airplane type (M/M/S) used in CAT II operations must be listed in Table 1 of C059 and have an acceptable LLM maintenance program. The approach/landing system used, lowest decision height (DH), lowest touchdown zone (TDZ) Runway Visual Range (RVR) authorized for each airplane type, and any special equipment and other limitations must also be specified. The example in Table 3-17, Example of Category II Approach and Landing Minimums, illustrates the method for authorizing each airplane in OpSpec/MSpec/LOA C059.

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Table 3-17. Example of Category II Approach and Landing Minimums

Airplane M/M/S	Approach/Landing System	DH	TDZ RVR	Special Operational Equipment and Limitations
DC-9-31	Autopilot	100 ft	1,600	N/A
B 727-217	Autopilot	100 ft	1,600	
ERJ-190-100	Manual (HUD)	100 ft	1,200	Dual HUD A3 Mode All engines and autothrottle operating
CL-600-2D24	Autopilot	100 ft	1,200	AFM supplement 4 equipment operating
A-320-12	Autopilot	100 ft	1,200	N/A
DHC-8-402	Manual (HUD)	100 ft	1,000	N/A
B-737-200	Autoland	100 ft	1,000	
B-777-F	Autopilot	100 ft	1,000	Autoland required for RVR 1000 (300m)

NOTE: Refer to Table 1 of OpSpec C059.

D. CAT II Approach and Landing Systems. The equipment required to conduct either manually or automatically flown CAT II operations is specified in Table 1 of OpSpec/MSpec/LOA C059 (see sample in Table 3-17 above). The equipment required is established in accordance with the applicable regulations, the approved Aircraft Flight Manual (AFM) (if applicable), and AC 120-29. There are two acceptable methods of demonstrating that an airplane meets the technical qualifications and is eligible for CAT II operations. These acceptable methods are by approval under the type certificate (TC) or Supplemental Type Certificate (STC) holder, or an operation demonstration conducted by an operator/program manager. Type design approval is discussed in AC 120-29, paragraphs 5.19 through 5.19.3, and paragraph 10.5.

1) TC or STC Approval. The approved AFM (or Aircraft Flight Manual Supplement (AFMS)) identified in the airplane type design typically contains a statement that the airborne systems and equipment meet performance requirements, a statement regarding reliability and/or redundancy, and affirmation that such systems and equipment have been demonstrated to be eligible for CAT II operations. The AFM or AFMS also may specify that certain equipment is required for airworthiness approval of the various kinds of CAT II operations. Some AFMs or AFMSs also may indicate that acceptable CAT II performance was demonstrated, both with and without certain equipment (e.g., “autothrottles w/wo”). AC 120-29 also specifies that certain types of equipment are required for operations approval of the various kinds of CAT II operations (manual/autopilot). Therefore, the approved AFM or AFMS and AC 120-29 must be considered in determining if the additional equipment requirement meets the criteria. The equipment must be listed (specified) in Table 1 of OpSpec/MSpec/LOA C059. See Table 3-17.

a) Equipment that is explicitly required by the airplane certification regulations (14 CFR parts 23 and 25), the operating regulations (parts 91, 91K, 121, 125, and 135) and/or the approved AFM or AFMS *should not be listed* in Table 1 of the OpSpec/MSpec/LOA. The

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standard text of C059 requires that this equipment be installed and operational. The additional equipment or operational requirement that must be listed (specified) in OpSpec/MSpec/LOA C059 is determined by cross-checking the equipment required by regulations and the approved AFM or AFMS against the equipment required by AC 120-29 for the kinds of proposed CAT II operations.

b) Enter into Table 1 of OpSpec/MSpec/LOA C059 all additional equipment for the M/M/S and kind(s) of CAT II operations authorized. Include additional equipment required by any of the following (current editions):

- AC 120-29, Criteria for Approval of Category I and Category II Weather Minima for Approach,
- TC or STC, and
- FAA Order 8400.13, Procedures for the Evaluation and Approval of Facilities for Special Authorization Category I Operations and All Category II and III Operations.

c) If the AFM or AFMS describes acceptable performance both with and without certain items of equipment (that are not explicitly required by AC 120-29), it must be determined how the operator/program manager intends to conduct CAT II operations and train flightcrews with those items of equipment. If the operator/program manager proposes to conduct operations both with and without certain equipment (such as autothrottle, autopilot), flightcrews must be trained for both situations and the equipment does not need to be listed in Table 1 of OpSpec/MSpec/LOA C059.

2) Operational Demonstration of Equipment Eligibility. This method is used when equipment eligibility is not stated in the AFM, the AFMS, or the Flight Standardization Board (FSB) report. The operational demonstration method is only appropriate for airplanes and equipment that do not have CAT II reflected in the TC or STC. If the operational demonstration method is used:

a) Conduct the operational demonstration as described in AC 120-29. A part 121, 125, or 135 operator, or a part 91K program manager should request that its Flight Standards District Office (FSDO) provide assistance in the eligibility assessment.

b) The operator or program manager should provide the FSDO with the aircraft make, model, and serial number; any evidence of instrument flight rules (IFR) approach approval; and pertinent information from flightcrew operating procedures.

c) If the FSDO cannot determine equipment eligibility from the provided documentation (e.g., TC, STC, or AFM), it should forward the request and supporting data through its RFSD to the appropriate Aircraft Evaluation Group (AEG). The AEG will verify that the aircraft, its landing system, and equipment meet the criteria for CAT II operations, and that the system can safely fly the CAT II approach procedures. The AEG will provide written documentation (e.g., amended FSB report or other official documentation) to verify the eligibility of that equipment.

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d) The equipment determined by an operational demonstration to be eligible and required to conduct either manually or automatically flown CAT II operations should be listed in Table 1.

E. Specify the Approach/Landing System in Table 1 of OpSpec/MSpec C059. The kind of CAT II approach/landing system (manual head-up display (HUD), i.e., manual control using a HUD to touchdown; autopilot, i.e., approach coupler used to DH, followed by manual control landing; or autoland) must be specified for each airplane listed in Table 1 of OpSpec/MSpec/LOA C059. The principal operations inspector (POI) will select the appropriate phrase to place in the Approach/Landing System column: Manual (HUD), Autopilot, or Autoland.

F. Operational RVR Minimums. Table 2 in OpSpec/MSpec/LOA C059, shown as Table 3-18, Example of Category II Runway Visual Range Minimums, below, is a summary of the required RVR minimums for each type of CAT II operation.

1) Row 1 of Table 3-18 shows that for Standard CAT II operations at 1600 RVR, only the touchdown RVR report is required. During the 6-month Operator Use Suitability Demonstration, 1600 RVR is commonly authorized for new CAT II operators. Also, if the rollout RVR is out of service, CAT II approaches may still be flown to 1600 RVR. Note, the intention of this requirement is not that rollout and mid RVR reports may be ignored and CAT II approaches may still be flown to 1600 RVR. If these reports are available, minimum RVR values shown in the lower rows of Table 3-18 must be used (i.e., if mid or rollout RVR reports are available, they must be equal to or greater than the values shown in the lower rows of Table 3-18.).

2) Rows 2–4 of Table 3-18 show the TDZ RVR requirements for other, lower visibility CAT II operations. While TDZ RVR report requirements remain unchanged, mid and rollout RVR report requirements are new as of May 2013. Mid RVR equal to 600 and rollout RVR equal to 300 are the lowest values that may be reported to conduct Standard CAT II, CAT II to 1000 RVR (TDZ), or Special Authorization (SA) CAT II operations. All available RVR reports are now controlling, and a TDZ and rollout report are required in order to conduct CAT II operations below 1600 RVR. If the rollout report is not available, the mid or far-end report may be substituted. Midfield reports substituted for unavailable rollout reports must report 600 RVR or greater; far-end reports substituted for unavailable rollout reports must report 300 RVR or greater.

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Table 3-18. Example of Category II Runway Visual Range Minimums

CAT II RVR Minimums			
Type of Operation	**TDZ RVR**	**Mid RVR**	**Rollout RVR**
Standard CAT II	1600 (500 m)	NR	NR
Standard CAT II	1200 (350 m)	600 (175 m)#	300 (75 m)
CAT II to 1000 RVR	1000 (300 m)	600 (175 m)#	300 (75 m)
Special Authorization CAT II	1200 (350 m)	600 (175 m)#	300 (75 m)

NOTE: NR = Not Required; # = If available.

G. Runway Field Length Requirements.

1) For all CAT II operations, the required field length (determined prior to takeoff) is at least 1.15 times the field length required by:

- Part 91K, § 91.1037(b) and the AFM,
- Part 121, § 121.195(b),
- The AFM for parts 91 and 125, or
- Part 135, § 135.385(b).

2) Once airborne, additional consideration of CAT II landing field length by the flightcrew is not required for normal operations. If unforecasted adverse weather or failures occur, the crew and aircraft dispatchers should consider any adverse consequences that may result from a decision to make a CAT II landing. The runway length needed in these changed circumstances must be determined considering the runway in use, runway conditions, current weather, AFM limitations, operational procedures, and aircraft equipment status at the time of landing.

3) Runway field length requirements for parts 121 and 135 are no longer contained in OpSpec C059. **They have been moved to OpSpec C054, and any part 121 or 135 operators issued OpSpec C059 *must* also be issued OpSpec C054.**

H. Airplane Maintenance. For CAT II authorization, the operator or program manager must have an approved LLM maintenance program, as described in subparagraph B5). The maintenance program should detail a specific maintenance interval, periodic tests, and inspections required on systems and equipment used for LLM. The maintenance program should identify or contain system and equipment reliability tracking methods derived from 14 CFR part 119 requirements.

I. Flightcrew Qualifications. A pilot in command (PIC) who has not met the requirements of part 91, § 91.1039(c), part 121, § 121.652, part 125, § 125.379, or part 135, § 135.225(e), as appropriate, must use the high minimum pilot RVR landing minimum equivalents, as determined from the table in OpSpec/MSpec/LOA C054. For the PIC to conduct the part 121 CAT II operations at the lower authorized minimums, he or she must have currently accumulated the hours required by § 121.652 in the aircraft type that he or she will fly for that

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carrier. The provision of Air Transport Association of America (A4A) Exemption 5549 for part 121 air carriers may also apply.

J. Authorized CAT II Approach and Landing Minimums. To determine the applicable minimums for an approach, the pilot must first compare the DH shown on the 14 CFR part 97 approach chart with the operator's lowest authorized DH for the airplane being flown. The higher minimum is applicable. Therefore, considering RVR sensor reports available, the RVR to be used for the approach is the highest RVR value in the approach chart, Table 1, or subparagraph f of the OpSpec/MSpec part 125 LOA or subparagraph 6 of the part 91 LOA.

K. Authorized CAT II Approaches, Airports, and Runways.

1) CAT II Operations. If the airport and runways are approved for CAT II operations in part 97, they should not be routinely listed in OpSpec/MSpec/LOA C059 unless the POI determines there is a need to specify a special limitation for an operator at a particular airport.

a) Standard CAT II approaches are published as CAT II procedures in the National Aeronautical Navigation Services (AeroNav Services), Air Traffic Products and Publications Group, instrument approach procedure (IAP) Flight Information Publication (FLIP). They are identified by the procedure name "ILS RWY 16C (CAT II)" and by the note in the minimums section stating "CATEGORY II ILS—SPECIAL AIRCREW & AIRCRAFT CERTIFICATION REQUIRED."

b) Special Authorization (SA) CAT II (formerly called reduced-lighting CAT II) approaches are published by AeroNav Services with the identifier "(SA CAT II)," and they also have a note in the Procedure Notes section stating "Reduced Lighting: Requires specific OPSPEC, MSPEC, or LOA approval and use of Autoland or HUD to touchdown." Some SA CAT II approaches were published without the "(SA CAT II)" identifier, but will have the same or similar note.

2) Standard CAT II. The operator may be authorized for up to three different minimums for use with published part 97 approaches: 1600 RVR, 1200 RVR, and 1000 RVR. Allowable minimums depend on the availability of RVR sensors and availability and use of required airplane equipment.

a) Minimums of TDZ 1600 RVR and TDZ 1200 RVR require the flightcrew to use an approach coupler or to fly at least to DH under manual control using a HUD for flight guidance. A manually flown landing is assumed and need not be specified. Autoland or HUD-to-touchdown operations for Standard CAT II may be authorized if the operators are also authorized OpSpec/MSpec/LOA C061 or C062.

b) Minimums of 1000 RVR require the flightcrew to use autoland or to fly under manual control using a HUD to touchdown.

1. For operations to touchdown, the airplane and its automatic flight control guidance system (AFCGS), autoland system, or manually flown guidance system (HUD), are approved for approach and landing operations as specified by AC 120-29.

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2. For manual control using a HUD to touchdown, the HUD must be flown in the AIII Approach mode.

3. The flightcrew has been trained at the lower visibilities before they can be authorized. If the flightcrew is currently authorized CAT III operations, no further training is required for this authorization in C059.

c) CAT II operations, with a DH of 100 feet and 1000 RVR (300 meters), may be authorized at certain foreign airports. Table 3-19, Example List of Authorized Foreign Airports and Runways for Category II Instrument Approach and Landing Operations, illustrates an example for listing authorized foreign airports and runways.

Table 3-19. Example List of Authorized Foreign Airports and Runways for Category II Instrument Approach and Landing Operations

Airport Name/Identifier	Runways	Limitations and Provisions
Mirabel, Canada CYMX	06	NA
Taipei— Chiang Kai Shek, Taiwan RCTP	10, 28	NA
Tokyo Narita, Japan RJAA	16	NA
Athens, Greece Eleftherios Venizelos LGAV	03L 03R 21L 21R	RVR 350 m

Refer to Table 3 in OpSpec C059.

d) Operators authorized SA CAT II, as described in subparagraph K3) below, may also be authorized to conduct approaches to standard CAT II facilities when the TDZ and/or centerline (CL) lights are inoperative. They must comply with all requirements in paragraph K3), using minimums appropriate to the RVR available and using autoland or manual (HUD) to touchdown.

3) SA CAT II. In addition to the standard CAT II operations authorized by OpSpec/MSpec/LOA C059, SA CAT II operations can be authorized to qualifying runways that do not meet the performance or ground equipment requirements normally associated with a compliant CAT II operation (e.g., TDZ lighting, CL lighting, or Approach Lighting System with Sequenced Flashing Lights (ALSF) 1 and 2).

a) Approval criteria for SA CAT II approaches are given in FAA Order 8400.13. The instrument landing system (ILS) facilities used are CAT I ILS installations that meet the glideslope (GS) and localizer signal quality requirements of CAT II facilities. The required increase in aircraft capabilities of HUD or autoland to touchdown mitigates the reduced-lighting requirements.

b) RVR requirements and available minimums are the same as standard CAT II and in accordance with Table 3-18, but these minimums require the flightcrew to use autoland or to fly under manual control using a HUD to touchdown.

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c) Aircraft operation approval, HUD usage, and flightcrew training requirements are the same as for standard CAT II to 1000 RVR.

4) Lists. The lists "Foreign Facilities Approved for Category II/III Operations," "Restricted U.S. Facilities Approved for Category II/III Operations," and "U.S. Runways Approved for Special Authorization CAT II Operations" are located on the Flight Operations Branch (AFS-410) Web site at: http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs400/afs410/status_lists/.

NOTE: CAT II or III approaches in foreign states at airports that are controlled by the U.S. Department of Defense (DOD) and that meet FAA CAT II/III criteria do not need to be included on the approved foreign facilities list and do not need to be listed in Table 3 of OpSpec/MSpec/LOA C059.

L. Missed Approach Requirements. The missed approach decision point has been changed from 1,000 feet above touchdown to the final approach fix (FAF). After passing the FAF, if the required visual landing references are not acquired and any failure of required equipment occurs, or if the primary guidance system in use (autopilot/autoland or HUD) is disengaged or disabled for any reason, the flightcrew must execute the missed approach. The exception to this requirement is that if both guidance systems are properly briefed and engaged before reaching the FAF and one system is disengaged or fails inside the FAF, the remaining guidance system is considered the primary and the approach may be continued.

M. CAT II Runway Restrictions. The requirement to conduct automatic landings in reduced lighting and 1,000 RVR operations implies that autoland restrictions imposed by prethreshold terrain must be considered. Approaches that have prethreshold terrain characteristics that may cause abnormal performance in flight control systems will have a note on the approach chart requiring a special autoland evaluation. Approved runways will be on the AFS-410 restricted facilities list in subparagraph K4) above, and must be listed in Table 4 of OpSpec/MSpec/LOA C059.

N. SA CAT I for Part 91. The part 91 LOA contains selectable text that authorizes SA CAT I ILS approaches to runways without TDZ or runway centerline (RCL) lights with a radar altimeter (RA) DH as low as 150 feet and a visibility minimum as low as RVR 1400 when using a HUD to DH. This selectable text is only available in the part 91 LOA. SA CAT I authorization for operators under other 14 CFR parts is available in OpSpec/MSpec/LOA C052. The operator must meet *all* of the following requirements:

1) Aircraft Requirements. To be approved for SA CAT I, each airplane must be certified and maintained for CAT II operations. Those airplanes and equipment must be listed in Table 1 of OpSpec C059. The authorized airplane(s) must be equipped with a HUD that is approved for CAT II or CAT III operations.

2) Training Requirements. The flightcrew must be current and qualified for CAT II operations. The flightcrew must demonstrate proficiency in ILS approaches and landings to this minimum or to a lower minimum using the HUD prior to commencing any SA CAT I

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operations. This requirement applies both to initial eligibility for SA CAT I as well as recurrent training.

3) Operational Requirements.

a) The flightcrew must use the HUD to DH in a mode used for CAT II or CAT III operations. This mode provides greater lateral and vertical flightpath accuracy and more sensitive alarm limits.

b) The flightcrew must use the HUD to DH, or to the initiation of missed approach, unless adequate visual references with the runway environment are established that allow safe continuation to a landing. Should the HUD malfunction during the approach, the flightcrew must execute a missed approach unless visual reference to the runway environment has been established.

c) The crosswind component on the landing runway must be less than the AFM crosswind limitations, or 15 knots or less, whichever is more restrictive.

d) The part 97 Standard Instrument Approach Procedure (SIAP) must have a published SA CAT I minimum.

e) Unlike other CAT I approaches, the mid-RVR report may *not* be substituted for the TDZ RVR report when using SA CAT I minima.

f) Single-pilot operators are prohibited from using SA CAT I landing minima.

OPSPEC/MSPEC/LOA C060—CATEGORY (CAT) III INSTRUMENT APPROACH AND LANDING OPERATIONS.

NOTE: NextGen Tracking. Applications for approvals for this paragraph must be entered in the Regional NextGen Tracker as indicated in the General Procedures Section (Volume 3, Chapter 1, Section 1).

A. General. Category (CAT) III is an optional authorization. The following issuances are required for authorizing CAT III operations: OpSpec C060 for 14 CFR parts 121, 125, 121/135, and 135; MSpec C060 for 14 CFR part 91 subpart K (part 91K); and LOA C060 for parts 91 and 125M. For 14 CFR part 129 operations, see Volume 12, Chapter 2.

1) CAT III operations are evaluated in accordance with the current edition of Advisory Circular (AC) 120-28, Criteria for Approval of Category III Weather Minima for Takeoff, Landing, and Rollout.

2) The initial CAT III authorization must be coordinated through the regional Flight Standards division (RFSD) Next Generation (NextGen) branch (see Volume 4, Chapter 2).

3) RFSD NextGen branch concurrence is also required before amending OpSpec/MSpec/LOA C060 to include an additional airplane make, model, and series (M/M/S) for an operator.

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4) All reductions in CAT III operating minimums for each operator and aircraft also require RFSD NextGen Branch concurrence.

5) Initial CAT III authorizations may require the operator to use higher minimums for a period of time or number of operations. The principal operations inspector (POI) should issue an initial, interim authorization using the higher minimums, and reissue OpSpec/MSpec/LOA C060 authorizing lower minimums upon completion of the approval demonstration phases as shown in Volume 4, Chapter 2, Section 2, paragraph 4-194.

B. Applicability. The authorization is applicable to operations conducted by:

- Part 121 certificate holders,
- Part 125 certificate holders,
- Part 135 certificate holders,
- Part 121/135 certificate holders,
- Part 91K program managers,
- Part 91 operators, and
- Part 125M operators/companies.

C. Airplanes Approved for CAT III Operations. Airplanes with an approved Aircraft Flight Manual (AFM) entry authorizing CAT III may be approved for CAT III. In accordance with the AFM, CAT III operations may be conducted with either fail operational (FO) or fail passive (FP) systems. Table 3-20, Fail Operational Landing Systems, and Table 3-21, Fail Passive Landing Systems, classify all CAT III landing and rollout systems as either FP or FO and show the associated lowest Runway Visual Range (RVR) minimums. The type of landing and rollout system is specified (listed) in Table 1 (see Figure 3-67F, Example OpSpec/MSpec/LOA C060, Table 1) for each airplane M/M/S.

1) Each airplane type M/M/S and the equipment authorized to conduct CAT III operations must be listed in Table 1 (see Figure 3-67F). In order to select an operator's M/M/S in OpSpec/MSpec/LOA C060, Table 1, ensure that "CAT III" is selected under "Authorizations" on the "Edit Aircraft" page of "Operator Data." Aircraft (including wide-body aircraft such as the DC-10, L-1011, and B-747, which are authorized for FO CAT III, but which have not been demonstrated to meet the FP provisions of AC 120-28, Appendix 3) may be approved for FP operations with landing minimums of RVR 1000. (See AC 120-28 for further details.)

2) The equipment required to conduct CAT III operations is established in accordance with the applicable 14 CFR parts, the approved AFM, and AC 120-28.

a) The only acceptable method of demonstrating that an airplane is Airworthy for CAT III operations is through a type design approval obtained by a manufacturer.

b) The approved AFM (or Aircraft Flight Manual Supplement (AFMS)) for airplanes that have CAT III type design approval contains a statement to the effect that the airborne systems have demonstrated the reliability and redundancy necessary for CAT III operations in accordance with AC 120-28.

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c) The AFM also specifies that certain equipment is required for airworthiness approval of the various kinds of CAT III operations.

d) Some AFMs also indicate that acceptable CAT III performance was demonstrated both with and without ("w/wo") certain equipment (for example, "autothrottles w/wo"). AC 120-28 also specifies that certain types of equipment are required for operational approval of the various kinds of CAT III operations. Therefore, both the approved AFM and AC 120-28 must be considered in determining the additional equipment that must be listed in Table 1 (see Figure 3-67F).

3) Equipment that is explicitly required by the airplane certification regulations (14 CFR parts 23 and 25), the operating regulations (parts 91, 121, 125, and 135), and/or the approved AFM should not be listed in Table 1 (see Figure 3-67F).

a) Additional equipment that must be listed in Table 1 (see Figure 3-67F) is determined by cross-checking the types of equipment required by AC 120-28 for the kind(s) of CAT III operations proposed against the equipment required by the regulations and the approved AFM.

b) Also, the equipment required by the guidance and direction in the RFSD NextGen branch concurrence letter is listed in Table 1 (see Figure 3-67F) as additional equipment.

c) The standard text of OpSpec/MSpec/LOA C060 requires this equipment to be installed and operational.

4) When the AFM indicates acceptable performance, both with and without certain items of equipment (that are not explicitly required by AC 120-28 or the RFSD NextGen branch concurrence letter), it must be determined how the operator intends to conduct CAT III operations and train flightcrews with those items of equipment.

a) If the operator proposes to conduct operations both with and without certain equipment (such as autothrottle), the operator must train flightcrews for both situations, and the item of equipment does not need to be listed in OpSpec/MSpec/LOA C060.

b) If the operator proposes to conduct operations only when those items of equipment (with and without) are functional, then those items of equipment must be listed in OpSpec/MSpec/LOA C060.

5) The authorizations for a decision height (DH)/alert height (AH), the lowest RVR (see subparagraph I), and the FP/FO landing systems must be specific for each airplane type. In general, Tables 3-20 and 3-21 summarize RVR and other requirements for different landing and rollout systems.

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Table 3-20. Fail Operational Landing Systems

Fail Operational Landing Systems—General 1. Utilize an AH (typically 50 ft). 2. Must go-around if any system failure occurs above AH. 3. Could land safely if a failure occurs after AH.		
Fail Operational Without a Rollout System	**Fail Operational with a Fail Passive Rollout System**	**Fail Operational with a Fail Operational Rollout System**
1. No visual necessary. 2. Lowest allowable RVR 600/600/300.	1. No visual necessary. 2. Lowest allowable RVR 400/400/300.	1. No visual necessary. 2. Lowest allowable RVR 300/300/300.

Table 3-21. Fail Passive Landing Systems

Fail Passive Landing Systems—General 1. Utilize a DH (no less than 50 ft). 2. Must have visual references NLT DH to land, otherwise missed approach. 3. System not capable of autoland if a failure occurs after DH. 4. If visual references are lost after DH or a failure after DH (prior to touchdown), missed approach.	
Fail Passive Without a Rollout System	**Fail Passive with a Fail Passive or Fail Operational Rollout System**
Lowest allowable RVR 600/600/300.	Lowest allowable RVR 600/400/300.

D. Runway Field Length Requirements.

1) For all CAT III operations, the required field length (determined prior to takeoff) is at least 1.15 times the field length required by:

- Part 91K, § 91.1037(b) and the AFM,
- Part 121, § 121.195(b),
- The AFM for parts 91 and 125, or
- Part 135, § 135.385(b).

2) Once airborne, additional consideration of CAT III landing field length by the flightcrew is not required for normal operations. If unforecasted adverse weather or failures occur, the crew and aircraft dispatchers should consider any adverse consequences that may result from a decision to make a CAT III landing. The runway length needed in these changed circumstances must be determined considering the runway in use, runway conditions, current weather, AFM limitations, operational procedures, and aircraft equipment status at the time of landing.

3) Runway field length requirements for parts 121 and 135 are no longer contained in OpSpec C060. **They have been moved to OpSpec C054, and any part 121 or 135 operators issued OpSpec C060 *must* also be issued OpSpec C054.**

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4) The "Special Operational Equipment and Limitations" column in Table 1 (see Figure 3-67F) is provided for equipment that is *in addition* to that required by 14 CFR and not included in the AFM. For example, additional equipment may be required to meet the field length requirement where "procedural" means alone is not acceptable.

E. Operators Authorized for CAT IIIa (RVR 700) Operations Can be Approved for RVR 600. Some aircraft were certified in the AFM for CAT IIIa operations. These operations are limited by regulation to no lower than RVR 700. If the AFM or AFMS also contains a statement that the CAT III systems are FP or have been demonstrated to meet the airworthiness criteria of AC 120-28 for FP systems, the aircraft may be approved for operations no lower than RVR 600. Most CAT III operations authorized for RVR 700 prior to issuance of AC 120-28 are now eligible for authorization to RVR 600, upon request of the operator for issuance of a revision to that operator's pertinent OpSpecs. Operators authorized RVR 700 may be approved for RVR 600/600/300 or RVR 600/400/300 operations in accordance with Table 3-21 when:

1) The AFM or AFMS contains a statement that the aircraft systems are FP.

2) The operator has incorporated changes reflecting RVR 600 into the approved training program (when applicable), bulletins, aircraft placards, etc., as appropriate.

3) A check airman or an FAA inspector has certified the flightcrews to fly to these reduced minimums.

F. Approval for RVR 600. An operator currently using RVR 600 or lower in its approved training for FP operations may be approved for RVR 600 without further checking. Approval may be given when the operator has updated the approved training program (when applicable) and flightcrew bulletins to reflect the RVR 600 authorization.

G. CAT III Approach and Landing Minimums. Figure 3-67F is an example of Table 1 with data inserted. If an operator is not authorized to conduct those kinds of CAT III operations with a particular airplane, or if the operator does not need special operational equipment, put "NA" under the appropriate column (do not delete or leave any cells blank).

NOTE: Include only the equipment that is not explicitly required by the regulations and/or the AFM. For new CAT III operators, inspectors must coordinate the operational equipment requirements with the RFSD NextGen branch during normal review processing.

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Figure 3-67F. Example OpSpec/MSpec/LOA C060, Table 1

Airplane M/M/S	Landing System*	Rollout System*	DH/AH	TDZ/Mid/RO RVR	Special Operational Equipment and Limitations
B-737-232	FP	NA	50 DH	600/600/300	NA
B-737-35B	FP	NA	50 DH	600/600/300	Either autoland or HGS must be operable
B-737-832	FP	NA	50 DH	600/600/300	Either autoland or HGS must be operable.
A-320-214	FO	FO	100 AH	300/300/300	NA
B-737-400	FP	FP	50 DH	600/400/300	1. Two EADI displays (EFI switch in NORMAL). 2. First Officer Flight Director Display. 3. Operational antiskid. 4. Cockpit LWMP status placard indicating CAT IIIa HGS capable.
B-747-47UF	FO	FO	100 AH	300/300/300	Antiskid and thrust reverser system must be fully operative for operations below RVR 600.
DASAULT FALCON-900EX	FP	FP	50	600/600/300	NA
B-757-225	FO	FO	50AH	300/300/300	1.30 required if thrust reverser or antiskid inoperative below RVR 600.
B-727-277	FP	NA	DH 50	600/600/300	NA
B-757-236	FO	FO	50 AH	300/300/300	NA
B-767-222	FO	FO	100 AH	300/300/300	Use 1.3 if autobrake is inoperative.
A319-112	FO	FO	100 AH	300/300/300	1.30 required if thrust reverser or antiskid inoperative below RVR 600.
B-777-236	FO	FO	50AH	300/300/300	NA
DC-10-10F	FO	FO	100 AH	300/300/300	Ground speed indicating system.
MD-11F	FO	FO	100 AH	300/300/300	Ground speed indicating system.

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NOTE: Enter: "NA" for not applicable; "FP" for FP landing or rollout control system; and "FO" for FO landing or rollout control system (i.e., "FP/FO" systems include autoland and head-up display (HUD) guidance systems (also referred to as Head-Up-Guidance Systems (HGS))).

H. Additional Information. Some European Aviation Safety Agency (EASA) Member States apply a DH (as opposed to an AH) to operations at or below RVR 600 because of instrument landing system (ILS) facility integrity concerns.

I. Required RVR Reporting Equipment. The RVR reporting equipment authorizations were expanded to enable the use of new and more robust EASA approval and AC 120-28 certification criteria for autoflight or a guidance landing system(s) with FP rollout control or flight guidance landing systems. A summary of these authorizations is shown in Figure 3-67G, OpSpec/MSpec/LOA C060, Table 2.

1) OpSpec/MSpec/LOA C060 allows touchdown RVR 600; mid RVR 400; rollout RVR 300 (600/400/300) for appropriate FP landing and FP or FO rollout systems; and RVR 400/400/300 for FO landing systems with FP rollout control or flight guidance (HUD) landing systems.

2) Note that to use the touchdown RVR 600 with mid RVR 400 and rollout RVR 300, a published runway landing minimum of RVR 400 or lower is required—that is, mid RVR 400 and rollout RVR 300 cannot be used at runways where RVR 600 is the lowest published RVR minimum.

3) RVR 300/300/300 is allowed for FO landing systems with FO rollout control or flight guidance (HUD) landing systems.

4) The operator or program manager is not authorized to conduct operations using an RVR lower than the published minimums at any runway (domestic or foreign), even if the operator or program manager is authorized to conduct CAT III operations at a lower RVR than is published for that approach.

Figure 3-67G. OpSpec/MSpec/LOA C060, Table 2

Landing System	Rollout System	TDZ RVR	Mid RVR	Rollout RVR
FP or FO	None	600 (175 m)	600 (175 m)	300 (75 m)
FP	FP or FO	600 (175 m)	400 (125 m)	300 (75 m)
FO	FP	400 (125 m)	400 (125 m)	300 (75 m)
FO	FO	300 (75 m)	300 (75 m)	300 (75 m)

J. Crosswind Limitations. The crosswind component on the landing runway must be 15 knots or less, unless the AFM's crosswind limitations are more restrictive. This should be reflected in the approved training program and flightcrew bulletins.

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K. Authorized CAT III Airports and Runways. With the issuance of OpSpec/MSpec/LOA C060, the operator/program manager is authorized to conduct CAT III operations at all domestic airports and runways using an approved 14 CFR part 97 CAT III instrument approach procedure (IAP), unless the runway is on the Flight Technologies and Procedures Division's (AFS-400) Restricted U.S. Facilities Approved for Special Authorization Category II & Category III Operations list (http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs400/afs410/status_lists), or unless a restrictive Notice to Airmen (NOTAM) is issued for that approach. Domestic airports and runways that have no restrictions do not have to be individually listed in OpSpec/MSpec/LOA C060. All foreign airports and runways approved for CAT III operations and restricted U.S. airports and runways approved for CAT III operations must be specifically identified and listed in OpSpec/MSpec/LOA C060, Tables 3 and 4, respectively. The list of approved foreign CAT III airports and runways can be found at http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs400/afs410/status_lists.

1) Foreign Airports and Runways. CAT III operations may be authorized at the foreign airports and runways listed in Table 3 (see Figure 3-67H, Example OpSpec/MSpec/LOA C060, Table 3) from the selection list provided for in Table 3.

2) U.S. Facilities with Restrictions or Conditions. The U.S. ILS facilities provided in Table 4 (see Figure 3-67I, Example OpSpec/MSpec/LOA C060, Table 4) are approved for CAT III operations only for the specific aircraft listed. The characteristics of the prethreshold terrain, runway touchdown zone (TDZ) slope, or steep glideslope (GS) at these facilities may cause abnormal performance in flight control systems. Additional analysis and/or flight demonstrations are typically required for each aircraft type before approval of CAT III minimums at each runway. Publication of a part 97 Standard Instrument Approach Procedure (SIAP) or additional operators and their aircraft may be approved by the regional NextGen branch as provided in AC 120-28, Appendix 8. Approved aircraft are equipped with either autoland or HUD flight guidance equipment. The restrictions at U.S. facilities for the certificate holder are provided as selectables for listing in Table 4.

Figure 3-67H. Example OpSpec/MSpec/LOA C060, Table 3

Foreign Airports and Runways Approved for CAT III Operations	
Airport Name/Identifier & Runway(s)	**Special Limitations**
London/Gatwick, England; EGKK; 8R/26L	None
Luxembourg, Luxembourg; ELLX; 24	None
Madrid/Barajas, Spain; LEMD; 18L/18R/33L/33R	None
Almaty, Kazakhstan; UAAA; 23R	None

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Figure 3-67I. Example OpSpec/MSpec/LOA C060, Table 4

Runway and Aircraft Restrictions and Limiting Conditions for Part 97 CAT III Operations	
Airport Name/Identifier, Runway(s) & CAT III Minimums	**Restrictions & Limitations**
Pittsburgh/Greater Pittsburgh Intl, PA; KPIT RY10L; RVR 300	Aircraft approved: A319, A320, B-757, and B-767
Pittsburgh/Greater Pittsburgh Intl, PA; KPIT RY10R; RVR 600 and RVR 300	Restricted to 600 RVR until less-than 600 RVR SMGCS operations are approved. Aircraft approved RVR 600: B-757 and B-767. Aircraft approved RVR 300: A319 and A320.

L. Inoperative Lights. If CAT III operations are planned at a runway, but TDZ and/or centerline (CL) lights are inoperative, CAT II operations may be conducted if weather permits and the operator has the authorization described below in OpSpec/MSpec/LOA C059. OpSpec/MSpec/LOA C059 authorizes specific CAT II minimums for part 97 CAT II approaches when the TDZ and centerline lights are inoperative. These CAT II minimums (RVR 1200) are authorized under the selectable subparagraph g(2) in OpSpec/MSpec/LOA C059, and are the lowest minimums available to a runway with inoperative TDZ and/or centerline lights.

M. Lower Landing Minimums Maintenance Program. The operator/program manager must maintain the aircraft and equipment listed in Table 1 (see Figure 3-67F) in accordance with its approved Lower Landing Minimums (LLM) maintenance program or inspection program, as applicable.

N. Engine-Inoperative Operations. The operator may be authorized for engine-inoperative CAT III operations in accordance with the AFM and AC 120-28. Airplane M/M/S, operational requirements, and limitations must be listed in Table 5 (see Figure 3-67J, Example OpSpec/MSpec C060, Table 5 (LOA C060, Table 6)).

1) With preplanned engine-inoperative CAT III capability, airports and minimums that otherwise may not be considered acceptable for use could be selected by the pilot or operator without having to subsequently justify its use based on emergency authority. This capability also has the advantage of allowing for full preassessment of the aircraft capability and engine inoperative aircraft configurations (e.g., flap settings, electrical system capability, hydraulic system capability, etc.), approach procedure characteristics, missed approach performance, and other factors that may be difficult to assess in real time if not previously assessed.

2) This capability can also permit an operator some additional flexibility in selecting alternate airports. Authorization to use CAT III alternate airport weather minimums is given in OpSpec C055, and should be based on the authorization in Table 5 (see Figure 3-67J).

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3) Authorization to conduct engine-inoperative CAT III operations is based on the AFM and approved operator procedures and training. AC 120-28 describes in detail the requirements and considerations necessary for authorization. These include aircraft performance, configuration and systems requirements, crew training (if applicable), and dispatcher and crew preflight and en route planning and decisionmaking.

4) Operational authorizations are in accordance with AC 120-28. With preflight planning authorization, the operator may consider engine-inoperative CAT III capability in planning flights for a takeoff alternate, en route (Extended Operations (ETOPS) or Extended-Range Operations (ER-OPS)) alternate, redispatch alternate, destination, or destination alternate. With landing after engine failure en route authorization, the operator may initiate an engine-inoperative CAT III approach under the conditions specified in AC 120-28. With landing after engine failure during approach authorization, the operator may continue a CAT III approach after passing the final approach fix (FAF), unless required by the AFM to discontinue the approach in order to reconfigure the aircraft.

Figure 3-67J. Example OpSpec/MSpec C060, Table 5 (LOA C060, Table 6)

Engine Inoperative CAT III Operations		
Airplane M/M/S	**Operational Authorization**	**Limitations**
B-777	Preflight planning. Landing after engine failure en route. Landing after engine failure during approach.	Flaps 20 or 30. Minimum TCH: 40 feet.
B-747	Preflight planning. Landing after engine failure en route.	Flaps 25 or 30. Minimum TCH: 42 feet. Rudder trim or manual control required until below 1500 feet RA with LAND 3. 5-kt crosswind limit with rudder ratio system inoperative and engine inoperative.

O. Nonstandard Requests. All requests for operational nonstandard OpSpec/MSpec/LOA authorizations must be submitted to the Air Transportation Division (AFS-200) using the nonstandard request policy outlined in Volume 3, Chapter 18, Section 2, paragraph 3-713.

OPSPEC/MSPEC/LOA C061—FLIGHT CONTROL GUIDANCE SYSTEMS FOR AUTOMATIC LANDING OPERATIONS OTHER THAN CATEGORIES II AND III.

A. General. OpSpec/MSpec C061 authorizes an operator to use a flight control guidance system with automatic landing capabilities to touchdown. Title 14 CFR part 121, § 121.579(f); part 125, § 125.329(f); and part 135, § 135.93(f) specify that this type of operation must be

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authorized by an OpSpec. A 14 CFR part 91K program manager is issued MSpec C061, if applicable. Before issuing C061, the principal operations inspector (POI) must determine the following:

1) The Aircraft Flight Manual (AFM) permits use of the flight control guidance system (autoland system) to touchdown.

2) Training on the use of the flight control guidance system and autoland procedures to touchdown is provided to flightcrew members.

3) The operator continually maintains flight control guidance and autoland systems in accordance with an approved maintenance program for autoland operations.

NOTE: The current edition of Federal Aviation Administration (FAA) Order 8400.13, Procedures for the Evaluation and Approval of Facilities for Special Authorization Category I Operations and All Category II and III Operations, also provides credit for other-than-standard Category II (CAT II) minimums using an autoland system to touchdown.

B. Listing Flight Control Guidance Systems. The airplanes (make/model) and the flight control guidance systems (manufacturer/model) authorized for this type of operation must be listed in C061a.

C. Exceptions to Issuance of C061. When the autoland system is not used to touchdown on a Category I (CAT I) instrument landing system (ILS), C061 is not required to be issued.

D. Additional Information. The current edition of Advisory Circular (AC) 120-67, Criteria for Operational Approval of Auto Flight Guidance Systems, provides additional information.

OPSPEC/MSPEC/LOA C062—MANUALLY FLOWN FLIGHT CONTROL GUIDANCE SYSTEM CERTIFIED FOR LANDING OPERATIONS OTHER THAN CATEGORIES II AND III.

A. General. OpSpec/MSpec C062 is optional for 14 CFR parts 91K, 121, 125, and 135 operations to authorize operators to use manually flown flight control guidance systems to conduct approach and landing operations to fly a Category I (CAT I) instrument landing system (ILS) using a Head Up Display (HUD). C062 is issued to use an HUD just as C061 is issued to use an autoland system for other than Category II (CAT II) or Category III (CAT III) operations.

1) This authorization is independent of CAT II/III authorizations. Typically, this authorization is issued prior to CAT II/III authorizations and is kept after the issuance of CAT II/III authorizations.

2) The current edition of Federal Aviation Administration (FAA) Order 8400.13, Procedures for the Evaluation and Approval of Facilities for Special Authorization Category I

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Operations and All Category II and III Operations, also provides credit for lower-than-standard CAT I minimums using HUD to touchdown.

3) It is required to list series of aircraft in addition to make/model due to the distinct differences in series of models (especially in the newer aircraft). The aircraft listed must have a manual flight control guidance system installed and certified for manually flown landings (HUD).

B. Exceptions to Issuance of C062. When HUD guidance is not used to touchdown on a CAT I ILS, C062 is not required to be issued.

C. Requirements for Operators Conducting Operations in MD-11 Aircraft. National Transportation Safety Board (NTSB) safety recommendation A-99-40 recommends the FAA "issue a flight standards information bulletin that directs principal operations inspectors to ensure that MD-11 training programs provide simulator instruction in the proper procedure for autopilot disengagement and the subsequent manual control of the airplane." As a result, Flight Standards (AFS) recommends that principal operations inspectors (POI) ensure that each operator conducting operations in an MD-11:

1) Has included in its Company Flight Manual (CFM) information regarding the potential for pitch attitude upsets caused by improper operation of the autopilot and disseminate that information to each flightcrew member of the MD-11.

2) Has included simulator instruction in the proper operating procedure for autopilot disengagement and subsequent manual control of the airplane in its MD-11 initial, upgrade, recurrent, transition, and requalification training programs.

D. Helicopter Authorization. See OpSpec/MSpec H111, Manually Flown Flight Control Guidance System Certified for Landing Operations Other Than Categories II and III, for the helicopter equivalent of this authorization.

OPSPEC/MSPEC/LOA C063—AREA NAVIGATION (RNAV) AND REQUIRED NAVIGATION PERFORMANCE (RNP) TERMINAL OPERATIONS.

A. General. The authorization provided by OpSpec/MSpec/LOA C063 is applicable to certificate holders/operators/program managers conducting operations under 14 CFR parts 91K, 121, 125 (including the 125 Letter of Deviation Authority (LODA) A125 holders (125M)), and 135. (For 14 CFR part 129, see Volume 12, Chapter 2, Section 5.)

1) OpSpec/MSpec/LOA C063 authorizes certificate holders/operators/program managers to conduct operations using 14 CFR part 97 U.S. instrument flight rules (IFR) terminal Area Navigation 1 (RNAV 1) and/or Required Navigation Performance 1 (RNP 1) departure procedures (DP) and RNAV 1 and/or RNP 1 Standard Terminal Arrival Routes (STAR) in the National Airspace System (NAS). This guidance addresses RNAV 1, RNP 1, and other RNAV flight operations. It also provides guidance authorization for certificate holders/operators/ program managers to conduct RNP 1 procedures that include radius to a fix (RF) path terminators and tailored arrivals (TA). Part 91 operators do not need to obtain an LOA for RNAV 1 or RNP 1 approval.

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2) The term "RNAV 1 DP" or "RNP 1 DP" includes Standard Instrument Departures (SID) and Obstacle Departure Procedures (ODP).

NOTE: If a certificate holder/operator/program manager's aircraft are not eligible (properly equipped) and/or its flightcrews are not appropriately trained to conduct RNAV 1 and/or RNP 1 DPs and STARs, then the OpSpec/MSpec/ LOA C063 authorization should not be issued. RNP 1 requires Global Positioning System (GPS) and additional requirements for operating on procedures that contain RF legs, as outlined in the current edition of Advisory Circular (AC) 90-105, Approval Guidance for RNP Operations and Barometric Vertical Navigation in the U.S. NAS.

3) RF legs are an optional capability rather than a minimum requirement for RNP 1 operations. For RNP 1 systems incorporating RF leg capability, the systems must comply with the requirements in AC 90-105, appendix 2 for RNP 1 terminal operations, and AC 90-105, appendix 5 for RNP 1 operations with RF leg capability.

B. RNAV 1 and/or RNP 1 DPs and STARs. The current edition of AC 90-100, U.S. Terminal and En Route Area Navigation (RNAV) Operations, provides detailed guidance for certificate holders/operators/program managers regarding operations on RNAV 1 DPs and STARs.

1) AC 90-105 provides guidance for system and operational approval for conducting RNP 1 DPs and STARs.

2) For current ACs, policy, guidance, and compliance tables, see http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs400/afs470/pbn. For further questions, contact the Performance Based Flight Systems Branch (AFS-470) at 202-267-8790. Based on the information supplied by the certificate holder/operator/program manager, the principal operations inspector (POI) must coordinate with the principal avionics inspector (PAI) to determine equipment eligibility. For TAs, a Future Air Navigation System (FANS)-1/A is required, as indicated in OpSpec/MSpec/LOA A056.

3) Additional information may also be found in the Web-based Operations Safety System (WebOPSS) guidance associated with OpSpec/MSpec/LOA C063 by clicking on "Guidance."

C. Outlining Procedures Using This Approval. Procedures used under this approval should be outlined in the appropriate operations manual or within the OpSpec/MSpec/LOA C063 template for certificate holders/operators/program managers conducting operations under parts 91K, 125 (including 125 LODA A125 holders (125M)), and 135 who do not have an operations manual. Part 91 operators do not need to obtain an LOA for RNAV 1 or RNP 1 approval; any additional authorizations will require an LOA for these procedures.

D. Designation of RNAV 1 RNP 1. U.S. RNAV DPs and STARs throughout the NAS are designated as RNAV 1 and published in accordance with part 97. Charting specifications for part 97 U.S. RNP 1 DPs and STARs are currently under development.

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E. Definitions Related to This Authorization. Some important definitions as they relate to this authorization are as follows:

1) Instrument Departure Procedure (DP). Instrument DPs are published IFR procedures that provide obstruction clearance from the terminal area to the en route structure. There are two types of DPs: SIDs and ODPs.

a) A SID is a published IFR air traffic control (ATC) DP that provides obstacle clearance and a transition from the terminal area to the en route structure. SIDs are primarily designed for air traffic system enhancement to expedite traffic flow and to reduce pilot/controller workload.

b) An ODP is a published IFR DP that provides obstruction clearance via the least onerous route from the terminal area to the appropriate en route structure. ODPs are recommended for obstruction clearance unless an alternate DP (such as a SID or radar vector) has been specifically assigned by ATC. The RNAV 1 or RNP 1 ODP must be retrievable from the flight management system (FMS) database and included in the filed flight plan.

2) Climb Via. An ATC instruction in development that will be issued to pilots flying RNAV 1 DPs and RNP 1 DPs. The instruction is issued to enable pilots to vertically and laterally navigate (i.e., climb in accordance with published speed and/or altitude constraints) on a DP as published.

3) Descend Via. An ATC instruction issued to pilots flying RNAV 1 STARs, RNP 1 STARs, or Flight Management System Procedures (FMSP). The instruction is issued to enable pilots to vertically and laterally navigate (i.e., descend in accordance with published speed and/or altitude constraints) on an arrival procedure as published.

4) Flight Management System Procedure (FMSP). An RNAV arrival, departure, or approach procedure developed for use by aircraft equipped with an FMS.

NOTE: The number of FMSPs in the NAS is limited and FMSP criteria are no longer preferred for the design of RNAV procedures.

5) Standard Terminal Arrival Route (STAR). An RNAV STAR is a published IFR ATC arrival procedure that provides a transition from the en route structure to the terminal area.

6) Area Navigation 1 (RNAV 1) DPs and STARs. RNAV 1 terminal procedures require that the aircraft's trackkeeping accuracy remain bound by + 1 nautical mile (NM) for 95 percent of the total flight time. RNAV 1 terminal procedures require, at a minimum, a distance measuring equipment (DME)/DME/Inertial Reference Unit (IRU)-based and/or GPS-based RNAV system satisfying the criteria of AC 90-100.

7) Required Navigation Performance 1 (RNP 1) DPs and STARS. RNP 1 procedures meet a specific navigation accuracy performance value for a particular phase of flight or flight segment for 95 percent of the total flight time, and incorporate associated onboard

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performance monitoring and alerting features to notify the pilot when the RNP for a particular phase or segment of a flight is not being met. GPS is required for RNP 1 flight operations.

8) Tailored Arrival (TA). A TA is an unpublished instrument arrival that consists of an arrival clearance that is transmitted via data link to the aircraft while in oceanic airspace to a FANS-1/A-equipped aircraft. The transmitted RNAV 1 path contains altitudes and speed restrictions, and connects to a published instrument approach from the aircraft's FMS database.

F. Training. A certificate holder/operator/program manager's FAA-approved training program should include subject areas and frequency in accordance with the following:

NOTE: Certificate holders/operators not required to have approved training programs must include an RNAV 1 or RNP 1 DP, or an RNAV 1 or RNP 1 STAR, on each 14 CFR part 61 qualification check. If the certificate holder/operator receives authorization for an RNP 1 procedure with an RF leg, they must demonstrate this procedure.

1) General. Training and qualification should be conducted in the specific equipment being used and type of procedure(s) approved under OpSpec/MSpec/LOA C063. Training and qualification for RNAV 1 and RNP 1 are alike in many respects and credit should be considered where no differences are found between the two. Training should include the following subject areas for the type of operation requested, where applicable:

a) Procedures for verification that the correct procedure and runway are entered into the navigation system database prior to departure.

b) Recognition that some manually selectable aircraft bank-limiting functions might reduce the ability to satisfy ATC path expectations, especially during turns of 70 degrees or greater.

c) The importance of reducing Flight Technical Error (FTE) on RNAV 1 or RNP 1 procedures via use of equipment such as flight director (FD) and/or autopilot.

d) The meaning and proper use of aircraft equipment/navigation suffixes.

e) Procedure characteristics as determined from chart depiction and textual description.

- Depiction of waypoint type.
- Required navigation equipment.
- Phraseology.

f) Recognition of altitude and speed restrictions on RNAV 1 and RNP 1 procedures.

g) Use of autopilot/FD on RNAV 1 or RNP 1 procedures.

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h) RNAV system-specific information:

- Levels of automation, mode annunciations.
- Functional integration with other aircraft systems.
- The meaning and appropriateness of route discontinuities.
- Verification and monitoring procedures for each phase of flight.
- Types of navigation sensors.
- Turn anticipation with consideration to speed and altitude effects.
- Interpretation of electronic displays and symbols.

i) RNAV system operating procedures, as applicable, including how to perform the following actions:

- Verify currency of aircraft navigation data.
- Verify successful completion of system self-tests.
- Initialize navigation system position.
- Retrieve and fly a STAR procedure or DP.
- Adhere to speed and/or altitude constraints associated with DP or STAR operations.
- Make a runway change associated with a DP or STAR.
- Verify waypoints and flight plan programming.
- Perform a manual or automatic runway update.
- Fly direct to a waypoint.
- Fly a course/track to a waypoint.
- Intercept a course/track to a waypoint.
- Be vectored off and rejoin a procedure from “heading” mode.
- Determine cross-track error/deviation.
- Insert and delete/clear route discontinuity.
- Remove and reselect navigation sensor input(s).
- When required, confirm exclusion of a specific Navigational Aid (NAVAID).
- Insert and delete a lateral offset.
- Change arrival airport and alternate airport.
- Insert and delete a holding pattern.

j) Operator-recommended levels of automation:

- Levels of automation, mode annunciations.
- Functional integration with other aircraft systems.
- Monitoring procedures for each phase of flight.
- Types of navigation sensors.
- Turn anticipation with consideration to speed and altitude effects.
- Interpretation of electronic displays and symbols.

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k) Flightcrew contingency procedures for a loss of RNAV 1 or RNP 1 capability. Due to the lack of navigation guidance, the training should emphasize the flightcrew contingency actions that achieve separation from terrain and obstacles.

l) Procedures to obtain a receiver autonomous integrity monitoring (RAIM) prediction. (Systems are only required to provide Nonprecision Approach (NPA) RAIM predictions.) The operator can demonstrate compliance based on the information listed below:

1. A GPS RAIM prediction. As described in AC 90-100 and AC 90-105, if Technical Standard Order (TSO)-C129( ), Airborne Supplemental Navigation Equipment Using the Global Positioning System (GPS), equipment is used to solely satisfy the RNAV requirement, GPS RAIM availability must be confirmed for the intended route of flight (route and time) using current GPS satellite information. The availability of Satellite-based Augmentation System (SBAS) or Aircraft-Based Augmentation System (ABAS) fault detection can be determined through Notices to Airmen (NOTAM) (if available), or through prediction for the intended RNAV 1 or RNP 1 operation.

NOTE: For multisensor aircraft with operating GPS and DME/DME/IRU positioning, a RAIM check is not required as long as critical DMEs are functioning normally.

2. Certificate holders/operators/program managers may satisfy the predictive RAIM requirement through any one of the following methods:

a. Operators may monitor the status of each satellite in its plane/slot position by accounting for the latest GPS constellation status (e.g., NOTAMs or Notice: Advisory to Navstar Users (NANU)), and compute RAIM availability using model-specific RAIM prediction software;

b. Operators may use the FAA en route and terminal RAIM prediction Web site (http://www.raimprediction.net or http://www.raimprediction.faa.gov);

c. Operators may contact a Flight Service Station (FSS) (not Direct User Access Terminal System (DUATS)) to obtain NPA RAIM;

d. Operators may use a third-party interface, incorporating FAA/Volpe Center RAIM prediction data without altering performance values, to predict RAIM outages for the aircraft's predicted flightpath and flight times;

e. Operators may use the receiver's installed RAIM prediction capability (for TSO-C129a/Class A1/B1/C1 equipment) to provide NPA RAIM, accounting for the latest GPS constellation status (e.g., NOTAMs or NANUs). Receiver NPA RAIM should be checked at airports spaced at intervals not to exceed 60 NM along the RNAV 1 or RNP 1 procedure's flight track. Terminal or approach RAIM must be available at the estimated time of arrival (ETA) over each airport checked; or

f. Operators not using model-specific software or FAA/Volpe Center RAIM data will need FAA operational approval.

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3. In the event of a predicted, continuous loss of RAIM of more than 5 minutes for any part of the intended flight, the flight should be delayed, canceled, or rerouted to where RAIM requirements can be met. Pilots should assess their capability to navigate (potentially to an alternate destination) in case of failure of GPS navigation.

4. If TSO-C145, Airborne Navigation Sensors Using the Global Positioning System Augmented by the Satellite Based Augmentation System/TSO-C146, Stand-Alone Airborne Navigation Equipment Using the Global Positioning System Augmented by the Satellite Based Augmentation System, equipment is used to satisfy the RNAV requirement, the pilot/operator need not perform the prediction if wide area augmentation system (WAAS) coverage is confirmed to be available along the entire route of flight.

NOTE: Outside the United States or in areas where WAAS coverage is not available, operators using TSO-C145/TSO-C146 receivers are required to check GPS RAIM availability.

5. The current RAIM prediction Web site is graphic-based and the FAA is developing automation improvements to this prediction service.

m) RNAV Departure.

1. Takeoff Clearance. Pilots can expect a takeoff clearance from ATC that will provide instructions to depart the runway either via an RNAV path or via an assigned heading to be maintained. Special emphasis should be placed on common pilot errors on an RNAV departure. (See subparagraph F1)n).)

2. Equipment-Specific Training Considerations.

a. RNAV DP Engagement Altitudes. For DPs, the pilot must be able to engage RNAV equipment to follow flight guidance for lateral RNAV no later than 500 feet above airport elevation.

b. Lateral Navigation Mode. Pilots must use a lateral deviation indicator (LDI) (or equivalent navigation map display), FD, and/or autopilot in lateral navigation mode on RNAV 1 or RNP 1 routes. The full-scale course deviation indicator (CDI) deflection value of ±1 NM is acceptable.

c. DME/DME/IRU Aircraft. Pilots of aircraft without GPS/Global Navigation Satellite System (GNSS), using DME/DME/IRU, must ensure that the aircraft navigation system position is confirmed, within 1,000 feet, at the start point of the takeoff roll. The use of an automatic or manual runway update is an acceptable means of compliance (AMC) with this requirement. A navigation map may also be used to confirm aircraft position if pilot procedures and display resolution allow for compliance with the 1,000-foot tolerance requirement.

d. GNSS Aircraft. When using GNSS, the signal must be acquired before the takeoff roll commences.

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NOTE: For aircraft using TSO-C129/C129a, the departure airport must be loaded into the flight plan in order to achieve the appropriate navigation system monitoring and sensitivity. For aircraft using TSO-C145a/TSO-C146a avionics, if the departure begins at a runway waypoint, then the departure airport does not need to be in the flight plan to obtain appropriate monitoring and sensitivity.

n) Pilot Errors. Typical pilot errors should be included in the operator's training program. The following are examples of RNAV FMS entry errors:

1. Proper Interpretation of Pre-Departure Clearance (PDC) and Printed Clearance Routes. Pilots of operators using PDC and printed routes must be able to properly interpret their assigned clearance. Specifically, pilots must be able to recognize direct routings, assigned altitudes, revised clearances, SIDs, and en route transitions. As an example, some pilots incorrectly inferred that the absence of a period (".") in their PDC or printed clearance meant a direct routing. By making this assumption, their navigation system missed waypoints on the assigned en route transition segment. In the case of the NOBLY2 SID at Dallas/Fort Worth, a PDC with the routing of "NOBLY2 LIT" did not mean direct from NOBLY to LIT. In summary, pilots must understand their operator's PDC notation, and must request clarification from ATC if any doubt exists with regard to their clearance.

2. Correct Entry of Runway and En Route Transitions into RNAV System/FMS Prior to Takeoff. Prior to commencing takeoff, pilots must verify that their aircraft navigation system is operating correctly and that the correct airport, runway, and DP (including any applicable en route transition) have been entered and are properly depicted by their navigation system. Pilots who are assigned an RNAV 1 DP and who subsequently receive a change of runway, procedure, or transition must verify that the appropriate changes are entered and available for navigation. A final check of proper runway entry and correct route depiction, shortly before takeoff, is recommended.

3. Verification of Assigned Route and Correct Entry of Transitions into RNAV System/FMS.

a. DPs. Before flight, pilots must verify that their aircraft navigation system is operating correctly and that the correct runway and DP (including any applicable en route transition) are entered and properly depicted. Pilots who are assigned an RNAV 1 DP and who subsequently receive a change of runway, procedure, or transition must verify that the appropriate changes are entered and available for navigation. A final check of proper runway entry and correct route depiction, shortly before takeoff, is recommended.

b. STARs. Pilots must verify that their aircraft navigation system is operating correctly and that the correct arrival procedure and runway (including any applicable transition) are entered and properly depicted.

4. Use of Navigation Map Displays. Before takeoff, pilots of aircraft with a navigation map display should verify that the relationship of the aircraft position symbol to their assigned runway and route on their display matches external visual cues as well as charts. Specifically, once on or near their assigned runway, pilots should ensure that their navigation

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display reflects the same relative position to the runway, and that the route depiction reflects that of the respective chart. During flight, these displays should be used in concert with textual displays for route verification.

5. Manually Selectable Bank-Limiting Functions. Pilots should recognize that manually selectable aircraft bank-limiting functions might reduce their ability to satisfy ATC path expectations, especially when executing turns of 70 degrees or greater. Do not construe this request for awareness as a requirement to deviate from Aircraft Flight Manual (AFM) procedures; rather, pilots should be encouraged to limit the selection of such functions within accepted procedures.

2) RNAV 1—Additional Training. For multisensor aircraft with operating DME/DME/IRU positioning, critical DMEs should be checked via NOTAM for normal function. This could be checked by the flightcrews or a dispatcher.

3) RNP 1—Additional Training. Understand:

a) The required minimum equipment to operate on RNP 1 procedures.

b) The importance of identifying on RNP 1 charted procedures that contain RF legs and associated equipment capability.

c) The importance of maintaining the published path and maximum airspeeds while performing RNP operations with RF legs.

4) TA—Additional Training. Pilots must verify that the TA loaded correctly with no discontinuities or other obvious errors. If errors or discontinuities exist, pilots must reject the TA and request that it be resent, or must transition to another arrival. See subparagraph I for additional TA information.

5) Recurrent Training and Continuing Qualification. Recurrent training and continuing qualification should be based upon the following:

a) These RNAV 1 and/or RNP 1 procedures should be trained to proficiency during the flightcrew member's first training sequence in the specific airplane type with equipment being used by the certificate holder/operator/program manager.

b) Pilot proficiency should be validated during each recurrent training or continuing qualification cycle (i.e., every 12 months) in the use of RNAV 1 or RNP 1 DPs and STARs that the operator is approved to use, in accordance with the certificate holder/operator/ program manager's FAA-approved training program. This may be accomplished during Line-Oriented Flight Training (LOFT), a Line-Operational Simulation (LOS), or another course of training, as appropriate. For training and checking, the pilot need only demonstrate RNAV 1 or RNP 1.

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NOTE: Certificate holders/operators/program managers not required to have approved training programs must include an RNAV 1 or RNP 1 DP, or an RNAV 1 or RNP 1 STAR, on each part 61 qualification check. If the certificate holder/operator receives authorization for an RNP 1 procedure with an RF leg, they must demonstrate this procedure.

G. Aircraft Eligibility for RNAV 1 and RNP 1. Certificate holders/operators/program managers and pilots should use the guidance in AC 90-100 to determine their eligibility for domestic U.S. RNAV 1 terminal procedures. Certificate holders/operators/program managers should use the guidance in AC 90-105 to identify if their aircraft's system performance meets the performance requirements for RNP 1 operations. For the purpose of this authorization, "compliance" means meeting operational and functional performance criteria.

NOTE: Aircraft compliant with the current edition of AC 90-45, Approval of Area Navigation Systems for Use in the U.S. National Airspace System, may not be compliant with the criteria in AC 90-100.

NOTE: Per AC 90-100 and AC 90-105, data suppliers and avionics data suppliers must have an LOA in accordance with the current edition of AC 20-153, Acceptance of Aeronautical Data Processes and Associated Databases. Operators must ensure that data supplier(s) are compliant. Aircraft/equipment with approval under AC 90-100 for use of GPS are approved under AC 90-105 for RNP operations.

1) RNAV 1 procedures require DME/DME/IRU sensors and/or GPS inputs. Due to gaps in the DME infrastructure of the NAS, RNAV 1 procedures require IRU sensor inputs to augment DME/DME, which is often referred to as DME/DME/IRU.

2) The certificate holder/operator/program manager is responsible for providing equipment eligibility documented by the AFM or other FAA-recognized means. If the operator is unable to determine that the aircraft is eligible, it must provide the following required documentation for RNAV 1 terminal procedures to the certificate-holding district office (CHDO):

- RNAV system make, model, and part number(s);
- Evidence of compliance with AC 90-100 or AC 90-105 criteria;
- Crew operations procedures;
- Evidence of control of operation procedures;
- Crew training program;
- Evidence of control of Navigation Database (NDB) processes; and
- Any other pertinent information.

NOTE: AC 90-100 includes terminology harmonized with International Civil Aviation Organization (ICAO) procedures. Formerly classified as either Type A or Type B procedures, they are now referred to as RNAV 1 procedures.

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3) Based on the information supplied by the operator, the POI must coordinate with the PAI to determine equipment eligibility in accordance with the RNAV 1 DPs and STARs compliance table. An aircraft equipment compliance table is also available in the WebOPSS guidance associated with all OpSpec/MSpec/LOA C063 templates and via the AFS-470 Web site at http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs400/afs470.

a) As described in the AC 90-100 and AC 90-105, the term "compliance" means meeting the operational and functional performance criteria. For the intended purpose of this policy, "compatible" means equipment and systems that perform their intended function and that meet performance requirements for RNAV 1 and RNP 1 operations.

b) The PAI determines the proper nomenclature of the equipment manufacturer's make, model, and software version, and that the RNAV equipment and system is installed in accordance with approved data and meets the criteria of the most recent version of AC 90-100 or AC 90-105. To ensure the proper configuration control of the approved RNAV operating system, it is required to list both the hardware and the software part numbers or version/revision numbers in Table 1 of OpSpec C063.

c) If the CHDO is unable to determine equipment eligibility for RNAV 1 or RNP 1 DPs and STARs via the AFS-470 Web site, contact AFS-470 for guidance.

4) Based on the information supplied by the certificate holder/operator/program manager, the POI must coordinate with the PAI to determine if the aircraft's system meets the performance and functionality requirements for RNP 1 operations. The equipment shall not permit the flightcrew to select a procedure or route that is not supported by the equipment, either manually or automatically (e.g., a procedure is not supported if it incorporates an RF leg and the equipment does not provide RF leg capability).The system must also restrict pilot access to procedures requiring RF leg capability if the system can select the procedure, but the aircraft is not otherwise equipped (e.g., the aircraft does not have the required roll steering autopilot or FD installed).

5) Some RNAV equipment and systems may not be able to perform multiple STAR runway transitions, sometimes known as route Type 3, because of database limitations. Operators of such RNAV systems must procure a tailored database and charts to allow the use of multiple runway transitions in order to qualify for RNAV 1 approval.

6) After the POI and PAI agree that the certificate holder/operator/program manager's navigation equipment, procedures, and flightcrew training are eligible for RNAV 1, RNP 1, or RNP with RF DP and STAR operations, the OpSpec/MSpec/LOA C063 template may be issued, indicating the appropriate authorizations in the "Authorizations" column of Table 1.

H. Certificate Holders and Program Managers Authorized European Precision Area Navigation (P-RNAV) Operations. The criteria in AC 90-100, required for U.S. RNAV procedures, are generally consistent (but there are exceptions) with the criteria for P-RNAV operations in Europe.

1) P-RNAV terminal and en route operations require a trackkeeping accuracy of ± 1 NM for 95 percent of the flight time.

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2) If an operator has met the requirements for and is authorized P-RNAV (OpSpec/MSpec/LOA B034), that operator may also be eligible for RNAV 1 after consideration of the issues listed below regarding equipment. POIs should still evaluate their operator's procedures and training to ensure compliance with AC 90-100.

a) If approval for the P-RNAV included the use of very high frequency (VHF) omni-directional range station (VOR)/DME, then RNAV system performance must be based on the GNSS, DME/DME, or DME/DME/IRU for RNAV 1. However, VOR/DME inputs do not have to be inhibited or deselected.

b) If approval for the P-RNAV included the use of DME/DME, the operator can ask the manufacturer or check the FAA Web site for a list of compliant systems. However, DME/DME-only systems are not authorized to conduct RNAV 1 operations.

c) Operators must be able to follow RNAV guidance no later than 500 feet above field elevation (AFE).

3) Appropriate P-RNAV references.

a) The current edition of AC 90-96, Approval of U.S. Operators and Aircraft to Operate Under Instrument Flight Rules (IFR) in European Airspace Designated for Basic Area Navigation (B-RNAV) and Precision Area Navigation (P-RNAV);

b) Joint Aviation Authority (JAA) temporary guidance leaflet (TGL) Number 10, Airworthiness and Operational Approval for Precision RNAV Operations in Designated European Airspace; and

c) Volume 3, Chapter 18, Section 4, OpSpec/MSpec/LOA B034.

I. TAs. Currently, the TA model is limited and TAs are preplanned fixed routes received via data link from ATC's Ocean21 system to FANS-1/A-equipped aircraft. Except for the instrument approach portion of the operation, these routes are neither stored in the aircraft NDB nor published.

1) TAs Consist of Three Elements.

- Delivery of the TA clearance through the ATC Ocean21 system via data link to FANS-1/A-equipped aircraft;
- An RNAV lateral, vertical, and speed profile; and
- Connection to a published instrument approach stored in the aircraft NDB.

2) TA Clearances. Because TAs are complex clearances, only aircraft with an FMS autoload/uplink function can request a TA. Pilots may not manually enter a TA procedure into the FMS. ATC issues TA clearances. Pilots fly the TA procedure according to the operator's standard operating procedures (SOP).

3) Approval. The POI should contact the Air Transportation Division (AFS-200) and AFS-470 at FAA headquarters (HQ) for concurrence prior to issuing the appropriate

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OpSpec, MSpec, or LOA. If the POI, AFS-200, and AFS-470 agree that the operator is authorized to conduct TA operations, authorization should be given by adding TA into the "Authorization" column of Table 1.

4) Certificate holders/operators/program managers must have all the following OpSpecs/MSpecs/LOAs for TA authorization:

a) OpSpec A056. OpSpec A056 will include FANS-1/A equipment in Table 1.

b) OpSpec B050.

c) OpSpec C063. In the "Limitations and Provisions" column of Table 1 add the following phrase: "Operator is authorized to conduct TAs with FANS-1/A-equipped aircraft listed in OpSpec A056." If the POI wishes to restrict the authorization to only specific airports, this may also be added to the "Limitations and Provisions" column of Table 1.

J. References (current editions):

- Title 14 CFR Part 91, §§ 91.123, 91.205, and 91.503.
- Title 14 CFR Part 95.
- Title 14 CFR Part 121, § 121.349.
- Title 14 CFR Part 125, § 125.203.
- Title 14 CFR Part 135, § 135.165.
- Order 1050.1, Environmental Impacts: Policies and Procedures.
- Order 7100.9, Standard Terminal Arrival Program and Procedures.
- Order JO 7110.65, Air Traffic Control.
- Order JO 7400.2, Procedures for Handling Airspace Matters.
- Order 8260.3, United States Standard for Terminal Instrument Procedures (TERPS).
- Order 8260.19, Flight Procedures and Airspace.
- AC 20-153, Acceptance of Aeronautical Data Processes and Associated Databases.
- AC 90-45, Approval of Area Navigation Systems for Use in the U.S. National Airspace System.
- AC 90-96, Approval of U.S. Operators and Aircraft to Operate Under Instrument Flight Rules (IFR) In European Airspace Designated for Basic Area Navigation (B-NAV)/RNAV 5 and Precision Area Navigation (P-RNAV).
- AC 90-100, U.S. Terminal and En Route Area Navigation (RNAV) Operations.
- AC 90-105, Approval Guidance for RNP Operations and Barometric Vertical Navigation in the U.S. National Airspace System.
- ICAO Global Operational Data Link Document (GOLD).

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OPSPEC C064—TERMINAL AREA IFR OPERATIONS IN CLASS G AIRSPACE AND AT AIRPORTS WITHOUT AN OPERATING CONTROL TOWER—NONSCHEDULED PASSENGER AND ALL CARGO OPERATIONS. C064 authorizes an operator to conduct nonscheduled passenger and all cargo (scheduled and nonscheduled) terminal area instrument flight rules (IFR) operations in Class G airspace or into airports without an operating control tower, with the following limitations and provisions:

A. Operation Information. Before authorizing C064, the principal operations inspectors (POI) must ensure that the operator has sufficient content in its manual(s) and training program to cover common traffic advisory frequency (CTAF) and pilot controlled lighting (PCL) information and procedures. The POI must also determine that the operator has a method or procedure for obtaining and disseminating necessary operation information. This operation information must include the following:

1) The airport is served by an authorized instrument approach procedure (IAP) (and departure procedure when applicable);

2) Applicable charts for crewmember use;

3) Operational weather data from an approved source for control of flight movements and crewmember use;

4) Status of airport services and facilities at the time of the operation;

5) Suitable means for pilots to obtain traffic advisories (TA); and

6) Sources of TA and airport advisories.

B. Radio Sources of Air TA Information. Certificate holders may be authorized to use any two-way radio source of air TA information listed in the Aeronautical Information Manual (AIM) (for operations in U.S. airspace) or equivalent Aeronautical Information Publications (AIP) (for foreign operations).

1) These sources include CTAFs, Aeronautical Advisory Stations (UNICOM), Aeronautical Multicom Stations (MULTICOM), and Flight Service Stations (FSS).

2) In those cases where two sources are listed at the same airport, inspectors must ensure that the operator’s manuals have procedures that require pilots to continuously monitor and use the TA frequency when operating within 10 nautical miles (NM) of the airport. The procedures should require communication concerning airport services and facilities to be completed while more than 10 NM from the airport.

3) At some airports, no public use frequencies may be available. In those cases, a certificate holder must arrange for radio communication of essential information including surveillance of local or transient aircraft operations by ground personnel. Ground personnel who operate a company radio for airport status and TA must be able to view airspace around the airport.

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C. Issuance of C064 for C081 Authorization. OpSpecs C064 and/or C080 may need to be issued to the certificate holder in order for the OpSpec C081 to be issued. C081 authorizes the use of special (non-14 CFR part 97) IAPs or departure procedures (DPs).

D. Other Authorizations. C064 is applicable to 14 CFR part 121, 125, 121/135, and 135 certificate holders. For helicopter authorization, see OpSpec H121. Title 14 CFR part 91 subpart K (part 91K) program managers should use MSpec A014 for Class G operations.

OPSPEC C065—POWERBACK OPERATIONS WITH AIRPLANES.

A. General. C065 authorizes the use of powerplant reversing systems for rearward taxi operations. Before issuing C065, the principal operations inspector (POI) must determine whether the operator meets requirements discussed in AC 120-29, Criteria for Approval of Category I and Category II Weather Minima for Approach, current edition. Airplane types' make, model, and series (M/M/S) authorized for powerback operations must be listed in C065. Airports where powerback operations are authorized must also be listed. If the POI and/or operator determine that restrictions to powerback operations are required at certain gates or ramp areas, the restrictions must be described (adjacent to the airport name) in the "Restrictions and Limitations" column. OpSpecs worksheets provide a template for listing authorized airplanes, airports, and restrictions.

B. Policies and Procedures for Ground Personnel During Ground Operations. Title 14 CFR part 121, §§ 121.133 and 121.135, part 134, § 134.23, and part 135, § 135.21, require certificate holders to prepare manuals setting forth procedures and policies that must be used by ground and maintenance personnel in conducting their ground operations. Sufficient procedures must be established to maintain an adequate level of passenger and company ground personnel safety during ramp operations. Procedures should emphasize safety during boarding and deplaning of passengers or cargo, specifically during times when an engine(s) may be running or a propeller(s) is turning during ground operations. Procedures should include, as a minimum, a means for defining no access areas around the propeller(s), as well as the landing gear and tugs, during push and ground marshaling operations. Policies should provide that an adequate number of ground personnel are assigned to ensure safety of company personnel and passengers.

C. Pushback and Ground Marshaling. Procedures for pushback and ground marshaling activities should be clearly defined and should include safety precautions and signals, and should ensure adequate visibility of assigned personnel during the time of aircraft movement.

D. Increased Awareness. FAA air carrier surveillance programs should emphasize increased awareness by inspectors and the strict need to follow safety procedures around turning propellers, in marshalling and pushback procedures, and/or other ground activities.

E. Other References. Additional references can be found in National Transportation Safety Board (NTSB) Recommendations 91-297, 91-298, and 93-146, and Air Carrier Operating Bulletin (ACOB) 8-94-2, Safety in Ground Operations.

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OPSPEC C067—SPECIAL AIRPLANE AUTHORIZATIONS, PROVISIONS, AND LIMITATIONS FOR CERTAIN AIRPORTS.

A. General. OpSpec C067 authorizes certificate holders to operate airplanes into certain airports. The authorizations include the following:

1) Title 14 CFR part 121 air carriers to conduct passenger-carrying operations into uncertificated airports (see subparagraph C);

2) Part 121 air carriers to conduct operations at airports that require curfew limitations for flights into or out of specific airports (see subparagraph D);

3) Part 121 or 14 CFR part 135 air carriers to conduct operations into airports that have operational considerations such as special aircraft performance charts and equipment, special lighting (flare pots, etc.), or unpaved runways (see subparagraph D);

4) Part 121 or 135 air carriers to conduct operations using the Reginald Bennett International Runway (RBI) Reflectorization System in Alaska (see subparagraph D); and

5) Part 135 transport category airplane deviations from part 135, § 135.376(a)(3) or § 135.379(d). (See subparagraph D and Volume 4, Chapter 3, Section 5.)

B. Authorizations Where Other OpSpecs Are Applicable.

1) OpSpec C050 for "special PIC qualification airports" is applicable to the authorization described in part 121, § 121.445. Do not list special pilot in command (PIC) qualification airports in OpSpec C067 unless one of the items in subparagraph A also applies.

2) OpSpec C081 should be used for listing the airports/runways where the Flight Technologies and Procedures Division (AFS-400) has approved specific "special" instrument procedures for a certificate holder.

3) OpSpec C058 is used for authorizing specific foreign Terminal Instrument Procedures (TERPS).

4) OpSpec C064 and C080 are used for authorizing a certificate holder to conduct airplane operations in airport terminal areas in Class G and E airspace.

5) OpSpec C070 is used for authorizing airports where certificate holders conduct scheduled operations.

C. Uncertificated Airports.

1) In accordance with § 121.590(c) and (e), a certificate holder may be authorized to conduct passenger-carrying airplane operations into an airport (nonmilitary) operated by the U.S. Government that is not certificated under 14 CFR part 139 if those airports meet:

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a) The equivalent safety standards for airports certificated under part 139, and

b) The equivalent airport classification requirements under part 139 to serve the type airplanes to be operated and the type of operations to be conducted.

2) Authorization to use such airports may be granted by entering the location/identifier of each airport, and the make and model (if applicable) of the airplanes to be operated in Table 3-24, Sample of Airports and Special Provisions:

a) Operators should obtain permission from the airport manager of nonmilitary airports to operate at these airports before starting operations.

b) This permission is not needed for operations at joint-use civil and military airports.

3) The FAA may authorize a certificate holder to conduct passenger-carrying airplane operations into a domestic military airport that is not certificated under part 139 (by selecting this text in the OpSpec) if the certificate holder ensures the following in advance of starting operations into that airport:

a) Certificate holders should obtain permission from the base commander of military airports that are not certificated under part 139 in advance of commencement of operations.

b) In accordance with the requirements of § 121.590, certificate holders must ensure that the airport:

1. Meets the equivalent safety standards for airports certificated under part 139, and

2. Meets the equivalent airport classification requirements under part 139 to serve the type airplanes to be operated and the type of operations to be conducted.

D. Other Special Authorizations.

1) Other special authorizations include those that may require special operational considerations and special flightcrew member training. (See guidance in Volume 4, Chapter 3, Section 5, paragraph 4-601.) These authorizations may include but are not limited to:

a) Operations into airports with special runway markings, such as flare pots or trees;

b) High-altitude airports with special airplane performance requirements;

c) Airports in or near precipitous terrain (§ 135.363(h)); and

d) Airports with unpaved runways or runways constructed on frozen lakes and rivers.

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2) Special authorization for conducting operations at airports in Alaska. For authorization to conduct airplane operations using the RBI Runway Reflectorization System in Alaska:

a) The air carrier must provide a station agent at the airport trained to give wind information to the flightcrew, and

b) The air carrier must train its flightcrews on this specific system in accordance with an approved training program. The training program must be approved in accordance with the following criteria:

1. Each pilot must receive initial and follow-on recurrent training in accordance with the company approved training program.

2. Ground and flight personnel must complete initial training before participation with this authorization.

3. Recurrent training must be completed every 12 calendar-months following completion of initial training.

4. Whenever a person who is required to take this recurrent training completes the training in the calendar-month before or the calendar-month after the month in which this recurrent training is required, that person is considered to have completed it in the calendar-month in which it was required.

NOTE: The sample Table 3-24 shows how to provide authorization for conducting operations after curfew hours at specific airports or use of the RBI Runway Reflectorization system at specific airports in Table 3-24 of OpSpec C067.

3) Unpaved Runways for Turbojet Operations. To use an airport with unpaved runways, an operator is required to have special operational procedures and flightcrew member training. For approval of operations at an airport with unpaved runways, the principal operations inspector (POI) must identify the airport and reference the appropriate section of the operator's manuals in Table 3-24 of OpSpec C067. See Volume 4, Chapter 3, Section 5.

4) You may list in OpSpec C067 flag or supplemental destination airports that do not have an available alternate airport (in accordance with § 121.621(a)(2) or § 121.623(b)), for use by airplanes that are dispatched in accordance with the required fuel reserves set forth in § 121.641(b) or § 121.645(c).

5) Although the FAA does not encourage operators to list aircraft limitations at certain airports during curfew hours in their OpSpecs, if an airport authority requires operators to list these limitations in their OpSpecs, then operators may list them in Table 3-24 of OpSpec C067. A sample of Table 3-24, below, shows an example of limitations for air carrier operations into specific airports during curfew hours.

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Table 3-24. Sample of Airports and Special Provisions

Airport Location/Identifier	Aircraft M/M (enter N/A if not applicable)	Special Provisions and Limitations and Special Flightcrew Member Training
PKEK, Ekwok, Alaska	N/A	A station agent is required to give wind information to the flightcrews and the flightcrew must have completed the required approved training on the RBI Runway Reflectorization System.
DCA, Ronald Reagan Washington National Airport	Boeing 737-800	Limitations during the curfew hours. Boeing 737-800 Max Takeoff—159,000 pounds. Max Landing—137,600 pounds.
Tahiti Island, Society IS; PPT/NTAA	N/A	Approved as destination airport without an available alternate.

6) Deviation from the requirement to obtain obstacle clearance data for takeoff. This OpSpec provides for the authorization of certain transport category airplanes a deviation from § 135.367(a)(3) or § 135.379(d). Guidance for this deviation authorization is contained in Volume 4, Chapter 3, Section 5, paragraph 4-599. To authorize this deviation, it must be listed in OpSpec A005 and the following statement must be selected in OpSpec C067:

> "The certificate holder is authorized to conduct takeoff operations using transport category airplanes weighing no more than 19,000 pounds and having a seating configuration of no more than 19 passenger seats without showing compliance with part 135, §§ 135.367(a)(3) and 135.379(d). This authorization is limited to only the following operations conducted:
>
> - At airports of 4,000 feet mean sea level or less field elevation;
> - On runways on which the available length of runway is equal to or greater than 150 percent of the runway required by part 135, § 135.367(a)(1) and (2) or part 135, § 135.379(c), as applicable; and
> - In weather conditions equal to or greater than straight-in Category I landing minimums for the runway being used."

OPSPEC C068—NOISE ABATEMENT DEPARTURE PROFILES (NADP) ITEM 7K.

A. General. C068 authorizes an operator to conduct Noise Abatement Departure Profiles (NADP) using aircraft with a maximum certificated gross takeoff weight (GTOW) of more than 75,000 pounds. Operators may use either or both of two standard NADPs as described in Advisory Circular (AC) 91-53, Noise Abatement Departure Profiles, current edition.

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B. Compliance of Vertical Departure Profiles. Before authorizing this paragraph, the principal operations inspector (POI) must ensure that all airplane vertical departure profiles described in the certificate holder operations and/or training manuals comply with the minimums criteria established in AC 91-53 for NADPs (close-in and distant) before approving paragraph C068 for the certificate holder's OpSpecs. The certificate holder must not use any other departure profile (except as stated in 14 CFR part 91) that is not defined within the AC.

NOTE: Use of part 91 procedures does not require OpSpecs authorization. If the operator does not meet the criteria established in AC 91-53, then OpSpec C068 will not be issued.

C. Proposed Exceptions to This OpSpec. Proposed exceptions to the criteria as stated in this OpSpec, which would be less limiting (less than 800 feet above field elevation (AFE)), must be addressed by the certificate holder to the certificate holder's POI for concurrence by the Flight Technologies and Procedures Division (AFS-400) of the Flight Standards Service (AFS).

D. Criteria for Close-In and Distant NADPs. AC 91-53, effective July 22, 1993, established minimum acceptable criteria for speed, thrust settings, airplane configurations, and the criteria for both the close-in and distant NADPs. These NADPs can be combined with preferential runway selection and flightpath techniques to minimize noise impact. For helicopter information, see the current edition of AC 91-66, Noise Abatement for Helicopters.

NOTE: The distant departure profile requires an initiation of flaps/slats retraction prior to thrust cutback initiation with the thrust cutback initiation at an altitude of no less than 800 feet AFE. Configuration changes necessary to meet regulatory performance or operations requirements will not be affected by this procedure. For those airplanes that have a performance requirement to reduce takeoff flaps to an intermediate takeoff flap setting at 400 feet AFE or above, the next flap/slats retraction should be initiated at an altitude of no less than 800 feet AFE.

OPSPEC C070—AIRPORTS AUTHORIZED FOR SCHEDULED OPERATIONS.

A. General. Under 14 CFR part 119, § 119.49, the OpSpecs must prescribe the authorizations and limitations for each type of operation. All regular airports shall be listed in the OpSpecs of all operators conducting scheduled operations. This includes domestic operations, flag operations, and commuter operations. Provisional and refueling airports will be listed for 14 CFR part 121 domestic and flag operations:

- Airport name,
- Three-letter identifier of the airport,
- Airplanes authorized to use the airport, and
- A notation as to whether the airport is regular (R), refueling (F), or provisional (P) for each type of airplane authorized (refueling and provisional airports are not applicable to part 135 operators).

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NOTE: If an airport is designated as provisional, the regular airport or airports for which it serves as a provisional airport must be annotated. (Except in unique situations, an airport should not be designated as a provisional airport if it is located more than 100 statute miles outside of the metropolitan area served by the regular airport.)

B. Requirements for List of Airports. If the operator provides a list of airports to be incorporated into C070, this list must provide the same type of information discussed in subparagraph A. This list must be annotated with the effective date of the listing.

C. List of Alternate Airports. C070 specifies that the operator must maintain a list of alternate airports that can be used. This list of alternates may be integrated into the list provided by the operator, if desired. The principal operations inspector (POI) should occasionally inspect the list of alternates to determine airport and airplane compatibility.

OPSPEC/LOA C071—AUTOPILOT MINIMUM USE ALTITUDES/HEIGHTS (MUH).

A. Applicability. OpSpec/LOA C071 is a mandatory authorization for certificate holders/operators who want to operate an autopilot below 500 feet above ground level (AGL), during takeoff or approach operations. Autopilot minimum use altitudes/heights (MUHs) in this OpSpec/LOA are applicable to 14 CFR parts 121, 125 (including 125 Letter of Deviation Authority (LODA) holders), and 135. OpSpec/LOA C071 will base its authorization on part 121, § 121.579; part 125, § 125.329; and part 135, § 135.93. OpSpec/LOA C071 does not replace or override OpSpec/LOA C059, Category II Instrument Approach and Landing Operations (Optional: 14 CFR Parts 121, 125, 125M, and 135 Operators) and Special Authorization Category I Instrument Approach and Landing Operations; OpSpec/LOA C060, Category (CAT) III Instrument Approach and Landing Operations; or OpSpec C061, Flight Control Guidance Systems For Automatic Landing Operations Other Than Categories II and III authorizations. The Administrator has authorization to require an altitude higher than the Airplane Flight Manual (AFM).

1) Approved Airplanes and Equipment. Table 1 lists the airplane configuration and the associated MUHs approved for each individual phase of flight. Airplanes with same M/M/S, but equipped with a different autopilot model/version and MUHs must be listed separately.

NOTE: This OpSpec/LOA uses “altitude/height” when referencing MUHs. AFMs use “altitude” or “height” in referencing MUH.

Table 1 – Approved Airplanes, Equipment and MUHs

Airplane Type (M/M/S)	Autopilot Manufacturer	Autopilot Model/Version	Minimum Use Heights/Altitudes (feet)		
			Takeoff/Initial Climb	Enroute	Approach

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2) Determining MUHs. Specified MUHs and/or specified altitude/height losses published in the AFM will be the basis for this OpSpec/LOA. The following criteria will be used by this OpSpec/LOA to authorize any alternatives to these altitudes:

a) If the Flight Standardization Board (FSB) report recommends a higher altitude than the AFM, the higher FSB (Administrator) altitude will be the authorized altitude.

b) If an FSB report is not available, or does not address autopilot use altitudes, the lowest authorized altitude in the AFM will be used.

c) If an FSB report is not available and the AFM does not address autopilot use altitudes/heights, the lowest authorized altitude/height shall be the basic MUH for a given phase of flight.

3) Takeoff/Initial Climb and Go-Around/Missed Approach Engagement Height. The basic minimum engagement height for an autopilot on takeoff/initial climb and go-around/missed approach is 500 ft. The following exceptions to the 500 ft. basic engagement height are:

a) A higher altitude/height if doubling the “altitude/height loss” specified in the AFM is greater than 500 ft.,

b) A minimum engagement altitude is specified in the AFM, or

c) An altitude/height recommended by FSB, that is no lower than the AFM or double the “altitude/height loss.”

4) Enroute MUHs. The lowest MUH during enroute operations is 500 ft. above the ground, except as follows:

a) If doubling the “altitude/height loss” specified in the AFM results in an altitude/height greater than 500 ft., or

b) A greater altitude recommended by FSB.

5) Approach MUHs. The MUH during approach operations is no lower than 50 ft. below the lowest DA/H or MDA/H for the instrument procedure being flown, except as follows:

a) For autopilots with an AFM specified altitude/height loss for approach operations:

1. An altitude no lower than twice the specified altitude/height loss if greater than 50 ft. below the DA/H or MDA.

2. An altitude no lower than 50 ft. higher than the altitude loss specified in the AFM when:

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a. Reported weather conditions are less than the basic VFR weather conditions in 14 CFR part 91, § 91.155,

b. Suitable visual references specified in § 91.175 have been established on the instrument approach procedure (IAP), and

c. The autopilot is coupled and receiving both lateral and vertical path references.

3. An altitude no lower than the greater of the altitude loss specified in the AFM or 50 ft. when:

a. Reported weather conditions are equal to or better than the basic VFR weather conditions in § 91.155, and

b. The autopilot is coupled and receiving both lateral and vertical path references.

4. A greater altitude recommended by FSB.

b) For autopilots with AFM specified approach altitude/height limitations, and the autopilot is coupled and receiving both lateral and vertical path references, the greater of:

1. The MUH specified for the coupled approach mode selected,

2. Fifty feet, or

3. An altitude recommended by FSB.

c) For autopilots with an AFM specified negligible or zero altitude loss for an autopilot approach mode malfunction, and the autopilot is coupled and receiving both lateral and vertical path references, the greater of:

1. Fifty feet, or

2. An altitude specified by Administrator.

6) Types of Certificates. Airplanes with specified MUHs, specified negligible or zero height loss, or specified height loss will meet the following criteria:

a) Will be published in the AFM and the autopilot approved in accordance with an FAA type certificate (TC).

b) Will be published in an AFM supplement and issued as a Supplemental Type Certificate (STC).

7) AFM. The AFM and its supplements are the primary resource for establishing autopilot MUHs and issuing OpSpec/LOA C071. The AFM contains operational procedures and limitations approved by Aircraft Certification Offices (ACO).

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8) Aircraft Evaluation Group (AEG). The principal operations inspector (POI) may use the AEG as a liaison between the PI and ACO during the AFM approval process when there are any questions regarding the AFM, FSB, or any other subject found in the list above.

9) Operator Produced Manuals. An Airplane Operations Manual (AOM), General Operations Manual (GOM), or Flightcrew Operating Manual (FCOM) is an operator published document. Although produced in accordance with parts 121, 125, and 135, use information directly from AFM to issue OpSpec/LOA C071. Do not solely use information from operator produced manuals to issue OpSpec/LOA C071. The AFM establishes the basis for the limitations, operational procedures, and performance sections published in these documents.

10) Manuals with Takeoff Procedures. Some AOMs, GOMs, or FCOMs contain procedures for systems not specifically designed with a takeoff or approach mode. Do not use these types of procedures as a basis for approving procedures and training programs that relate to achieving necessary takeoff or approach performance.

a) Principal inspectors (PI) approving, or who have approved, performance-related takeoff or approach procedures and training for systems not specifically designed with these modes should coordinate with the responsible AEG.

b) The AEG, in coordination with the responsible ACO, should be able to provide inputs on the procedure, and propose conditions and limitations, if any, as appropriate.

B. Training Program. Flightcrews must be trained in accordance with the certificate holder/operator's training program. Certificate holder/operator training programs should specifically address the following topics:

1) Autopilot function, use, and limitations relative to approach and navigational source used.

2) Flight management system (FMS) function, use, and limitations relative to approach and navigational source used.

3) Procedures, modes, and configurations for flying an autopilot coupled approach.

4) Applicable monitoring and cross check requirements.

5) Suitable accuracy checks using control display unit (CDU) pages or flight instrument displays.

6) Display use, including deviation indications and display scaling.

7) Pilot Flying (PF) and pilot monitoring (PM) duties and callouts during: descent, approach, landing, and missed approach.

8) Understanding and interpretation of U.S. terminal procedures (e.g., departure procedures, Standard Terminal Arrival Routes (STAR), and IAPs).

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9) Understanding, interpretation, and proper response to appropriate failure indications prior to initiation of an approach or during an approach.

10) Proper techniques to accomplish any special flight deck procedure specified by the certificate holder/operator for the approach type used or for the particular approach to be flown.

11) Any unique issues particular to a specific approach or family of approach procedures, airplane or FMS.

12) Proper techniques for executing a missed approach during any segment of the approach with the autopilot engaged or disengaged.

13) The flightcrew must have successfully completed training for Auto Flight Guidance System (AFGS) operations at the MUHs.

14) Understanding the limitations of navigational systems used for approach operations (e.g., Instrument Landing System (ILS) facility performance classification codes and their expected performance found in the Airport Facility Directory (AFD)).

C. Maintenance Program. The certificate holder/operator shall conduct operations in accordance with the airworthiness certification of the autopilot found in 14 CFR part 25, § 25.1329. The certificate holder/operator must also review the established maintenance and reliability program. The design of the program should ensure the equipment functions to the prescribed levels as delivered by the manufacturer, and include maintenance and preventative maintenance. Reference appropriate manuals for compliance with manufacturers' recommendations.

OPSPEC C072—ENGINE-OUT DEPARTURE PROCEDURES WITH APPROVED 10 MINUTE TAKEOFF THRUST TIME LIMITS.

A. General. OpSpec C072 is optional and authorizes the certificate holder to use engine-out departure procedures (DPs) under the provisions of 14 CFR parts 121, 125, and/or 135, as appropriate, using airplanes that are equipped with powerplants that are approved 10-minute takeoff thrust time limits in accordance with the provisions of this guidance and OpSpec C070.

B. Takeoff Obstacle Climb Data in the Aircraft Flight Manual (AFM). The manufacturer's AFM must include takeoff obstacle climb data for use with a 10-minute, engine-out takeoff thrust time limit. This AFM data must be applied to the certificate holder's airplane engine-out takeoff obstacle analysis to provide critical obstacle clearance in the event of an engine failure during takeoff.

1) The FAA Transport Airplane Directorate and the Engine and Propeller Directorate have developed a procedure to certify and revise airplane manufacturers' AFMs to include takeoff obstacle climb data for use with a 10-minute, engine-out takeoff thrust time limit.

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2) Previously, airplane operators' AFM takeoff data only provided data for a 5-minute takeoff thrust time limit. Airplane operators may obtain revised AFMs from airplane manufacturers for specific airplane/engine combinations. This AFM data may then be applied to the airplane operator's engine-out takeoff obstacle analysis to provide critical obstacle clearance in the event of an engine failure during takeoff.

C. Airplane Thrust Limit Restrictions. Because it is assumed that not all airplanes operated by an air carrier will have their AFMs revised for 10-minute takeoff thrust data, some operators' airplane takeoff thrust limits may be restricted to 5 minutes, while other airplanes in the same fleet may have the 10-minute restriction. Certain criteria must be addressed to inform the pilot which limit is applicable in the event of an engine failure during takeoff.

D. Engine-Out DPs. The certificate holder's approved operations manual and training program must include the engine-out DPs specifically designed to use the 10-minute takeoff thrust time limits. These DPs require that airplane operator's training programs, manuals, and procedures address the following areas:

1) Air carrier performance engineers' evaluation of engine-out DPs specifically designed to use the 10-minute takeoff thrust time limit.

2) An FAA AFM revision outlining operational procedures with specific airplane/engine lists that involve the 10-minute takeoff thrust time limit.

3) An FAA-approved dispatch or similar acceptable system that provides specific 10–minute, engine-out takeoff thrust departure procedure information to the pilot for the impending flight concerning the airport, aircraft weight, and departure path.

4) Information readily available to the pilot that indicates airplanes authorized for 10-minute takeoff thrust operations in the event of an engine failure on takeoff.

5) Pilot knowledge of the designed engine-out departure procedure that uses the 10-minute takeoff thrust time limit.

6) Pilot training of the 10-minute takeoff thrust time limit departure flight procedure.

OPSPEC/MSPEC/LOA C073—VERTICAL NAVIGATION (VNAV) INSTRUMENT APPROACH PROCEDURES (IAP) USING MINIMUM DESCENT ALTITUDE (MDA) AS A DECISION ALTITUDE (DA)/DECISION HEIGHT (DH).

A. Applicability. OpSpec/MSpec/LOA C073 is applicable to all certificate holders/operators/program managers conducting airplane operations under 14 CFR parts 91, 91 subpart K (part 91K), 121, 125 (including part 125 Letter of Deviation Authority (LODA) holders), and 135. OpSpec/MSpec/LOA C073 will be used in conjunction with OpSpec/MSpec/LOA C052 (not applicable to part 91 operators). OpSpec/MSpec/LOA C073, in accordance with part 91, § 91.175, which states "unless otherwise authorized by the FAA," authorizes certificate holders/operators/program managers to use a minimum descent altitude (MDA) as a decision altitude (DA)/decision height (DH) using vertical navigation (VNAV).

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B. VNAV Operating Concept. The VNAV operating concept is to fly approach procedures using VNAV guidance with a defined Vertical Path (VPATH) that provides a continuous descent final approach (CDFA). All 14 CFR part 97 Nonprecision Approach (NPA) straight-in IAPs may be flown using an MDA as a DA/DH.

NOTE: The use of MDA as a DA/DH does not ensure obstacle clearance from the MDA to the landing runway. Operators must see and avoid obstacles between the MDA and the runway when § 91.175 requirements are met and the approach is continued below the MDA for landing.

C. Airplane Type and Area Navigation (RNAV) System. OpSpec/MSpec/LOA C073, Table 1 will list the airplane type by make, model, and series (M/M/S) and the RNAV system by model and version.

1) The installed navigation equipment with VNAV must be certified and documented in accordance with FAA Advisory Circular (AC) 20-129, Airworthiness Approval of Vertical Navigation (VNAV) Systems for use in the U.S. National Airspace System (NAS) and Alaska, or AC 20-138 (revision A and later), Airworthiness Approval of Positioning and Navigation Systems. The types of certification include: type certificate (TC), amended TC, Supplemental Type Certificate (STC), and amended STC. An FAA equivalent approval may also include a Service Bulletin (SB) installation with approved data by the air carrier. The following are accepted ways to determine certification:

a) A statement in the FAA-approved Airplane Flight Manual (AFM) showing that the aircraft is equipped with a VNAV system certified in accordance with AC 20-129 or AC 20-138 (revision A and later).

NOTE: AC 20-129 applies only to barometric vertical navigation (baro-VNAV), while AC 20-138A applies only to Satellite-based Augmentation Systems (SBAS) and Ground-Based Augmentation Systems (GBAS). AC 20-129 was cancelled when guidance information for baro-VNAV, SBAS, and GBAS was combined into AC 20-138B and later versions.

b) An Aircraft Evaluation Group (AEG) verification that the applicant’s aircraft and flight management system (FMS) meets AC 20-129 or AC 20-138 (revision A or later) criteria for VNAV operations. This may replace the requirement for an FAA-approved AFM statement or an applicable Flight Standardization Board (FSB) report.

2) The certificate holder/operator/program manager is required to provide documentation proving that airworthiness maintenance practices and procedures are being accomplished.

3) The certificate holder/operator/program manager must review and revise the minimum equipment list (MEL), as necessary, to address any pertinent VNAV or FMS operating requirements.

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D. Public Vertically Guided IAP Assessment. Obstacle clearance surface (OCS) assessments protect the instrument procedure, including the missed approach. Glidepath Qualification Surface (GQS) assessments protect the landing area and are accomplished on part 97 IAPs with a published DA/DH. These approaches conform to the U.S. standard for Terminal Instrument Procedures (TERPS) and include instrument landing system (ILS), Ground Based Augmentation System (GBAS) Landing System (GLS), RNAV (Required Navigation Performance (RNP)), and RNAV Global Positioning System (GPS)) IAP with a localizer performance with vertical guidance (LPV) DA and/or lateral navigation (LNAV)/VNAV DA.

E. Visual Approach Slope Indicator (VASI)/Precision Approach Path Indicator (PAPI) Requirements. VASI/PAPI lighting systems are normally set at a descent angle of 3.0 degrees or with the electronic ILS glideslope (GS), if applicable. Variances to the normal requirements are issued by a Notice to Airmen (NOTAM) and permanently published in the Airport/Facility Directory. A note in the profile view will state if the VASI/PAPI descent angle is not coincident with the published VDA or GS. VASI/PAPI is referenced as Visual Glide Slope Indicator (VGSI) in the C073 template and subparagraph F3).

F. Authorized Approaches. The certificate holder/operator/program manager may fly all part 97 nonprecision straight-in IAPs listed as authorized in their OpSpec/MSpec/LOA C052, Table 1, columns 1 and 2 (C052 not applicable to part 91 operators), using an MDA as a DA/DH if the approach meets one of the following requirements and its subcomponents:

1) Serves a runway that has a published RNAV IAP ("RNAV (GPS)," "RNAV (RNP)," or "GPS" in the title) with a published LNAV/VNAV or RNP DA, and:

a) Has the exact published final approach course as the RNAV IAP.

b) Has a published VDA coincident with or higher than the the barometric vertical guidance GS on the published RNAV IAP.

NOTE: A published VDA is not required when using the LNAV minima line on an RNAV approach that has a published LPV or LNAV/VNAV DA. Use the published GS. The VNAV path must be at or above all stepdown fixes.

c) Is selected from an approved and current database and the FMS displays a final approach Flight Path Angle (FPA) in tenths or hundredths. The displayed FPA may have a maximum difference of minus .04 from the IAP VDA or GS. The displayed FPA may always be rounded up to the next tenth. The range for a given FPA will be 2.9 to 3.0, 3.1 to 3.2, 3.2 to 3.3, 4.0 to 4.1, etc. See examples below.

1. For FMS FPAs displayed in tenths, 3.1 may be displayed for a published IAP with a VDA or GS of 3.10 to 3.14. An FPA of 3.2 may be displayed for a published IAP with a VDA of 3.10 to 3.20.

2. For FMS FPAs displayed in hundredths, 3.10 may be displayed if the FMS FPA does not match the published IAP with a VDA or GS of 3.10 to 3.14. An FPA of 3.20 may be displayed for a published IAP with a VDA of 3.10 to 3.20.

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NOTE: Aircraft without an FMS FPA display meeting previous AC 20-129 criteria may have been approved for LNAV/VNAV approaches using baro-VNAV. Certificate holders/operators/program managers currently approved C073, using AC 20-129 criteria, may continue C073 operations.

2) Serves a runway that has a published ILS, GLS, or RNAV IAP with LPV minima and:

a) Has the exact published final approach course as the ILS, GLS, or RNAV IAP.

b) Has a published VDA or GS coincident with or higher than the GS on the published ILS, GLS, or RNAV IAP.

1. A published VDA is not required on a LOC-only approach when the ILS GS is out of service. Use the published GS. VNAV path must be at or above all stepdown fixes.

2. A published VDA is not required when using the LNAV minima line on an RNAV approach that has a published LPV or LNAV/VNAV DA. Use the published GS. VNAV path must be at or above all stepdown fixes.

c) Is selected from an approved and current database and the FMS displays a FPA in tenths or hundredths. The displayed FPA may have a maximum difference of minus .04 from the IAP VDA or GS. The displayed FPA may always be rounded up to the next tenth. The range for a given FPA will be 2.9 to 3.0, 3.1 to 3.2, 3.2 to 3.3, 4.0 to 4.1, etc. See examples below.

1. For FMS FPAs displayed in tenths, 3.1 may be displayed for a published IAP with a VDA or GS of 3.10 to 3.14. An FPA of 3.2 may be displayed for a published IAP with a VDA or GS of 3.10 to 3.20.

2. For FMS FPAs displayed in hundredths, 3.10 may be displayed if the FMS FPA does not match the published IAP with a VDA or GS of 3.10 to 3.14. An FPA of 3.20 may be displayed for a published IAP with a VDA of 3.10 to 3.20.

NOTE: Aircraft without an FMS FPA display meeting previous AC 20-129 criteria may have been approved for LNAV/VNAV approaches using baro-VNAV. Certificate holders/operators/program managers currently approved C073, using AC 20-129 criteria, may continue C073 operations.

3) Serves a runway to an airport operating under 14 CFR part 139 with a VGSI.

a) The VDA or GS on the published final approach course must be coincident with or higher than the published VGSI descent angle.

b) The published final approach course is within plus or minus 4 degrees of the runway centerline (RCL) course.

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G. Approach Design Requirements. The IAP must conform to the following procedural design:

1) Be published with a VDA or GS found in the profile view.

2) Have a VNAV path angle greater than 2.75 and less than 3.77 degrees for Category A, B, and C aircraft, and a VNAV path angle greater than 2.75 and less than 3.50 degrees for Category D/E aircraft.

3) Steeper descent paths may be authorized in accordance with the current edition of AC 120-29. Submit aircraft capability and supporting procedures to the Flight Technologies and Procedures Division (AFS-400) via the principal operations inspector (POI).

H. Database. Waypoint and procedure data must be retrievable from an approved and current database. Source data or database providers must provide for the specification of a VPATH that ensures operation above stepdown fixes between the threshold and the final approach fix (FAF).

NOTE: The procedure must be loaded from the database and cannot be modified.

I. Operational Considerations. The certificate holder/operator/program manager will comply with the following operational conditions:

1) They will follow the lateral flightpath to the missed approach point (MAP) before beginning any turns, unless air traffic control (ATC) has provided alternate climb-out instructions when executing a missed approach before the MAP. He or she will comply with published altitude restrictions between the FAF and the MAP and continue on or climb to the altitude specified in the missed approach procedure. He or she will ensure that the altitude at the published MAP is equal to or greater than the published MDA.

2) They will not use an MDA as a DA/DH if the requirements specified in this guidance are not met. The certificate holder/operator/program manager may use a CDFA, but will begin the missed approach at an altitude above the MDA that will not allow the aircraft to descend below the MDA.

J. Flightcrew Training. Flightcrews must be trained in accordance with the certificate holder/operator/program manager's OpSpec/MSpec/LOA C052. Part 91 operators must be proficient with VNAV and the IAP to be flown.

OPSPEC C075—CAT I IFR LANDING MINIMUMS—CIRCLING APPROACHES.

A. General. OpSpec C075 is issued to operators who conduct 14 CFR part 121, 125, and 135 operations with fixed-wing airplanes. OpSpec C075 specifies the lowest minimums that can be used for Category (CAT) I circling approach maneuvers. It also provides special limitations and provisions for instrument approach procedures (IAP) at foreign airports. See Volume 4, Chapter 2 for more information on required training for circling maneuvers.

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B. Circle-to-Land Maneuver. For the purpose of this OpSpec authorization, any operator issued this paragraph is authorized to conduct circle-to-land maneuvers. In any weather condition, a certificate holder that permits its pilots to accept a "circle to land" or a "circle to runway (runway number)" clearance from air traffic control (ATC) conducts circle-to-land maneuvers. The term "circle-to-land maneuver" includes the maneuver that is referenced in various regulations, publications, and documents as "circle to land maneuver," "circling," "circling maneuver," "circle," "circling approach," and "circling approach maneuver." With regard to pilots, "conducting" a circle-to-land maneuver means to act as the Pilot Flying (PF) when a circle-to-land maneuver is being conducted.

C. Operations Under IFR During Circle-to-Land. Aircraft operating under instrument flight rules (IFR) during all circle-to-land maneuvers are required to remain clear of clouds. If visual reference to the airport is lost while conducting a circle-to-land maneuver, the missed approach procedure specified for the applicable instrument approach must be followed, unless an alternate missed approach procedure is specified by ATC.

D. Documenting Maneuver Descriptions and Procedures. Each certificate holder who is issued OpSpec C075, and who is also required to have maneuver descriptions/procedures, must publish in its training manual, or must incorporate in its training manual by reference to another approved manual, a detailed description of the procedures used to conduct a circle to land maneuver. Pilots must conduct circle-to-land maneuvers using those procedures.

E. Provisions for Part 121 Certificate Holders to Perform Circle-to-Land Maneuvers. Part 121 certificate holders may conduct circle-to-land maneuvers under two separate provisions within OpSpec C075.

1) Part 121 Operations with Flight Training and Flight Checking. Part 121 certificate holders whose pilots have been trained and checked for the circling maneuver in accordance with part 121 appendices E and F, or in accordance with an Advanced Qualification Program (AQP), may conduct a circle-to-land maneuver:

- At the published circling landing minimums for the instrument approach to be used; or
- At the minimums specified in the chart contained within the OpSpec paragraph, whichever is higher.

a) Appendix E does not require a part 121 certificate holder to train a second in command (SIC) in the circling maneuver if the certificate holder prohibits the SIC from performing/conducting (acting as PF) a circling maneuver. However, an SIC must be trained and can be checked in those functions specific to the circle-to-land maneuver that the SIC is required to perform while acting as pilot-not-flying (PNF).

b) Any pilot who possesses a pilot certificate restricting circling approaches to visual meteorological conditions (VMC) is not eligible to conduct circle-to-land maneuvers, except as provided in subparagraph E.

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2) Part 121 Operations Without Flight Training and Flight Checking. Certificate holders conducting circle-to-land maneuvers without training and checking must use a minimum descent altitude (MDA) of 1,000 feet height above airport (HAA) or the MDA of the published circling landing minimums for the instrument approach to be used, whichever is higher. Certificate holders that conduct a circle-to-land maneuver under this provision remain under an IFR clearance and must comply with those procedures otherwise required for circle-to-land maneuvers. Certificate holders must ensure that pilots are familiar with those procedures. Part 121 pilots who have not been trained and checked for the circling maneuver in accordance with part 121 appendices E and F, or in accordance with an AQP, may conduct a circle-to-land maneuver when:

- The reported ceiling is at least 1,000 feet and the visibility is at least 3 statute miles (see part 121 appendices E and F); or
- The reported weather is at least equal to the published circling landing minimums for the instrument approach to be used, whichever is higher.

F. Circle-to-Land Maneuvers Regarding Part 125. Part 125 certificate holders are not permitted to conduct circle-to-land maneuvers in airplanes without their pilots having been checked in that maneuver.

1) Part 125, § 125.291(b) States: "The IAP or procedures must include at least one straight in approach, one circling approach, and one missed approach. Each type of approach procedure demonstrated must be conducted to published minimums for that procedure."

2) Required Part 125 SIC. The SIC must complete the annual competency check required by § 125.287. The circle-to-land maneuver is not part of the § 125.287 competency check. However, each SIC is evaluated for flightcrew coordination.

3) PNF Duties. Each crewmember can be checked in those functions specific to the circle-to-land maneuver that the pilot is required to perform while acting as PNF.

G. Circle-to-Land Maneuvers Regarding Part 135. Part 135 certificate holders are not permitted to conduct circle-to-land maneuvers in aircraft without their pilots having been checked in that maneuver. (Helicopter IFR circle-to-land maneuvers are authorized in OpSpec H118.)

1) Part 135, § 135.297.

a) Section 135.297(a) does not allow "any person to serve, as pilot in command of an aircraft under IFR unless, since the beginning of the 6th calendar month before that service, that pilot has passed an instrument proficiency check under this section…."

b) Section 135.297(b) requires, "The IAP or procedures must include at least one straight in approach, one circling approach, and one missed approach. Each type of approach procedure demonstrated must be conducted to published minimums for that procedure." The requirement to demonstrate a circle-to-land maneuver applies to both airplanes and helicopters.

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c) Part 135 single-pilot and single pilot-in-command (PIC) operators are not required to have training programs. However, the circle-to-land maneuver must be successfully demonstrated in every § 135.297 instrument proficiency check (IPC).

2) In accordance with § 135.293, a part 135 IFR operator must ensure that each IFR SIC has an annual competency check. In accordance with Volume 3, Chapter 19, Section 7, paragraph 3-1279, an SIC need not be evaluated in "circling approaches" when an operator's procedures restrict an SIC from conducting (acting as PF) this event in revenue service. However, each required IFR SIC is evaluated for flightcrew coordination.

3) PNF duties. Each pilot must be trained and can be checked in those functions specific to the circle-to-land maneuver that the pilot is required to perform while acting as PNF.

4) The standard of competence for part 135 IPCs is specified in § 135.293(d). This standard is also specified in the Airline Transport Pilot and Aircraft Type Rating Practical Test Standards for Airplane (FAA S-8081-5) and the Instrument Rating Practical Test Standards for Airplane Helicopter Powered Lift (FAA S-8081-4).

H. Helicopter Authorization. For helicopter authorization, see OpSpec H118.

OPSPEC/MSPEC C076—CAT I IFR LANDING MINIMUMS—CONTACT APPROACHES. The certificate holder must not use any instrument flight rules (IFR) Category (CAT) I landing minimum lower than that prescribed by the applicable published instrument approach procedures (IAP). The IFR landing minimums prescribed in paragraph C052 for nonprecision and precision approaches are the lowest CAT I minimums authorized for use at any airport. For helicopter authorization, see OpSpec H119.

OPSPEC C077—TERMINAL FLIGHT RULES LIMITATIONS AND PROVISIONS.

A. OpSpec C077. OpSpec C077 is an optional authorization that is applicable to all operators conducting operations under the provisions for 14 CFR part 135 on-demand turbojet, all 14 CFR part 121 certificate holders, and 14 CFR part 129 foreign air carriers (except for rotorcraft operations). Information on C077 for part 129 foreign air carriers is contained in Volume 12, Chapter 2, Section 5 of this handbook. Information regarding C077 contained in this section applies only to certificate holders conducting part 121 and part 135 operations.

B. Charted Visual Flight Procedure (CVFP). OpSpec C077 provides for operations under a CVFP unless operating under the provisions of 14 CFR part 93, Special Federal Aviation Regulation (SFAR) 50-2. The minimums in the CVFP may not be lower than those required by part 121, § 121.649 or part 135, § 135.205, as applicable.

C. Visual Flight Rules (VFR) Weather Condition Minimums. The VFR weather conditions specified in part 91, § 91.155 may be used. However, where § 91.155(c) and (d) refers to § 91.157, the minimums set forth in § 121.649 or § 135.205, as applicable, take precedence for operations conducted under part 121 or 135.

D. Subparagraph c.(2)(b). Uncontrolled airports can be in either controlled or uncontrolled airspace. As long as the provisions listed in this subparagraph are met, the operator

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may operate VFR in uncontrolled airspace in the terminal area in accordance with this OpSpec. For the purpose of direct communication at uncontrolled airports, a common traffic advisory frequency (CTAF) may be utilized as long as it is associated with an air/ground communication facility. The CTAF may be an Aeronautical Advisory Station (UNICOM), Aeronautical Multicom System (MULTICOM), Flight Service Station (FSS), or a tower frequency. Acceptable air/ground communication is a demonstrated reliable means to directly relay traffic advisories (TA) and information that is pertinent to conditions on and around the landing surface during the terminal phase of flight. For example, if the certificate holder adequately demonstrates to the principal operations inspector (POI) its reliability to relay essential information, via radio or another type of communication, through an agent located near the landing surface, it is considered to be a "demonstrated reliable means" of communication.

E. Subparagraph c.(3). In lieu of a published CVFP, an authorized visual guidance procedure such as the use of RNAV Visual Flight Procedures (RVFP) is highly recommended for all terminal VFR departures/arrivals that fall under this OpSpec. The proximity of obstacles to the departure flightpath, the visibility, the accuracy of the guidance and control systems, the pilot's proficiency, and the operator's training should determine the size of the area in which obstacle clearance or avoidance must be considered. The POI should also take into account the airplane performance data described in Volume 4, Chapter 3 of this handbook.

F. Terminal Departures VFR. At airports that do not have an operating air traffic control (ATC) facility, subparagraph d. of C077 allows a flightcrew on an instrument flight route (IFR) flight to take off and depart under VFR without obtaining an IFR clearance, provided all of the conditions and limitations of C077 subparagraph d.(1) through d.(4) are met. The flightcrew must obtain an IFR clearance as soon as it is practical after takeoff, but under no circumstances farther than 50 nautical miles (NM) from the departure airport. In the case where a certificate holder is issued OpSpec B051 for VFR en route operations in conjunction with C077, the flightcrew may apply the provisions B051, where applicable, in lieu of obtaining an IFR clearance.

G. Terminal Departure IFR Requirements in Subparagraph e. This subparagraph allows the flightcrew to accept an IFR clearance that contains a takeoff and climb in VFR conditions to a specified point in the clearance. The certificate holder must ensure that the obstacle performance requirements are met.

H. Special Limitations and Provisions for All VFR Operations. C077 subparagraph f. provides special limitations and provisions for all VFR operations. This subparagraph is applicable to all the provisions and limitations of C077.

1) Subparagraph f.(1). In order for the certificate holder or operator to conduct terminal VFR operations under C077, they must have in place either a procedure or program which can identify obstacles and the airport obstacle data. Further, they must ensure use of that information by the flightcrew.

2) Subparagraph f.(2). Although each subparagraph has specific details and minimums regarding VFR, the requirements for sufficient visibility to identify and avoid obstacles is required for all VFR operations.

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OPSPEC C078/C079—IFR LOWER-THAN-STANDARD TAKEOFF MINIMA, 14 CFR PART 121 AIRPLANE OPERATIONS—ALL AIRPORTS.

A. General. C078 and C079 are optional for authorizing lower-than-standard takeoff minimums. The authority for lower-than-standard takeoff minimums is contained in 14 CFR part 91, § 91.1039(e); 14 CFR part 121, § 121.651(a)(1); 14 CFR part 125, § 125.381(a)(1); and 14 CFR part 135, § 135.225(g) and (h). When appropriate, principal operations inspectors (POI) will issue OpSpec C078 to part 121 or 125 operators, LOA C078 to part 125M operators, OpSpec C079 to part 135 operators, and MSpec C079 to part 91 subpart K (part 91K) operators. These authorizations contain specific criteria regarding pilots, training and qualifications, aircraft, and airports when lower-than-standard takeoff minimums are used.

NOTE: C078 and C079 are applicable to all airports utilized by the operator.

NOTE: There may be additional limitations and guidance for specific airplanes in Flight Standardization Board (FSB) reports, which are binding upon all parts 121 and 135 operators.

NOTE: For the purpose of this OpSpec/MSpec/LOA, the word “sensor” is used to indicate all approved Runway Visual Range (RVR) systems.

B. Lower-Than-Standard Takeoff Minimums for Part 121 or 125. C078 allows for lower-than-standard takeoff minimums for operators conducting operations under part 121 or 125 (including Letter of Deviation Authority (LODA) holders operating under part 125) with the following limitations and provisions:

1) Takeoff operations without runway centerline (RCL) lighting are not allowed at less than RVR 1000 (300 meters),

2) Takeoff operations using only visual references are not allowed at less than RVR 500 (150 meters),

3) Takeoff operations with visibility down to, but not lower than, RVR 300 (75 meters) using approved Head-Up Display (HUD) takeoff guidance systems,

4) Authorization for pilot assessment of touchdown zone (TDZ) RVR for takeoff when the installed RVR sensor is inoperative (see subparagraph H), and

5) Lower-than-standard takeoff minimums include paragraphs addressing takeoffs down to RVR 1600 (500 meters), RVR 1200 (350 meters), RVR 1000 (300 meters), RVR 600 (175 meters), and RVR 500 (150 meters).

C. Lower-Than-Standard Takeoff Minimums for Part 91K or 135. C079 allows for lower-than-standard takeoff minimums for operators conducting operations under parts 91K and 135 with the following limitations and provisions:

1) Lower-than-standard takeoff minimums down to RVR 1600 (500 meters), RVR 1200 (350 meters), RVR 1000 (300 meters), or RVR 500 (150 meters) for part 135

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domestic operations. Section 135.225(f) restricts part 135 domestic operators to 1-mile visibility for takeoffs at foreign or military airports unless approved in the certificate holder's OpSpecs.

2) Lower-than-standard takeoff minimums down to RVR 1600 (500 meters), RVR 1200 (350 meters), RVR 1000 (300 meters), or RVR 600 (175 meters) for part 91K operations at all airports.

3) Each aircraft must be operated with a flightcrew consisting of at least two pilots. Use of an autopilot in lieu of a required second in command (SIC) is prohibited.

4) There are some circumstances in which an Operations inspector for a part 121 or 135 air carrier may consider issuing this OpSpec for airplanes certificated under Civil Air Regulations (CAR) 3 or 14 CFR part 23. Those airplanes have to meet the 14 CFR part 25 avionics equipment requirements necessary to hold a C079 authorization. The following statement becomes binding on such aircraft and must be added using the "Remarks" paragraph selection for C079 to be issued:

a) Each pilot station must have operational equipment that displays a reliable indication of the following:

1. Aircraft pitch and bank information (attitude) (from a gyroscopic or attitude heading reference system source);

2. Aircraft heading (from a gyroscopic or magnetic direction indicating source);

3. Vertical Speed (VS);

4. Airspeed; and

5. Altitude.

b) Each pilot station must have an independent source of power for the equipment required by subparagraph C4)a)*1* and C4)a)*2*.

5) Each pilot in command (PIC) must have at least 100 hours of flight time as PIC in the specific make and model airplane used under this authorization. Each PIC must have satisfactorily completed the operator's approved training program (as applicable) and a qualification check for the minimums approved by this authorization. This includes the methods to be used to ensure compliance with the aircraft performance limitations during takeoffs with RVR less than RVR 1000 (300 meters), when applicable.

6) Any part 91K or 135 SIC authorized to manipulate the flight controls during lower-than-standard takeoff minimums must have at least 100 hours of flight time as a pilot in the specific make and model airplane, and must have satisfactorily completed the operator's approved training program and qualifications check for those minimums, when applicable.

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7) For takeoffs when the RVR is less than RVR 1000 (300 meters), each airplane used must be operated at a takeoff weight that permits the airplane to achieve the performance equivalent to the takeoff performance specified in § 135.367 (for reciprocating-powered airplanes), § 135.379 (for turbine-powered airplanes), or § 135.398 (for commuter category airplanes).

D. Lower-Than-Standard Takeoff Minimums Using HUD Systems. C078 and C079 provide for the authorization of lower-than-standard takeoff minimums using HUD systems with certain limitations and provisions. Although RVR 500 (150 meters) is the lowest authorized minimum when the takeoff is based upon outside visual references (with the exception of operations conducted under part 91K and operations to foreign or military airports conducted under part 135), RVR 300 (75 meters) is the lowest authorized minimum when using an HUD system on a runway that has been determined to be served by a localizer providing Category (CAT) III rollout guidance, as indicated by a III/E/4 facility classification. As the HUD systems use the localizer signal for steering commands, the localizer needs to be III/E/4 certified (III=CAT III, E=accurate to at least 2,000 feet from the departure end of the runway, and 4=4,000 hours mean time between failures for the localizer signal). A listing of runways with III/E/4 localizer classifications is available on the Flight Operations Branch (AFS-410) Web site at http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs400/afs410.

E. Lower-Than-Standard Takeoff Minimums for TDZ RVR. C078 and C079 authorize lower-than-standard takeoff minimums for TDZ RVR 1600 (500 meters). If TDZ RVR is inoperative, mid-point RVR may substitute for TDZ RVR. Below RVR 1600, two operating RVR sensors are required and controlling. If more than two RVR sensors are installed, all operating RVR sensors are controlling, with the exception of a fourth, far-end RVR sensor that may be installed on extremely long runways. A far-end RVR sensor is advisory only. C078 and C079 allow the selection of the following lower-than-standard takeoff minimums based on flightcrew training, checking, and allowed authorizations:

1) TDZ RVR 1200 (350 meters), mid-point (if installed) RVR 1200 (350 meters), and rollout RVR 1000 (300 meters).

2) TDZ, mid-point (if installed), and rollout RVR 1000 (300 meters).

3) TDZ, mid-point (if installed), and rollout RVR 600 (175 meters) (part 91K).

4) TDZ, mid-point (if installed), and rollout RVR 500 (150 meters) (part 121, 125, or 135). Part 91K program managers are limited by regulation to RVR 600 (175 meters) takeoff authorization without an exemption. The RVR 500 (150 meters) and RVR 300 (75 meters) authorization will not be available in the part 91K MSpec C079. Tables 3-24A, Runway Equipment Requirements for Lower-Than-Standard Takeoff Minimums, and 3-26A, Runway Equipment Requirements for Lower-Than-Standard Takeoff Minimums, provide examples of tables that may be included in flightcrew manuals, such as the Flight Operations Manual (FOM).

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Table 3-24A. Runway Equipment Requirements for Lower-Than-Standard Takeoff Minimums

Serviceable Runway Visual Aid Required	Lowest Allowable Takeoff Minimum Authorization
If an RVR sensor is not available:	
Adequate visual reference, *or* any *one* of the following: HIRL/CLL/RCLM	1/4 sm (400 m)
If an RVR sensor is available:	Note: Below RVR 1600, two operating RVR sensors are required. All operating RVR sensors are controlling (except per the note below for far-end sensors).
Adequate visual reference, *or* any *one* of the following: HIRL/CLL/RCLM	RVR 1600 (500 m)/NR/NR Mid-point can substitute for an unavailable touchdown.
Day: CLL or RCLM or HIRL Night: CLL or HIRL	RVR 1200 (350 m)/1200 (350 m)/1000 (300 m)
RCLM and HIRL, or CLL	RVR 1000/1000/1000 (300 m)
HIRL and CLL	RVR 600/600/600 (175 m) or RVR 500/500/500 (150 m)
With an approved HUD takeoff guidance system, HIRL, and CLL	RVR 300/300/300 (75 m)

NOTE: Extremely long runways (e.g., DEN 16R) utilize four RVR sensors (i.e., TDZ, mid, rollout, and far-end). When a fourth far-end RVR value is reported, it is not controlling and is not to be used as one of the two required operative RVR sensors.

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Table 3-26A. Runway Equipment Requirements for Lower-Than-Standard Takeoff Minimums

Runways with 1 RVR Sensor		
RCLM or CLL or HIRL or Adequate Visual Reference	Standard	
TDZ RVR 16 or 1/4	3 & 4 Eng	1 & 2 Eng
	RVR 24 or 1/2	RVR 50 or 1

Runways with 2 RVR Sensors						
Both RVR sensors are required and controlling.				RCLM or CLL or HIRL or Adequate Visual Reference	Standard	
HUD & CLL & HIRL	CLL & HIRL	CLL, or RCLM & HIRL	RCLM (day only) or CLL or HIRL			
TDZ RVR 3 Rollout RVR 3	TDZ RVR 5 Rollout RVR 5	TDZ RVR 10 Rollout RVR 10	TDZ RVR 12 Rollout RVR 10	TDZ RVR 16 or 1/4	3 & 4 Eng	1 & 2 Eng
					RVR 24 or 1/2	RVR 50 or 1

Runways with 3 RVR Sensors						
Two operating RVR sensors are required. All operating RVR sensors are controlling.				RCLM or CLL or HIRL or Adequate Visual Reference	Standard	
HUD & CLL & HIRL	CLL & HIRL	CLL, or RCLM & HIRL	RCLM (day only) or CLL or HIRL			
TDZ RVR 3 Mid RVR 3 Rollout RVR 3	TDZ RVR 5 Mid RVR 5 Rollout RVR 5	TDZ RVR 10 Mid RVR 10 Rollout RVR 10	TDZ RVR 12 Mid RVR 12 Rollout RVR 10	TDZ RVR 16 (if TDZ inop) Mid RVR 16 or 1/4	3 & 4 Eng	1 & 2 Eng
					RVR 24 or 1/2	RVR 50 or 1

Runways with 4 RVR Sensors						
Two RVR sensors below must be operational. All operating RVR sensors are controlling except far end, which is advisory only.				RCLM or CLL or HIRL or Adequate Visual Reference	Standard	
HUD & CLL & HIRL	CLL & HIRL	CLL, or RCLM & HIRL	RCLM (day only) or CLL or HIRL			
TDZ RVR 3 Mid RVR 3 Rollout RVR 3	TDZ RVR 5 Mid RVR 5 Rollout RVR 5	TDZ RVR 10 Mid RVR 10 Rollout RVR 10	TDZ RVR 12 Mid RVR 12 Rollout RVR 10	TDZ RVR 16 (if TDZ inop) Mid RVR 16 or 1/4	3 & 4 Eng	1 & 2 Eng
					RVR 24 or 1/2	RVR 50 or 1

F. RVR Applicability to Lower-Than-Standard Takeoff Minimums.

1) Other than the authorization for RVR 1600 (500 meters), which permits use of Runway Visibility Values (RVV) under the appropriate authorization for an operator issued C078 or C079, all the authorizations in C078 and C079 are based on RVR reports that are generated by RVR sensors.

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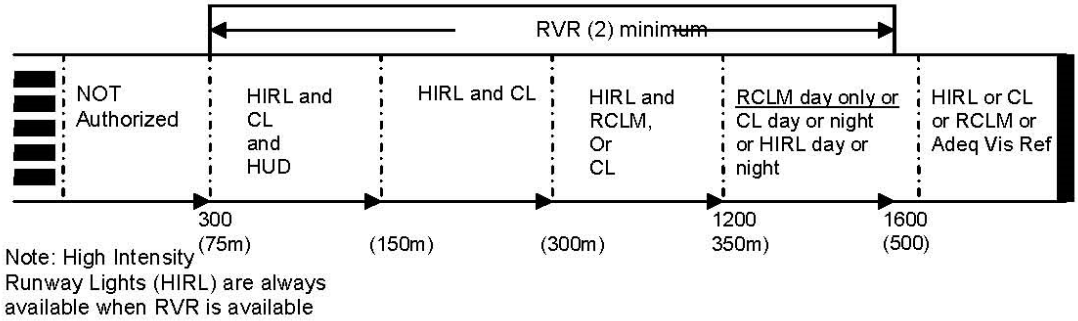
a) "Controlling" RVR means that RVR reports are used to determine operating minimums whenever operating minimums are specified in terms of RVR, and that RVR reports are available for the runway being used.

b) All CAT I operating minimums below one-half statute mile (RVR 2400) and all CAT II and III operating minimums are based on RVR. The use of visibility is prohibited because the reported visibility may not represent the seeing-conditions on the runway. (See Volume 4, Chapter 2, Section 3, paragraphs 4-208 and 4-213.)

c) All takeoff minimums below 1/4 statue mile visibility require RVR values, and the use of RVV for takeoff clearances is prohibited. In these situations, RVR is said to be "controlling"; that is, RVR must be operating and reporting (by requirement, High Intensity Runway Lights (HIRL) also must be working) and at a value equal to or greater than the lowest authorized RVR for the particular clearance. Takeoffs or approaches and landings in these conditions require actual RVR values to be authorized by the controlling agency.

C078 Lower Than Standard Takeoff Visibility Quick Reference Chart



NOTE: The diagram above is intended as a memory aid intended to help in remembering the various RVR breakdowns and associated requirements within each grouping. For example, two RVR sensors are required for all takeoffs at RVR values less than 1600 (500 meters) (shown above the runway).

2) The following requirements and restrictions apply to the use of RVR values below 1600 feet (500 meters) (in the C078 and C079 templates, simplified wording is used):

a) Where only two RVR sensors are installed, the TDZ and rollout RVR sensors are both required and controlling.

b) Where three RVR sensors are installed on the runway to be used:

1. The TDZ, mid, and rollout RVR reports are controlling for all operations.

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2. The failure of any one RVR will not affect operations provided the remaining two RVR sensors are reporting values at or above the appropriate minimums in this subparagraph.

NOTE: Extremely long runways (e.g., DEN 16R) utilize four RVR sensors (e.g., TDZ, mid, rollout, and far-end). When a fourth far-end RVR value is reported, it is not controlling and is not to be used as one of the two required operative RVR systems.

G. Flightcrew Training and Qualification Requirements. If an operator requests authorization to conduct lower-than-standard takeoffs, the flightcrew must be trained and qualified in their respective crew positions for the applicable takeoff minimums requested. The PIC is ultimately responsible for ensuring that the flightcrew members are appropriately qualified before conducting an authorized lower-than-standard takeoff.

1) Individual pilots must be trained in their respective crew positions (parts 91K, 121, and 135) and checked (parts 91K, 121, 125, and 135) in takeoffs using the appropriate requested minimums before being approved for conducting such takeoffs.

2) Pilot qualification must consist of an initial check that includes one takeoff at the lowest requested takeoff minimums (simulator or simulated in the aircraft with a view limiting device). It is also required during each pilot's recurrent qualification cycle.

3) Additional crew qualification for a check airman or a qualified FAA inspector, beyond that shown herein for regular flightcrews, is not required.

4) POIs must ensure that operators requesting lower-than-standard takeoff minimums provide appropriate training for flightcrews, including the procedures listed below, as appropriate:

- Confirming the takeoff runway alignment (Safety Alert for Operators (SAFO) 07003 includes guidance and/or advisory information about acceptable techniques);
- Rejected takeoffs in a low-visibility environment;
- Low-visibility instrument takeoff cross-check priorities;
- Engine failure during critical phases of takeoff in low visibility;
- Acceleration and climb disorientation factors and illusions;
- Use of HUD takeoff guidance systems (when installed in aircraft for RVR 300 authorization only);
- Taxiing in a low visibility environment with emphasis on preventing runway incursion, and Surface Movement Guidance and Control System (SMGCS) training Advisory Circular (AC) 120-57, Surface Movement Guidance and Control System, current edition, includes guidance and/or advisory information about acceptable techniques;
- Taxiway critical areas;
- Crew coordination and planning;

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- Required ground-based visual aids (such as stop bars and taxi holding position lights);
- Required ground-based electronic aids (such as instrument landing system (ILS) and transmissometers); and
- Determination of takeoff alternate airports.

H. Pilot Assessment of Instrument Flight Rules (IFR) Lower-Than-Standard Takeoff Minimums. C078 and C079 allow pilots to make an assessment of the touchdown RVR when the TDZ RVR sensor is inoperative, is not reported, or the pilot determines that the reported TDZ RVR report is in error. This assessment, when equal to or greater than the TDZ RVR requirement for takeoffs made with only outside visual references, or for takeoffs using HUD systems, can be used for takeoff when mid and rollout RVR sensors are available, and are equal to or greater than the required minimums. To be authorized for this pilot assessment, each operator must meet the following requirements:

1) For each specific runway for which the assessment is allowed, have an FAA-approved procedure for assessing RVR values that includes:

a) Identification of actual distances between runway lights (from 160 feet to 200 feet) on the particular runway for the takeoff in question.

b) Identification of an appropriate number and type of runway lights that matches the particular RVR minimums or required visual distance for the takeoff being made.

c) Identification of runway markings of known spacing with corresponding distances that must be visible to the pilot from the flight deck when the aircraft is in the takeoff position.

2) This procedure must include the effects of variability of runway light intensity settings and changing ambient lighting (day or night). Flightcrew training and checking must assess knowledge of this specific subject area by requiring crews to relate runway markings and number of lights visible to specific known distances.

3) For each type of runway where an assessment is allowed, have an FAA-approved procedure for describing the actions to be taken when local visibility conditions, as determined by the pilot, indicate that a significantly different visibility exists from that reported for the TDZ recorded by RVR sensor. The procedure will address types of runway markings, runway lights and distances between lights, and any other runway environmental cues that permit precise distance evaluations by flightcrews.

4) For each runway where an assessment is allowed, have an FAA-approved procedure for coordinating release with air traffic control (ATC) and dispatch for part 121 operations.

5) For part 135 air carriers, the operator must have an FAA-approved procedure for conducting pilot assessment of takeoff visibility contained in its manual, as defined by § 135.21. That procedure will cover the following requirements:

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a) How to determine actual visibility measured in number and type of runway lights that are seen, or markings of known spacing that are visible to the pilot when viewed from the cockpit in the takeoff position.

b) How all flightcrew members will be trained and checked in the procedures used to determine visibilities, as described above.

6) Have FAA-approved procedures for RVR assessment, for determining that TDZ RVR sensor reports are in error, and for takeoff and flight release coordination in operating manuals and in such materials that are readily available to the flightcrew in the cockpit.

7) Have an FAA-approved training and validation program of the FAA-approved procedures for all flightcrews authorized to participate. No flightcrew member may participate in these operations until this portion of the approved training program is accomplished satisfactorily.

OPSPEC C080—TERMINAL AREA IFR OPERATIONS IN CLASS G AIRSPACE AND AT AIRPORTS WITHOUT AN OPERATING CONTROL TOWER FOR SCHEDULED PASSENGER OPERATIONS. C080 is used to authorize terminal-area instrument flight rules (IFR) operations for scheduled passenger operations in Class G airspace or at airports without an operating control tower.

A. Authorizing Scheduled Terminal-Area IFR Operations in Class G Airspace. Before authorizing scheduled terminal-area IFR operations in Class G airspace, or at airports without an operating control tower, the principal operations inspector (POI) must ensure the operator has sufficient content in its manual(s) and training program to cover common traffic advisory frequency (CTAF) and pilot controlled lighting (PCL) information and procedures. The POI must also obtain and list the following information in C080.

1) Names of airports.

2) Sources of weather information to be used by flightcrews (see Volume 3, Chapter 26, Section 3; and Volume 3, Chapter 2).

3) Source of traffic advisories (TA) and airport advisories.

B. Sources of TAs and Airport Advisories. Certificate holders may be authorized to use any two-way radio source of air TA information listed in the Aeronautical Information Manual (AIM) (for operations in U.S. airspace) or equivalent Aeronautical Information Publication (AIP) (for foreign operations).

1) These sources include CTAFs, Aeronautical Advisory Stations (UNICOM), Aeronautical Multicom Stations (MULTICOM), and Flight Service Stations (FSS).

2) If an air TA source is also suitable for determining the status of airport services and facilities, it is the only source which needs to be listed in C080.

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3) When airport services and facilities information is on a different frequency, both sources should be listed in C080.

4) In cases where two sources are listed at the same airport, inspectors must ensure the operator's manuals have procedures that require pilots to continuously monitor and use the TA frequency when operating within 10 nautical miles (NM) of the airport. The procedures should require communication concerning airport services and facilities to be completed while more than 10 NM from the airport.

5) At some airports, no public use frequencies may be available. In those cases, a certificate holder must arrange for radio communication of essential information including surveillance of local or transient aircraft operations by ground personnel. Ground personnel, who operate a company radio for airport status and traffic advisory, must be able to view airspace around the airport.

6) OpSpec C080 may need to be issued to the certificate holder authorized scheduled passenger operations in order for the C081 to be issued.

C. Part 125 Operators. C080 is not applicable for part 125 operators.

OPSPEC/MSPEC/LOA C081—SPECIAL INSTRUMENT AND RNAV VISUAL FLIGHT PROCEDURES.

A. Applicability. Operations specification (OpSpec)/management specification (MSpec)/letter of authorization (LOA) C081 authorizes special non-Title 14 Code of Federal Regulations (14 CFR) part 97 instrument approach procedures (IAP) and departure procedures (DP). It also authorizes the use of special Standard Terminal Arrivals (STAR) and Area Navigation (RNAV) Visual Flight Procedure (RVFP) operations. C081 applies to all certificate holders/operators/program managers conducting airplane operations under 14 CFR parts 91 (including part 91K), 121, 121/135, 125 (including 125 Letter of Deviation Authority (LODA) holders), and 135. For part 129 foreign air carriers, the guidance for OpSpec LOA C381 is in Volume 12, Chapter 2, Section 5.

B. Helicopter Authorization. Guidance for submitting and processing "special" helicopter instrument procedures will use this guidance. Use OpSpec/LOA H122 to issue a "special" to parts 91, 91K, 121/135, and 135 operators.

C. Responsibilities. AFS-400 provides policy, oversees approved procedure developers, and approves special instrument procedures and RVFPs that are authorized for specific certificate holders/program managers/operators by their principal operations inspector (POI). The regional Flight Standards division (RFSD) NextGen Branch (RNGB/AXX-220) is the field focal point that assists in the design, distribution, and coordination of special instrument procedures and RVFPs within their regional geographic boundaries. POIs authorize the use of approved special instrument procedures and/or RVFPs via OpSpec/MSpec/LOA as appropriate.

D. Program Tracking and Reporting Subsystem (PTRS) Activity Codes.

1) PTRS Activity Codes—Initial Issuance.

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- Special Authorization: 1404.
- Approval of Special Navigation Procedures: 1410.
- Special Performance Authorizations: 1441.

2) PTRS Activity Codes—Future Actions or Surveillance.

- Surveillance Operator Facility: 1635.
- Surveillance Miscellaneous Executive Corporate Operator: 1682.
- Surveillance Miscellaneous 14 CFR Part 125 Deviation Holder: 1683.

E. Background. Instrument Flight Procedures (IFP) not published in the Federal Register (FR) are identified as "special procedures." Any instrument procedure serving a private use, permission required airport/heliport must be a special procedure. Special procedures may also be developed to lower approach and/or departure minimums. Aircraft equipment/avionics, performance standards, and/or crew training may be used to mitigate factors that would require higher minimums. Specials may also require the use of landing aids, communications, or weather services not available for public use. For more information, see the current edition of Federal Aviation Administration (FAA) Order 8260.60, Special Instrument Procedures.

F. Development of a New Special or RVFP. See Order 8260.60 for developing special instrument procedures and Order 8260.55, Special Area Navigation Visual Flight Procedures (current edition) for information on developing RVFPs.

1) Specials are typically developed and/or maintained by either an FAA-approved third party or by the FAA via a reimbursable agreement. The cost of the reimbursable agreement may be waived or reduced if the special is determined to be in the public's interest. Development and approval will take 12 to 24 months or more in most cases.

2) RVFPs are developed by the operator with oversight by the FAA Flight Standards Service (AFS).

NOTE: A list of approved specials and RVFPs is available at https://nfdc.faa.gov/xwiki/bin/view/NFDC/Flight+Procedures.

G. Authorize an Approved Special or RVFP. The operator requesting the procedure must submit a written request, via the POI, to the RNGB in the region responsible for the physical landing area. This request does not require a memo from the POI. The RNGB will then provide the POI with the appropriate information. For example, to authorize a special approach procedure into Aspen, CO, contact the RNGB (in this case ANM-220) to get the required information.

1) FAA 8260 Forms. The RNGB will email the POI the appropriate 8260 forms for each procedure. The RNGB will include a form that defines the procedure for charting purposes and a form that describes any applicable operator requirements (if required). These forms are:

a) For new approaches, FAA Form 8260-7A, Special Instrument Approach Procedure, defines the procedure and FAA Form 8260-7B, Special Instrument Procedure

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Authorization, defines the operator requirements, with FAA Form 8260-7B requiring POI and operator signatures.

b) For older approaches, FAA Form 8260-7 defines the procedure and FAA Form 8260-10, Standard Instrument Approach Procedure (Continuation), defines the operator requirements, with FAA Form 8260-7, Special Instrument Approach Procedure, requiring POI and operator signatures.

c) For departures, FAA Form 8260-15A/B/C, Takeoff Minimums and Obstacle Departure Procedures (ODP)/Graphic Departure Procedure (DP)/Departure (Data Record), defines the procedure and FAA Form 8260-7B defines the operator requirements, with FAA Form 8260-7B requiring POI and operator signatures.

NOTE: Department of Defense (DOD) requests for specials will be managed by the RNGB in the region responsible for the special or RVFP (with AFS-400 coordination, if necessary). The RNGB may supply the DOD with appropriate forms. RNGB should maintain records and contact information so any revisions or possible cancellation of the special may be disseminated to the DOD point of contact (POC).

2) Form Review and Distribution. The POI will provide the 8260 forms to the operator.

a) POIs will review the operator's existing procedures, documentation, equipment, manuals, and training to ensure any requirements specific to the procedure and listed on the FAA Form 8260 are satisfactorily addressed. These requirements may require special aircraft performance, equipment, avionics/software, and/or crew training. If existing operator procedures do not address all requirements, the operator must submit a plan to the POI with the necessary changes needed to comply with the requirements of the special procedure. This plan must address any aircraft specific requirements for each make/model/series (M/M/S) that they plan to use to fly the special. Once the implementation plan is accepted, the operator may receive the applicable signed forms needed to continue the process. Contact the Aircraft Evaluation Group (AEG) for aircraft specific questions and the RNGB for technical questions about special procedures and requirements. Ensure that the OpSpec/MSpec/LOA authorization includes an entry in the last column of Table 1 listing only the aircraft approved to fly the procedure(s). This ensures that any new aircraft added at a future date are not inadvertently authorized without conducting the appropriate review. If the 8260 forms or the RNGB require a demonstration flight, see subparagraph 5) below.

b) POIs and the operator's representative will sign FAA Form 8260-7B after the POI has discussed the procedure requirements with the operator and the operator has provided the POI with documentation showing compliance with procedure requirements (i.e., aircraft performance, aircraft equipment, crew qualifications, etc.) or an implementation plan that shows a reasonable expectation that they will be able to safely meet all procedural requirements. If required, the RNGB may issue their concurrence by email or, upon request, a memo. The POI will give a signed copy to the operator and maintain a signed copy in the office file. RNGBs may individually determine if they will require a copy of the signed forms to be maintained in their

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files. The POI will notify the RNGB via email when appropriate forms are signed and forward those forms, if requested by the RNGB. These forms allow the operator to receive customized charts and navigation database coding (if applicable) from chart vendors and also training from most contract training vendors. It may take some time for the operator to fully implement their plan and qualify all relevant personnel to conduct the procedure(s). The OpSpec/MSpec/LOA must not be authorized until the operator has implemented their plan and is fully prepared to fly the procedure.

NOTE: Signing the back of FAA Form 8260-7B or 8260-7 is not the formal issuance of the authority for use of a special procedure. That is conveyed by the issuance of OpSpec/MSpec/LOA C081, H122, or LOA C381.

c) If applicable, the principal maintenance inspector (PMI) and principal avionics inspector (PAI) should review the requirements contained in the procedure and affirm for the record (such as a PTRS record of review) that the aircraft type(s) in question can perform the procedure. Some special instrument procedures require nonstandard/higher missed approach climb gradients and specific qualities or levels of avionics.

3) Training. A certificate holder/program manager's training program must include training on the procedure and equipment required to accomplish the procedure. An operator/company must be proficient on the procedure and the equipment required to accomplish the procedure. All FAA Form 8260-7B and 8260-10 training requirements must be met for all procedures. Training for specific procedures may be required if the performance, equipment, services, terrain effects, or a combination of factors is emphasized to ensure a safe operation. However, if the operator is seeking authorization for multiple specials or RVFPs, training for each specific procedure may not be required if the training is duplicative, the multiple specials are basic instrument approaches to a private use landing area, and no additional performance or training requirements for a specific airfield are noted on forms.

NOTE: For questions about training at 14 CFR part 142 training centers, contact the Training Center Program Manager (TCPM). AFS-200 is responsible for part 142 training center policy and guidance.

4) Charts. The RNGB will send the POI the 8260 forms described above. These forms will be used by the operator to get a chart produced. The operator will submit a copy of the completed chart to the POI. Upon receipt, the POI will forward a copy of the chart to the RNGB for distribution in accordance with Order 8260.60. The Flight Standards District Office (FSDO)/certificate management office (CMO) must not authorize operational implementation of the procedure until the chart is received by the RNGB. In some cases, a third party developer will create a chart for the operator and submit it to the RNGB for distribution. The RNGB will distribute this chart to the POI who, in turn, will give it to the operator.

5) Demonstration Flights. The 8260 forms may require a demonstration flight, or the POI and the RNGB may require a demonstration flight, at their discretion, to verify the suitability of the operator's aircraft, equipment, procedures, and profiles as described in the subparagraphs below.

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a) Special Pilot Qualification Airports—Part 121. Part 121 air carriers are required to perform an in-flight demonstration of a new special IFP at a special pilot qualification airport. If an existing special IFP is amended, a demonstration flight may be required at the discretion of the POI and the RNGB based on the changes to the procedure. OpSpec C050 is used to authorize part 121 air carrier certificate holders to conduct instrument flight rule (IFR) operations into special airports requiring special airport qualification and validation in accordance with the provisions and limitations of the OpSpec and part 121, § 121.445. The list of special pilot qualification airports can be found at http://fsims.faa.gov/PICResults.aspx?mode=Publication&doctype=OPSS Guidance.

b) Other Airports—Parts 91, 91K, 121, 125, 129, and 135. If the airport served is not a special pilot qualification airport and a demonstration flight is not stipulated on FAA Form 8260-7B, a demonstration flight may still be required at the discretion of the POI and RNGB before an operator can use a new or amended special IFP. Flight simulator and tabletop reviews are other ways to confirm an operation can be conducted safely. The POI and RNGB should consider the operator's experience at that airport, profiles and procedures, aircraft capabilities, deviation from IFP criteria, and local environmental considerations (terrain, radar and communications coverage, obstacles, etc.) when determining if a flight demonstration, simulator, or tabletop review is required.

c) Requirements. If the POI and the RNGB require a demonstration flight, they must dictate the requirements and criteria for satisfactorily completing the demonstration. The POI may issue a provisional authorization allowing an operator to conduct a special IFP if an FAA Operations inspector is observing the flight to evaluate that procedure during routine operations in visual meteorological conditions (VMC). The provisional authorization should only be used after a careful evaluation has been made of the special IFP for safety-related factors. Issue this provisional authorization by adding the special IAP to the appropriate OpSpec/MSpec/LOA (C081, H122, or LOA C381) with the provision that the authorization is only applicable to flights observed by an FAA Operations inspector in VMC.

6) Authorization. POIs will issue the approved procedure via OpSpec/MSpec/LOA C081 (H122 for helicopter operations) as described below, once the operator has implemented their plan to address all of FAA Form 8260 requirements (including training, dispatch, equipment, performance, etc.), has submitted a chart to the POI (and the POI has forwarded that chart to the RNGB), satisfactorily completed the demonstration flight (if required), and the RNGB concurs with the authorization (if required). Enter the aircraft M/M/S in the "Airplane (Rotorcraft) M/M/S" column of Table 1 if the authorization requires specific aircraft performance, equipment, or avionics capability. Only the specific M/M/S that has been reviewed and found suitable may be entered in the table. The POI must review the specific FAA Form 8260-7B requirements (and obtain concurrence from the RNGB, if necessary) before authorizing any additional aircraft M/M/S and/or any aircraft that has modified its avionics package.

NOTE: The issuing authority for "special procedures" remains with the FAA. An operator who has been issued authority to use a special procedure will not authorize other operators to use the procedure. If additional users wish to be

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authorized, they must apply to use the procedure through their POIs and the appropriate RNGB.

a) The RNGB will notify POIs of all approved operators when a special or RVFP is amended or canceled. This notification will typically include an effective date when the old procedure is canceled (if applicable), and an effective date when the new procedure is active. Procedure effective dates can be critical to flight safety. Procedures must not be used after the expired effective date. For example, some procedure amendments use the same fix names but with the fixes in a slightly different location, and those fix locations will change on the effective date, allowing the use of the expiring procedure until the effective date and the new procedure on and after the effective date. If the procedure has a specific effective date set by the RNGB, add a reference to that effective date in the "Airplane (Rotorcraft) M/M/S" column of Table 1 for the new procedure as well as the expiring procedure (if applicable).

b) For new, amended, or canceled specials or RVFPs, the POI will issue the OpSpec/MSpec/LOA revision in accordance with this subparagraph within 30 days of RNGB notification or by the effective date, whichever is later. If the POI/Operator cannot meet this deadline the POI must, at a minimum, remove the expiring procedure from the operator's authorization by the effective date canceling that special or RVFP. To ensure that operators are using the correct, current procedure, the POI will enter the procedure amendment number (ORIG, 1, 2, etc.) as part of the procedure name in the second column of Table 1. POIs may also want to add a reference to that effective date in the "Limitations and Provisions" column of Table 1 for the new procedure. POIs will reference the cancellation date of the expiring procedure in the "Limitations and Provisions" column of Table 1 or remove the authorization for the expiring procedure (if applicable)

c) RNGB. The RNGB has the authority to rescind their concurrence with an operator authorization if the operator deviates from the procedure requirements, the RNGB becomes aware of any additional operational/training requirements, or any other factors that affect the safe operation of the procedure become known. The POI must rescind authorization for use of a procedure immediately upon notification from the RNGB in accordance with 14 CFR part 119, § 119.51.

H. Table 1 Instructions. When authorizing a special or RVFP, enter the airport identifier (ICAO), city, airport name, state, full procedure name, airport state, airplane M/M/S and any limitations and/or provisions in Table 1 as shown in the example below (Table 3-26B, Sample OpSpec/MSpec/LOA C081/H122 Table 1). The Web-based Operations Safety System (WebOPSS) does not provide drop-down fields for the instrument procedures to be listed in OpSpec/MSpec/LOA C081 or H122.

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Table 3-26B. Sample OpSpec/MSpec/LOA C081/H122 Table 1

Airport Identifier (ICAO)	Procedure Name, ORIG or AMDT #	Airport State	Airplane (Rotorcraft) M/M/S	Limitations and Provisions
KJFK; New York/John F. Kennedy Intl, NY	RNAV (RNP) RWY 13R, AMDT 2	NY	B-737-800	
KJFK; New York/John F. Kennedy Intl, NY	RNAV Visual RWY 13R, AMDT 2	NY	All B-767 All B-757	
KRNO; Reno/Reno/Tahoe Intl, NV	ILS/DME RWY 16R, AMDT 3	NV	All A-319 All B-757	
99OI, Fostoria Community Hospital, Fostoria, OH	Copter RNAV (GPS) 10, ORIG-B	OH	EC-130-T2 BHT-412-EP	Authorized on and after April 4, 2013
KEGE, Eagle County Regional Airport, Eagle, CO	ILS or LOC/DME RWY 25, ORIG	CO	G550 G650	

1) Airport Identifier (ICAO): Select airport using ICAO airport identifier. Field will populate with ICAO Identifier, City, Airport Name, State. Use third column when accomplishing state query.

2) Procedure Name: Use procedure name found on FAA Form 8260-7 or 7B to complete this block in the template. This will aid the WebOPSS query process. These procedures are subject to revision, so ensure that the amendment number (including ORIG for “original”) is included in the procedure name.

3) Airport State: List airport state with two letter identifier. Added to aid WebOPSS query.

4) Airplane M/M/S: List airplanes (rotorcraft) that are approved to fly the special procedure. To authorize a new airplane (rotorcraft) to use a special that is already authorized for an existing airplane (rotorcraft), contact the geographic RNGB for a joint review of the new aircraft’s (rotorcraft’s) capabilities. RNGB concurrence is required to authorize any new airplane (rotorcraft) to fly these procedures.

5) Limitations and Provisions: For procedures that require specific review and evaluation of aircraft performance, equipment/avionics, training, or other criteria that would require that an authorization be limited to a specific airplane (rotorcraft) M/M/S, enter the limitation or provision after the approved M/M/S to ensure that any future airplane (rotorcraft) added by the operator is not authorized by default without completing the same review of the new airplane (rotorcraft) capabilities.

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I. Additional Requirements. The following OpSpec/MSpec/LOAs may be required for the authorization of specific procedures.

1) OpSpec C081 or LOA C381.

a) OpSpec/MSpec/LOA C052, Straight-In Non-Precision, APV and Category I Precision Approach and Landing Minima—All Airports. Parts 91K, 121, 121/135, 125 (including LODA holders), and 135 certificate holders/operators/program managers must be issued C052. The "type" (e.g., RNAV, instrument landing system (ILS), localizer type directional aid (LDA), etc.) of instrument approach listed in C081 in Table 1 must be listed in the table of authorized approaches in C052. RVFP and Required Navigation Performance Authorization Required (RNP AR) procedures will not be listed in C052.

b) OpSpec/MSpec/LOA C063, Area Navigation (RNAV) and Required Navigation Performance (RNP) Terminal Operations. Parts 91K, 121, 121/135, 125 (including LODA holders), and 135 certificate holders/operators/program managers may require a C063 authorization. C063 authorizes RNAV 1, RNP 1 and other Performance Based Navigation (PBN) flight operations and is required for certificate holders/operators/program managers authorized to conduct RNAV 1, RNP 1 or other PBN flight operation in C081.

c) OpSpec/LOA C064, Terminal Area IFR Operations in Class G Airspace and at Airports Without an Operating Control Tower—Nonscheduled Passenger and All Cargo Operations. Parts 121, 121/135, 125 (including LODA holders), and 135 certificate holders may require a C064 authorization. Determine the type of airport and operation being conducted in association with the C081 authorization.

d) OpSpec C077, Terminal Flight Rules Limitations and Provisions. Parts 121, 121/135, and 135 certificate holders may require a C077 authorization. C077 provides arrival and departure guidance for instrument and visual flight operations (e.g., visual flight rule (VFR) departure on an IFR clearance). C077 provides guidance on the use of a charted visual flight procedure (CVFP). Determine if a VFR operation into or out of an airport is part of the C081 authorization.

e) OpSpec C080, Terminal Area IFR Operations in Class G Airspace and at Airports Without an Operating Control Tower for Scheduled Passenger Operations. Parts 121, and 121/135 certificate holders may require a C080 authorization. Determine the type of airport and operation being conducted in association with C081 authorization.

f) OpSpec/MSpec/LOA C384, Required Navigation Performance Procedures with Authorization Required. Parts 91, 91K, 121, 121/135, 125 (including LODA operators), and 135 certificate holders/operators/program managers should be authorized C384, when an RNP AR-like special procedure, normally titled RNAV (RNP), is authorized in C081. Approval to fly an AR-like special without C384 will be granted by AFS-400 and documented on FAA Form 8260-7B. The authorization in C384 must contain the "lowest RNP" and "additional aircraft capabilities" meeting the requirements of the special procedure authorized in C081.

2) Helicopter OpSpec/MSpec/LOA H122.

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a) OpSpec/MSpec/LOA H102, Basic Instrument Approach Procedure Authorizations—All Airports. Parts 91, 91K, 121/135, and 135 certificate holders/operators/program managers must be issued H102. The “type” of approach authorized in H122 must be authorized in H102.

b) OpSpec/MSpec/LOA H112, Instrument Approach Operations Using an Area Navigation System. Parts 91, 91K, 121/135, and 135 certificate holders/operators/program managers may require an H112 authorization.

c) OpSpec/MSpec/LOA H113, Special Terminal Area IFR Rotorcraft Operations in Class G Airspace—Nonscheduled Passenger and All-Cargo Operations. Parts 91, 91K, 121/135, and 135 certificate holders/operators/program managers may require an H113 authorization.

d) OpSpec/MSpec/LOA H121, Special Terminal IFR Rotorcraft Operations in Class G Airspace—Scheduled Passenger Operations. Parts 91, 91K, 121/135, and 135 certificate holders/operators/program managers may require an H121 authorization.

3) Example. Table 2 (Table 3-26C, Sample Table 2—Additional Authorizations) below shows a matrix of airplane and rotorcraft additional authorizations. C052 and H102 are required because they authorize the “type of procedure” requested by C081. The “may be required” authorizations are based on the “type of operation” sought along with the procedure. Authorizations are not permitted for those parts with an NA.

Table 3-26C. Sample Table 2—Additional Authorizations

Airplane						
	C052	C063	C064	C077	C080	C384
91	NA	Optional	NA	NA	NA	*
91K	R	*	NA	NA	NA	*
121	R	*	*	*	*	*
121/135	R	*	*	*	*	*
135	R	*	*	*	*	*
125	R	*	*	NA	NA	*
125 LODA	R	*	*	NA	NA	*
Rotorcraft						
	H102	H112	H113	H121		
91	NA	NA	NA	NA		
91K	R	*	*	NA		
121/135	R	*	*	*		
135	R	*	*	NA		

R – Required * – May be Required NA – Not Applicable

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NOTE: The table in this guidance is a graphical depiction on additional authorizations that are: required, may be required, or not applicable.

J. Amendments. The geographic RNGB will notify the POI of procedure amendments and send the POI all of the new forms required for the amendment. In most cases, this entire process will need to be reviewed to ensure operator compliance with the amended procedure requirements, and the operator will be required to get a new chart, which they must submit to the POI. The POI will forward the new chart to the RNGB for distribution.

K. Cancellations. If an operator is no longer going to use a procedure, the POI must remove the procedure from the operator's OpSpec/MSpec/LOA and advise the appropriate RNGB that the operator is no longer authorized to use that procedure. If the procedure is canceled, the RNGB will notify the POI and the POI will remove the procedure from the operator's OpSpec/MSpec/LOA.

L. Notices to Airmen (NOTAM). Special procedures exist outside of the normal notification system for standard instrument procedures. Many special procedures serve landing areas that are in the public NOTAM system, and public NOTAMs will be issued for specials whenever possible. However, sometimes it is not possible to issue a NOTAM for a special, which requires updates and changes to be issued to all authorized operators through their POI. Therefore, it is critical to record, maintain, and update operator contact data with the appropriate RNGB branch.

M. Adding an Aircraft. If the operator requests to fly an authorized RVFP or special procedure in a new aircraft (e.g., one that they are not currently authorized to fly), the POI should review this entire process to ensure the suitability of the proposed aircraft.

N. Oversight and Auditing. Oversight management and guidance of operator authority and use of special instrument procedures is not currently in the FAA automated work programs. It may occur under the initiative of planned activities by POIs for those certificated operators who are addressed in National Work Programs for inspectors. POIs are requested to review the OpSpec/MSpec/LOA for their assigned operators annually to ensure the currency of the special instrument procedures. Part 91 operators are normally not addressed in the national programs. It is therefore critical that this certification and approval process be tracked directly by the FSDO. The FSDO should maintain files (paper/electronic/etc.) for operators authorized to conduct special procedures and conduct an annual review of the files to ensure that current information is maintained and disseminated.

- The documentary elements of the special instrument procedure (FAA Form 8260 series, a copy of the current chart as issued to the operator, related correspondences, etc.) should be maintained in the FSDO's part 121, 125, 129, or 135 operator files. The FSDO should create and maintain a specific file for parts 91 and 91K operators that are authorized to use special IAPs.
- The RNGB must be supplied with a copy of the current chart and any subsequent updates or changes. At their discretion, the RNGB may require a copy of the signed 8260 forms. The POI should review the status of the special authority annually and advise the RNGB of any changes (i.e., aircraft type, company's

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existence, etc.) The PMI and PAI should apply the same review to any aircraft changes that they did for the initial authority. A record of such review should be kept in the part 121 or 135 file.

- The RNGB will advise POIs of changes or updates to the procedures and distribute such information in accordance with Order 8260.60.

O. Additional Information. LOA C381, Special Instrument Procedures, Regional Authorization, allows FSDO inspectors and the RNGB to authorize multiple part 91 pilots and operators to use special instrument procedures. This LOA is only applicable to part 91 operators, and is not required to be used in lieu of individual LOA C081 authorizations. The geographical RNGB will determine which procedures are applicable for LOA C381. All other special terminal instrument procedures issued to part 91 operators, including those procedures that require additional pilot training or specific equipment and/or aircraft performance requirements, must be authorized using LOA C081 for each operator on a case-by-case basis.

OPSPEC C091—OPERATIONAL REQUIREMENTS AIRPLANE DESIGN GROUP VI (ICAO GROUP F). (OPTIONAL.)

A. Applicability. OpSpec C091 must be issued to U.S. certificate holders who conduct takeoff and landing operations using Airplane Design Group VI (ADG-VI), International Civil Aviation Organization (ICAO) Group F, within or outside the United States on runways as narrow as 150 feet (45 meters) wide.

B. Operational Requirements. OpSpec C091 specifies the runway width, Obstacle Free Zone (OFZ), and other airport requirements for these aircraft. ADG-VI are airplanes with a wingspan from 214 feet (65 meters) up to 262 feet (80 meters). It closely parallels ICAO Group F criteria. However, where the ICAO Code designation is also dependent on main gear track width, the Federal Aviation Administration (FAA) criteria is dependent on the wingspan of the aircraft and tail height. The current edition of Advisory Circular (AC) 150/5300-13, Airport Design, establishes airport requirements for the different airplane design groups, including runway width requirements, taxiway width requirements, OFZ dimensions, and other airport considerations. Historically, the FAA has authorized deviations from these established standards on an air carrier-by-air carrier basis after evaluating the specific air carrier's operational procedures and flightcrew training program and standards. Operational limitations were typically part of the air carrier's operational authorization to operate as per the specific deviation granted to the air carrier.

NOTE: In order to allow ADG-VI aircraft operations on existing infrastructure, U.S. Airplane Design Group V (ADG-V) airports accepting scheduled service of ADG-VI aircraft are required to undergo a special modification of standards (MoS). The MoS applies to those portions of the airport that do not comply with ADG-VI standards.

C. U.S. Certificate Holders and Principal Operations Inspector (POI) Actions. Prior to initiating service to any ADG-V/ICAO Group E airport with an aircraft designed for ADG-VI/ICAO Group F, the certificate holder must supply the POI with the following:

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- Evidence that the requirements of OpSpec C091 are met for the proposed runway(s) of operations at those airports, including potential alternates.
- For destination airports, U.S. airport MoS approval for that make and model (e.g., A-380 or B-747-8).
- For alternate airports, the process the operator used to evaluate the airport to ensure it could accommodate the aircraft.

1) It is the air carrier's responsibility to confirm that they can comply with the requirements of OpSpec C091 and to supply the POI sufficient documentation to verify their compliance. The air carrier is responsible for any necessary coordination and letters of understanding with applicable air traffic control (ATC) facilities and/or airport operators to meet the requirements of OpSpec C091 (e.g., taxi routes to be used and procedures to follow applicable to the specific certificate holder).

2) Flightcrew and dispatch training and qualification program.

3) The POI should provide the air carrier, ATC facility, or airport operator support, as necessary, to comply with the requirements of OpSpec C091. PIs may find a list of airports with MoS, for the A-380 and B-747-8 at http://www.faa.gov/airports/engineering/nla_mos/.

NOTE: The air carrier's compliance with the requirements of OpSpec C091 eliminates the air carrier from having to demonstrate its capability to operate to the lower criteria specified in OpSpec C091 prior to being issued OpSpec C091 for that aircraft and airport combination.

D. ADG-VI/ICAO Group F Aircraft. ADG-VI/Group F specifies that the required runway width be at least 200 feet (60 meters) while ADG-V/Group E specifies that the runway width be at least 150 feet (45 meters). Currently, the A-380 and the B-747-8 are the only commercial aircraft in regular airline service that fit into the ADG-VI/ICAO Group F criteria and are therefore subject to the C091 requirements to takeoff and land on ADG-V/ICAO Group E runways.

E. B-747-8 Limitations. The following limitations apply to B-747-8 operations:

1) Runways for takeoffs and landings shall be at least 150 feet (45 meters) wide;

2) Operators must comply with all limitations and procedures specified in the applicable B-747-8 Airplane Flight Manual (AFM) for lightweight and aft center of gravity (CG) takeoffs.

NOTE: In accordance with FAA Airports Engineering Brief #74A, Use of 150-Foot (45-M) Wide Runways and Blast Pads for Boeing 747-8 Operations, the 35-foot standard stabilized runway shoulder width for ADG-V does not need to increase to the ADG-VI standard of 40 feet.

F. A-380 Limitations. The following limitations apply to A-380 operations:

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1) The overall runway plus shoulder width is of 280 feet (85 meters) for ADG-VI and 250 feet (75 meters) for ICAO Group F. In order to reduce the jet blast impact to 150 feet (45 meters) runway surface, the FAA recommends stabilized shoulders beyond the runway edge. The FAA 150 foot runway width evaluation for the A-380, along with the recommendations for these operations contained in ICAO Annex 14, Aerodromes, and A-380 AFM have led to the following runway width authorization for A-380 operation in the United States:

2) Runways for takeoffs and landings shall be at least 150 feet (45 meters) wide with stabilized runway shoulders on both sides of the runway extending an additional 50 feet (15 meters) outward from the runway edge.

3) Runways as narrow as 150 feet (45 meters) wide without stabilized shoulders may be used for takeoff and landings, provided applicable flight manual procedures for takeoffs on 150 foot wide runways without stabilized runway shoulders are followed and procedures are implemented for the full length of the runway to be inspected for foreign object damage (FOD) after the takeoff prior to successive aircraft operations.

NOTE: Only the airport operator conducts runway inspections for FOD. Hence, the air carrier should make sure, or have some documentation, that the airport operator will do it. The document is the Federally required Airport Certification Manual under 14 CFR part 139.

4) The hold short lines or hold position must be expanded outward from the 280 foot point by 1 foot for every 100 feet the runway threshold elevation is above sea level. (For example, a threshold elevation of 5,000 feet mean sea level (MSL) requires an additional 50 feet. Thus, the hold short lines or hold position can be no closer than 330 feet (280 feet + 50 feet) from the runway centerline (RCL).

NOTE: This is to address the hold position of aircraft when an A-380 is on final approach and is as required per the current edition of AC 150/5300-13. Specifically, so that if the A-380 has to go-around (balked landing) then the lateral area on both sides of the runway is clear of obstacles so that if the A-380 deviates left or right during the go-around maneuver (balked landing) its wing tips will not strike anything.

OPSPEC C300—14 CFR PART 97 NDB, NDB/DME, VOR, AND VOR/DME INSTRUMENT APPROACH PROCEDURES USING SUBSTITUTE MEANS OF NAVIGATION.

A. C300 Nonstandard Authorization. The nonstandard template OpSpec C300 authorizes qualified operators to substitute specific Area Navigation (RNAV) equipment for non-directional radio beacon (NDB), NDB/distance measuring equipment (DME), very high frequency omni-directional range station (VOR), and VOR/DME instrument approaches.

1) The OpSpec/MSpec/LOA C300 authorization covered by this subparagraph applies to operators conducting operations under 14 CFR parts 121 and 135. The airplane's make/model/series, the manufacturer and model, and the software part/version of the RNAV

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navigation systems authorized for this type of navigation must be listed in Table 1 along with any limitations and provisions. (See sample table in Figure 3-66F, Sample Table 1—Aircraft and Navigation Systems Eligible for Instrument Approach Procedures Using Substitute Means of Navigation.)

Figure 3-66F. Sample Table 1—Aircraft and Navigation Systems Eligible for Instrument Approach Procedures Using Substitute Means of Navigation

Aircraft M/M/S	RNAV System(s) and Software			Limitations and Provisions
	Manufacturer	Model	Software Part/Version	
B-717-200	Honeywell	Pegasus	PS4081642-909	NDB, NDB/DME IAP N/A

2) Before a principal operations inspector (POI) can issue a nonstandard OpSpec/MSpec/LOA C300, the Flight Technologies and Procedures Division (AFS-400) and the Air Transportation Division (AFS-200) must concur with the POI's recommendation to issue the OpSpec/MSpec/LOA.

3) The POI must use the request process as illustrated in Figure 3-66G, Instrument Approach Procedures Using Substitute Means of Navigation Application Flowchart, when the operator submits an application package.

a) The POI submits the application package to the regional NextGen program branch manager.

b) The regional NextGen program branch manager forwards the application to AFS-400 for review.

c) AFS-400 will review the application in consultation with AFS-200 and forward a written concurrence to the regional NextGen program branch manager.

d) The regional NextGen program branch manager will forward the written concurrence to the POI.

e) The POI will issue OpSpec/MSpec/LOA C300 to the operator.

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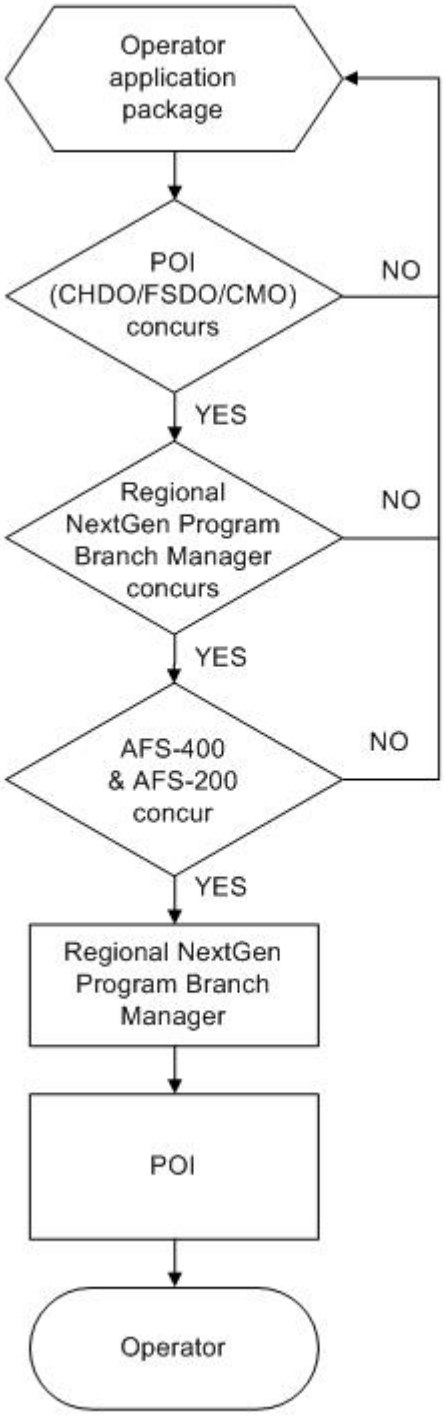
Figure 3-66G. Instrument Approach Procedures Using Substitute Means of Navigation Application Flowchart



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B. Aircraft Qualification. Use the guidelines in OpSpec C300 for aircraft qualification.

C. Operating Considerations. This authorization to conduct NDB, NDB/DME, VOR, and VOR/DME instrument approach procedures (IAP) using substitute means of navigation applies when the underlying Navigational Aid (NAVAID) (NDB, VOR, or DME) is out of service, and/or compatible aircraft avionics are either not installed (automatic direction finder (ADF) or DME) or not operational (VOR, ADF, or DME).

1) Navigation Data and Flyability Validation. The operator must establish a process to ensure that each IAP intended to be flown under this authority has been checked to confirm flyability with aircraft RNAV systems. The structure of this process is left to the operator's discretion as long as compliance with OpSpec C300 is met. The operator's process must also ensure that any lateral path changes that occur during the 28-day update cycle are examined to confirm the flyability of procedures and that the flyability and validation are documented.

2) Dispatching to Airports with Out-of-Service NAVAIDs. Operators planning to dispatch to an airport with an out-of-service NAVAID may need to coordinate with air traffic control (ATC). In order to receive a clearance for certain procedures, this coordination should include, but is not limited to, the operators' intent to use their RNAV system as a substitute means of navigation guidance and their capability and operational authorization.

D. Training. The flightcrew must complete the operator's approved training program, to include training specific to the RNAV manufacturer/model/software and software version, and IAPs using substitute means of navigation. Guidance in OpSpec C300 must be addressed in the training program.

OPSPEC/MSPEC/LOA C358—SPECIAL RESTRICTIONS FOR FOREIGN RNAV TERMINAL INSTRUMENT PROCEDURES WITH RNP LINES OF MINIMUMS.

NOTE: To obtain the nonstandard authorization C358, the operator must use the nonstandard request process. See Volume 3, Chapter 18, Section 2, paragraphs 3-712 to 3-713, for the nonstandard request process. For operators conducting operations under 14 CFR part 121 or 135, the formal request must be requested through the Air Transportation Division (AFS-200). For operators conducting operations under 14 CFR part 125, including part 125 Letter of Deviation Authority (LODA) holders, or under 14 CFR part 91 subpart K (part 91K), the same nonstandard request process must be used and submitted through the General Aviation Division (AFS-800). The airplane qualification package should be sent simultaneously to the Flight Technologies and Procedures Division (AFS-400) for evaluation. AFS-400 will coordinate with the appropriate policy division for final approval of this nonstandard authorization for all operator requests.

A. Nonstandard Authorization. The nonstandard template C358 authorizes a qualified operator to conduct certain "RNP-like" foreign Area Navigation (RNAV) Terminal Instrument Procedures (TERPS) with required navigation procedures (RNP) lines of minimums. These

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"RNP-like" foreign RNAV approaches are not designed to the same criteria as U.S. 14 CFR part 97 RNAV RNP special aircraft and aircrew required (SAAAR) procedures. Only the selectable procedures in Table 1 of the C358 template may be authorized. The International Civil Aviation Organization (ICAO) uses the term Authorization Required (AR) rather than SAAAR. AR may appear on "RNP-like" foreign RNAV procedures with RNP lines of minimums regardless of the design criteria.

NOTE: "RNP-like" foreign RNAV procedures with RNP minimums that meet part 97 RNAV RNP SAAAR procedure design criteria are not available for selection in the C358 template, Table 1, and require authorization via the authorization of template C384.

1) C358 authorization is granted through the nonstandard authorization request process (see Volume 3, Chapter 18, Section 2).

2) C358 authorization is applicable to operators conducting operations under 14 CFR parts 91, 91K, 121, 125 (including those with a LODA 125M), and 135.

3) Procedures with RNP lines of minimums. These "RNP-like" foreign RNAV procedures have RNP lines of minimums of 0.3 or less, and/or a radius to a fix (RF) leg required, and/or the missed approach requiring an RNP less than 1.0. RNP less than 0.3 specified in the line of minimums (RNP line of minimums refers to the minimum altitude for the approach and has an RNP requirement associated with it; e.g., there may be minimums of 250 feet for RNP 0.11 and a separate line of minimum of 350 feet for RNP 0.20).

4) U.S. RNAV RNP SAAAR procedures are authorized (nonstandard template C384) using the guidance in Advisory Circular (AC) 90-101, Approval Guidance for RNP Procedures with SAAAR, current edition. The foreign "RNP-like" RNAV procedures in Table 1 are authorized using the portions of AC 90-101 that apply to the particular RNP procedure design criteria for each approach.

Figure 3-66A. Sample Table 1—Special Restrictions for "RNP-like" Foreign RNAV Terminal Instrument Procedures with RNP Lines of Minimums

(Only those procedures allowed for authorization will be available as selectables in the C358 template.)

Airport	Procedure Identification	Procedure Requirements
QUITO, Ecuador (SEQU-UIO) / RNAV (RNP) Rwy 17 / VNAV path required, RF leg required, RNP 0.15, Missed approach RNP < 1.0		
QUITO, Ecuador (SEQU-UIO) / RNAV (RNP) Rwy 35 / VNAV path required, RF leg required, RNP 0.15, Missed approach RNP < 1.0		

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B. Airplane Qualification. The airplane qualification must meet the guidelines established in AC 90-101, appendix 2, with the following exceptions:

1) Principal operations inspectors (POI) should send the formal nonstandard request to the appropriate headquarters (HQ) division stating that the airplane qualification and operating procedures have been sent to the Flight Technologies and Procedures Division (AFS-400) for evaluation. POIs should simultaneously submit the airplane qualification and operating procedures package to AFS-400, as described in the AC 90-101, appendix 7 checklist.

2) The vertical accuracy requirement as written in AC 90-101, appendix 2, paragraph 2c is not required for this authorization. Vertical guidance in these foreign "RNP-like" procedure(s) is based on barometric vertical navigation (baro-VNAV). Eligible aircraft are those with an Aircraft Flight Manual (AFM) or Aircraft Flight Manual Supplement (AFMS) that explicitly states that the vertical navigation (VNAV) system is approved for approach operations in accordance with the current edition of AC 20-129, Airworthiness Approval of Vertical Navigation (VNAV) Systems for use in the U.S. National Airspace System and Alaska, or those with written documentation (e.g., Flight Standardization Board (FSB) report or other official documentation) verifying eligibility.

3) Airspace Containment (AC 90-101, appendix 2, paragraph 2d). The airspace containment requirement as written in AC 90-101 is not required for this authorization. Airplanes that are qualified to conduct RNAV operations in accordance with applicable directives and which have the proper RNAV capability (e.g., Global Positioning System (GPS), RF leg capability) for the procedure(s) listed may be authorized.

C. Operating Considerations. The operator must establish operating procedures that meet the applicable guidelines of AC 90-101, appendix 4. Operating procedures must incorporate all operational mitigations based on equipment authorization. For example, if RF leg is authorized, an operational mitigation is required if the equipment engages in "track hold" mode when a go-around is selected. (Track hold would not follow the lateral navigation (LNAV) path when a go-around is initiated in or shortly after an RF leg.) Submit the operating procedures package to AFS-400 as described in the AC 90-101 checklist in appendix 7. The operating procedures must meet the guidelines established in AC 90-101, appendix 4, with the following exceptions.

1) Vertical track deviation monitoring limit of 75 feet (AC 90-101, appendix 4, paragraph 3g.). The track deviation monitoring limit of 75 feet vertically, as written in AC 90-101, is not required for this authorization. Eligible airplanes, in accordance with baro-VNAV requirements, must be equipped with and operationally using either a flight director (FD) or autopilot capable of following the Vertical Path (VPATH).

2) Verification of the most current airport altimeter is set prior to the final approach fix (FAF) but no earlier than the initial approach fix (IAF) (AC 90-101, appendix 4, paragraph 3k). The altimeter setting requirement as written in AC 90-101 is not required for this authorization. Although the listed procedure(s) require(s) the current altimeter setting for the airport of intended landing, the flightcrew is not required to verify the setting between the IAF and the FAF. Normal flight deck procedures must meet this requirement.

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D. Training. The flightcrew must complete the operator's approved RNP instrument approach procedure (IAP) training program for these procedures and qualify for RNP instrument approach operations by one of the operator's check airmen/check pilot, as applicable, or by an FAA inspector. The guidance of AC 90-101, appendix 5, must be addressed in the training program.

1) For operators authorized RNP SAAAR instrument approaches for the aircraft equipment listed in Table 2 of the C358 authorization, only the specific differences from RNP SAAAR procedures that apply to the "RNP-like" foreign RNAV instrument procedures listed in Table 1 of the C358 authorization, must be trained.

2) Flightcrew members of operators that are not authorized for RNP SAAAR for the aircraft equipment listed in Table 2 of the C358 authorization, the applicable subjects of AC 90-101, appendix 5 must be trained:

a) Guidance of AC 90-101, appendix 5, must be followed except where a task analysis has shown that the crew knowledge and skills for RNP SAAAR do not apply to the "RNP-like" foreign RNAV instrument procedure(s) authorized in Table 1.

b) Unique RNP approach criteria that apply to the "RNP-like" foreign RNAV instrument procedure(s) authorized in Table 1.

E. Listing Airplanes and Navigation Systems Approved for "RNP-Like" Foreign RNAV TERPS. The airplane(s) and navigation systems approved for "RNP-like" foreign RNAV TERPS with RNP lines of minimums must be listed in Table 2 of the C358 authorization as follows:

1) The approved navigation systems and the specific software version must be listed.

2) The table must identify the authorized use of a coupled autopilot or an FD which is provided as a selectable in the automated Operations Safety System (OPSS) in processing the authorization.

3) The lowest RNP authorized must be listed.

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Figure 3-66B. Sample Table 2—Airplanes and Navigation Systems Eligible for "RNP-like" Foreign RNAV Terminal Instrument Procedures with RNP Lines of Minimums

Airplane M/M/S	Navigation System M/M/Software/ Version	Limitations and Restrictions	Autopilot Coupled or Flight Director Required	Lowest RNP
B-737-490	Smiths FMCS/FMC 2907A4 or 2907C1 with U10.5A.	Not authorized to exceed temperature limits of the approach. Not authorized RNP parallel approach operations (RPA). Not authorized RNP parallel approach runway transitions (RPAT).	Either FD or Autopilot only	RNP-0.15 RNP-0.11

F. Execution of an "RNP-Like" Foreign RNAV Instrument Procedure. Execution of an "RNP-like" foreign RNAV instrument procedure requires the current, local altimeter setting for the airport of intended landing. Remote altimeter settings are not allowed.

G. VNAV Path Requirements. An airplane(s) with an airworthiness approval for baro-VNAV approach operations in accordance with AC 20-129 must be equipped with and operationally use either an FD or autopilot capable of following the VPATH.

H. Approval Requirements. Unlike RNP SAAAR C384 authorization, there is no interim approval required for this nonstandard authorization in C358. The operator must submit the following information on a continuous basis every 30 days to the POI for his or her evaluation of the continuing use of the authorization (AC 90-101, appendix 6, paragraph 1):

1) Total number of the "RNP-like" foreign RNAV approach procedures conducted;

2) Number of satisfactory approaches by aircraft/system (satisfactory if completed as planned without any navigation or guidance system anomalies); and

3) Unsatisfactory approaches must be included in the report and must include, but are not limited to, the following:

a) UNABLE REQ NAV PERF, NAV ACCUR DOWNGRAD, or other RNP messages during any approach;

b) Excessive lateral or vertical deviation;

c) Terrain Awareness and Warning Systems (TAWS) warning;

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d) Autopilot system disconnect;

e) Navigation data errors; and

f) Pilot report of any anomaly.

OPSPEC/MSPEC C359. DECOMMISSIONED.

LOA C381—SPECIAL INSTRUMENT PROCEDURES, REGIONAL AUTHORIZATION.

A. Applicability. Letter of authorization (LOA) C381 allows Flight Standards District Office (FSDO) inspectors and the regional Flight Standards division (RFSD) Regional NextGen Branch (RNGB) to authorize multiple Title 14 of the Code of Federal Regulations (14 CFR) part 91 pilots and operators to use special non-14 CFR part 97 instrument procedures. RNGBs are not required to use LOA C381. The appropriate geographical RNGB will determine which procedures are applicable for LOA C381. LOA C381 should only be used to maintain a list of multiple users (with written authorizations as described below) of special instrument procedures that do not require specific aircraft equipment, performance, pilot training, or any other complex requirements. All other special terminal instrument procedures must be authorized using LOA C081. The RNGB must contact the Technical Programs Branch (AFS-260) to create an operator in WebOPSS and for RNGB digital signature authority. For LOA C381 applicable to 14 CFR part 129 foreign air carriers, see Volume 12, Chapter 2, Section 5.

NOTE: Currently there is no method to authorize a nonpart 129 foreign pilot/operator to fly special instrument procedures or Area Navigation (RNAV) Visual Flight Procedures (RVFP) due to tracking, notification, and coordination requirements.

B. Background. Section 91.175(a) states, “Instrument approaches to civil airports. Unless otherwise authorized by the FAA, when it is necessary to use an instrument approach to a civil airport, each person operating an aircraft must use a standard instrument approach procedure prescribed in part 97 of this chapter for that airport. This paragraph does not apply to United States military aircraft.”

1) A special terminal instrument procedure (approach or departure) serving a private use airport or heliport is not promulgated under part 97, and therefore requires Federal Aviation Administration (FAA) authorization to conduct these procedures in instrument conditions in accordance with § 91.175(a). OpSpec/management specification (MSpec)/LOA C081 normally authorizes special procedures under 14 CFR parts 91, 91K, 121, 125, and 135. OpSpec H122 authorizes 14 CFR parts 91, 91K, 121/135, and 135 helicopter operators. To ensure that all individual users are authorized correctly for these procedures, all pilots/operators need to be authorized via LOAs to support pilot notification when a procedure is amended or canceled. All part 91 users can be authorized via LOA C081 by their appropriate geographic FSDO, but this can create a greatly increased workload requiring a large number of FAA resources and man hours at air parks with dozens to hundreds of users.

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2) LOA C381 was designed specifically to simplify the authorization process while still authorizing all individual users correctly, to address multiple part 91 operators flying one or more procedures. The RNGB authorizes LOA C381 in Web-based Operations Safety System (WebOPSS), and the last page of the LOA is the signature page for the pilot and the FAA inspector, either a FSDO principal operations inspector (POI) or RNGB All Weather Operations (AWO).

NOTE: While LOA C381 allows an RNGB inspector or FSDO inspector to sign FAA Form 8260-7B and LOA C381 signature page, this is primarily for the sake of flexibility. The geographic FSDO has the primary responsibility to authorize pilots via these signature pages, particularly at air parks which may be a substantial distance from the regional FSDO. The RNGB and the geographic FSDO should work together, particularly during site visits where multiple pilots are anticipated for authorization, but LOA C381 must also be flexible enough to allow either an RNGB inspector or a FSDO inspector to authorize a pilot without inspectors from both offices being present. With the concurrence of the geographic FSDO, an RNGB inspector may authorize users if necessary due to scheduling or staffing issues (e.g., if a FSDO inspector cannot be present). In these instances, the RNGB will ensure that the FSDO receives the required paperwork for their records.

3) LOA C381 (including the signature page) and appropriate 8260 series forms (see subparagraph 5) below) serve as the pilot/operator authorization. One or more approaches in the region can be added to Table 1, and each authorized user for each approach can be added to Table 2 and authorized for individual (or multiple) procedures by referencing Table 1. Although a complete LOA C381 is required for the RNGB and the appropriate FSDO to ensure proper pilot authorizations, the LOA issued to the pilot must only contain, at a minimum, the approach authorized in Table 1, the pilot's name and information in Table 2, and the completed signature page. It is not necessary to send a new copy of LOA C381 with a complete list of all approaches and all pilots to every authorized pilot for every LOA C381 revision. An individual pilot needs to be reissued LOA C381 only when there is a change to a procedure that pilot is authorized to fly, or there is a change in that pilot's authorization.

4) There are several special terminal instrument procedures serving private-use, multiple user, general aviation airports (such as air parks) throughout the United States. Many of these procedures have been around for more than 10 years. Previously, FAA Form 8260-7 defined the procedure and was signed off by the Flight Technologies and Procedures Division (AFS-400) to authorize the procedure. FAA Form 8260-7 has since been updated to FAA Form 8260-7A (which defines the procedure) and FAA Form 8260-7B (which defines any additional operator requirements). Several procedures are still defined by an approved FAA Form 8260-7, and will remain this way until the procedure is amended or canceled.

5) To authorize a user via LOA C381, the pilot completes and signs the bottom half of the last page of the LOA C381 and FAA Form 8260-7B, page 2. An FAA inspector, either an AWO or a FSDO inspector, signs the top half and FAA Form 8260-7B, page 2. The FSDO keeps the signed originals, and gives a copy to the pilot and to the RNGB. The pilot copy is their proof of authorization. The RNGB adds the pilot to Table 2 of LOA C381 and reauthorizes LOA C381

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in WebOPSS. The RNGB is responsible for updating and authorizing the LOA C381 in WebOPSS, including adding pilots and procedures to the tables. The LOA C381 issued to the pilot/operator must contain at least the authorized procedure(s) in Table 1, the authorized pilot with applicable information in Table 2, and the signed original signature page. It is not necessary for all procedures in the region to be listed in Table 1, or all pilots authorized to be listed in Table 2, but the applicable procedure(s) and pilot are required.

6) It is important to note that LOA C381 in WebOPSS only serves as blanket authorization and a tracking method, and is signed in WebOPSS by the RNGB AWO. LOA C381 does not have to be reissued to each listed pilot each time a change is made, but it does need to be reauthorized when one or more pilots is added, removed, or amended in the LOA. The only time a pilot needs to be reauthorized is when that pilot is authorized for a new procedure, or when an authorized procedure is amended.

C. Authorization Forms and Records.

1) As it applies to a pilot/operator, the following signed forms serve as their authorization:

a) Series 8260 Forms: FAA Form 8260-7A (FAA Form 8260-7 for older procedures) containing the specifications of the IAP, FAA Form 8260-7B for issuing the instrument procedure, and FAA Form 8260-15A (FAA Form 8260-15B for graphic Obstacle Departure Procedure (ODP) or Standard Instrument Departure (SID)).

b) LOA C381, signed by both the pilot and an FAA inspector, and including the authorized procedure(s) in Table 1 and the authorized pilot in Table 2.

2) The appropriate geographic FSDO relevant to the pilot maintains signed original of the forms listed in subparagraph 1) above, and sends a copy to the appropriate geographic RNGB relevant to the location of the procedure.

3) The appropriate geographic RNGB relevant to the location of the procedure maintains a copy of the signed forms listed in subparagraph 1) above.

D. Authorization Responsibilities. Due to multiple operators using these special instrument procedures, the following measures outlined below are required to ensure regulatory compliance and limit potential risk.

1) For each procedure, the Airport Manager or their designee shall:

a) Maintain a list of pilots authorized for each procedure, including contact information.

b) For a new procedure or a procedure amendment, where it may be beneficial, arrange a meeting or site visit for the appropriate geographical FSDO and RNGB to authorize multiple users, and notify all pilots seeking authorization.

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c) Notify all pilots/operators requesting to fly any special terminal instrument procedure that they must contact either their appropriate geographical FSDO or RNGB in the region responsible for the procedure for authorization.

d) Using FAA Form 8260-7A (or FAA Form 8260-7 for older procedures) and FAA Form 8260-15A/B, have an aeronautical chart produced suitable for cockpit use.

e) Distribute the appropriate special terminal instrument procedure charts only to pilots/operators that are properly authorized by Flight Standards (AFS). This authorization is verified by presenting the signed FAA Form 8260-7B and the signed LOA C381.

2) The RNGB shall:

a) Establish an Executive Operator in WebOpss to authorize LOA C381, which will contain the list of all pilots/operators authorized to conduct the listed procedures.

b) Verify and enter all pilot/operator information in WcbOPSS, and issue LOA C381 to reflect the procedures as listed in Table 1 of the LOA. See Figure 3-67K for an example.

Figure 3-67K. Sample Table 1 – Airports and Special Terminal Instrument Procedures

Ref. No.	Airport Identifier (ICAO)	Special Terminal Instrument Procedures
1	82IS; Landings Condominium Huntley; IL	VOR-A, AMDT 6 Takeoff Minimums and Obstacle Departure Procedure, ORIG
2	LL22; Brookeridge Air Park; Downers Grove, IL	VOR/DME or GPS-A, AMDT 1

c) Prepare a pilot briefing sheet for each special terminal instrument procedure.

d) Forward a copy of the pilot briefing sheet, FAA Forms 8260-7/8260-7A/ 8260-7B/8260-15A/15B, and any other required documentation to the POI for each procedure.

e) With the concurrence of the geographic FSDO in accordance with paragraph 3-714B2), the RNGB will authorize users via the process outlined in subparagraph 3) below, if necessary, due to scheduling or staffing issues (e.g., if a FSDO inspector cannot be present). In these instances, the RNGB will ensure that the FSDO receives the required paperwork for their records.

f) Save either a hard copy or an electronic copy of each signed pilot authorization and signed FAA Form 8260-7B.

3) The FSDO inspector shall:

a) Verify the pilot’s identity and credentials (pilot certificate/instrument rating/aviation medical).

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b) Review FAA Form 8260-7B for required signatures and any associated documents to ensure accuracy.

c) Emphasize to pilots/operators that the special terminal instrument procedures conform to current requirements and that only authorized pilots/operators are permitted to utilize these procedures.

d) Ensure the pilot/operator understands that no additional training is required to conduct these procedures. If additional training is required, that procedure must be authorized via individual OpSpec/MSpec/LOA in accordance with current 8900.1 guidance.

e) Sign an original and make at least two copies of the signed LOA C381 and signed FAA Form 8260-7B and distribute as follows:

1. Original – FSDO.

2. Copy – Pilot/Operator.

3. Copy – RNGB.

NOTE: The pilot/operator is required to have a copy of the applicable FAA Form 8260-7B in order to have an approach chart and ODP issued for their use.

f) Notify the RNGB of any change in assigned POI.

g) Ensure the pilot/operator understands the original issued IAP charts are authorized for their use only. Photocopying this IAP chart is not authorized.

4) The pilot/operator shall:

a) Maintain current point of contact (POC) information with the appropriate Airport Manager.

b) Prior to being issued LOA C381 and FAA Form 8260-7B, present the following documents to the FAA in person:

1. FAA pilot certificate,

2. FAA medical certificate, and

3. U.S. passport or other government issued photo identification.

c) Ensure their signature is on FAA Form 8260-7B.

d) Present the signed FAA Form 8260-7B to the appropriate airport manager in order to obtain special terminal instrument procedure chart(s).

e) Sign the LOA and confirm FSDO and RNGB signatures.

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f) Have LOA in physical possession, or readily accessible, when exercising the privileges of the LOA.

NOTE: Each owner/operator/pilot in command (PIC) is responsible for currency and proficiency of instrument flight rules (IFR) and an airworthy aircraft.

g) Return the LOA and the issued special charts when the LOA is no longer required.

OPSPEC/MSPEC/LOA C384—REQUIRED NAVIGATION PERFORMANCE PROCEDURES WITH AUTHORIZATION REQUIRED.

A. OpSpec/MSpec/LOA C384 Nonstandard Authorization. The nonstandard template C384 authorizes qualified operators to conduct 14 CFR part 97 Area Navigation (RNAV) Required Navigation Performance (RNP) instrument approach procedures (IAP) with Authorization Required (AR). This template also authorizes foreign RNP IAPs with AR.

1) OpSpec/MSpec/LOA C384 authorization covered by this paragraph applies to operators conducting operations under 14 CFR parts 91 (including part 91 subpart K (part 91K)), 121, 121/135, 125 (including Letter of Deviation Authority (LODA) A125 operators), and 135.

2) Complete operational approval guidance material for RNP IAPs with AR is found in the current edition of Advisory Circular (AC) 90-101, Approval Guidance for RNP Procedures with AR. The AC also includes application preparation and processing guidance.

3) Before a principal operations inspector (POI) may issue nonstandard OpSpec/MSpec/LOA C384, the Flight Technologies and Procedures Division (AFS-400) and either the Air Transportation Division (AFS-200) or the General Aviation and Commercial Division (AFS-800), as appropriate, must concur with the POI's recommendation to issue the OpSpec/MSpec/LOA.

4) Figure 3-71, RNP AR Application Flowchart, illustrates the preferred flow for reviewing RNP AR applications within the FAA. Volume 3, Chapter 1, Section 1 describes the recommended general process to be used by Flight Standards Service (AFS) inspectors in the course of evaluating an operator's request for operational approval. Nothing in this C384-specific guidance is intended to contradict the recommended general process.

a) The POI would typically be the first FAA official to receive and review the application. The POI would provide feedback to the operator, as needed, to produce an application that meets the requirements of the current edition of AC 90-101. The POI would then submit his or her recommendation for approval to the regional Next Generation (NextGen) Branch (e.g., AEA-220).

NOTE: Volume 3, Chapter 1, Section 1 instructs the inspector to upload an electronic version of the RNP AR application to the NextGen application tracking SharePoint site associated with his or her region. The inspector should notify the regional All Weather Operations (AWO) specialist (within the NextGen Branch)

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and the Performance Based Flight System Branch (AFS-470) when the application has been uploaded. This will allow the AWO specialist and AFS-470 personnel to concurrently review the application and save time in the overall process. The POI, AWO specialist, and AFS-470 representatives should collaborate on the application review and thereby avoid duplication of effort in resolving any issues with the application.

b) The AWO specialist will review the application and, if necessary, seek additional information or clarification from the operator through the POI. Upon completion of the AWO specialist's review, the regional NextGen Branch manager should forward his or her recommendation, and that of the POI, to AFS-400.

c) AFS-400 will review the application in consultation with AFS-200 or AFS-800, as appropriate. Upon completion of this review, the coordinating offices will jointly provide written concurrence with the POI and AWO specialist recommendations to approve the application. The headquarters (HQ) concurrence memo will be sent to the POI through the regional NextGen Branch manager.

NOTE: If AFS-200, AFS-400, or AFS-800 does not concur with the recommendations to approve the application, they will provide a memo stating the reasons for this position.

d) The POI will issue the OpSpec/MSpec/LOA C384 to the operator in accordance with the limitations and/or provisions stipulated in the HQ concurrence memo. The HQ memo will, at a minimum, stipulate the specific aircraft make, model, and series (M/M/S), the lowest RNP value authorized, the related flight management system (FMS) software version, and whether the operator is authorized to fly radius to a fix (RF) legs and/or approaches requiring less than RNP 1.0 nautical mile (NM) on the Missed Approach Segment (MAS) (i.e., "additional aircraft capabilities").

5) A listing of foreign RNP AR procedures approved for U.S. operators is maintained on the AFS-470 Web site. In addition, each approved foreign RNP AR procedure is added to the C384 template as a selectable item in Table 2. Operators may have any of those approved foreign procedures added to OpSpec/MSpec/LOA C384, Table 2 at the time C384 is issued, or at a later date, by requesting such action of their POI. No additional application process, or HQ approval, is required. The AFS-470 Web site also includes any limitations or restrictions associated with the foreign RNP AR procedures. Should the inspector have any questions regarding the suitability of an operator for any foreign RNP AR approach procedure, he or she should contact AFS-470.

NOTE: The AFS-470 Web site may be found at http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs400/afs470/rnp.

6) If an operator wants a new (i.e., not currently approved) foreign RNP AR approach to be added to the approved list, they must send a separate application package to the POI. That application package must include a letter of request, the applicable state's

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Aeronautical Information Publication (AIP) (in English), and the applicable procedure charts. The POI should forward the package, along with his or her recommendations, to AFS-400 via the regional NextGen Branch. AFS-400 will evaluate the foreign RNP AR procedure and determine whether it is suitable for U.S. operators' use.

NOTE: The response to this specific request will likely be provided via separate means following completion of the procedure review process described in Figure 3-71 and, if approved, would result in the foreign RNP AR procedure being added to the C384 template and the foreign procedures list on the AFS-470 Web site.

B. OpSpec/MSpec/LOA C384 Tables 1 and 2. The POI should complete Table 1 and, if applicable, Table 2 of OpSpec/MSpec/LOA C384 in accordance with the following guidelines.

1) Table 1 should reflect the complete M/M/S of the aircraft qualified for RNP AR operations, as provided in the HQ concurrence memo. Table 1 should also fully identify the navigation system (FMS) make and model, as well as software version(s). The HQ memo will also stipulate this information.

2) Table 1 should list any limitations specifically addressed in the HQ memo, as well as any limitations identified by the POI. Table 1 should indicate the lowest permissible RNP value for both flight director (FD)-only and autopilot operations, as provided in the HQ concurrence memo. The inspector should also select, in Table 1, those additional aircraft capabilities specifically identified in the HQ memo. See Figure 3-66C, Sample Table 1—Aircraft and Navigation Systems Eligible for RNP Procedures with AR, for a sample OpSpec/MSpec/LOA C384, Table 1.

NOTE: The POI must ordinarily obtain HQ concurrence before making changes to the contents of Table 1, unless specifically authorized in the HQ RNP AR concurrence memo. For example, the inspector would need HQ concurrence prior to adding aircraft or amending the FMS software version. Alternatively, the inspector would not need HQ concurrence prior to amending the "lowest RNP" value if the HQ concurrence memo authorized a lower RNP value at the end of a specified period or upon the operator's completion of a number of RNP AR approaches.

3) Table 2 is used to name the specific foreign RNP AR approaches and any associated limitations for which the individual operator is authorized to fly. All foreign RNP AR procedures approved for U.S. operators will be available for selection within the C384 template. The operator should identify for the POI which foreign RNP AR procedures they want listed in Table 2 of their C384. See Figure 3-66D, Sample Table 2—Foreign Approaches Authorized for RNP AR Operations, for a sample OpSpec/MSpec/LOA C384, Table 2.

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Figure 3-66C. Sample Table 1—Aircraft and Navigation Systems Eligible for RNP Procedures with AR

Aircraft M/M/S	Navigation System M/M/Software Version	Limitations	Lowest RNP	Additional Aircraft Capabilities
B-737-700/ 800	GE Aerospace FMC (2), p/n 171497-05-01, U 10.8A	None	With flight director: RNP .15 With autopilot: RNP .11	1) RF legs. 2) Missed approach requiring less than RNP 1.0.

Figure 3-66D. Sample Table 2—Foreign Approaches Authorized for RNP AR Operations

Approach Name/Identifier	Special Limitations
Tegucigalpa, Honduras (MHTG) RNAV RNP 02	Flightcrews must coordinate missed approach holding instructions with ATC prior to commencing the approach.

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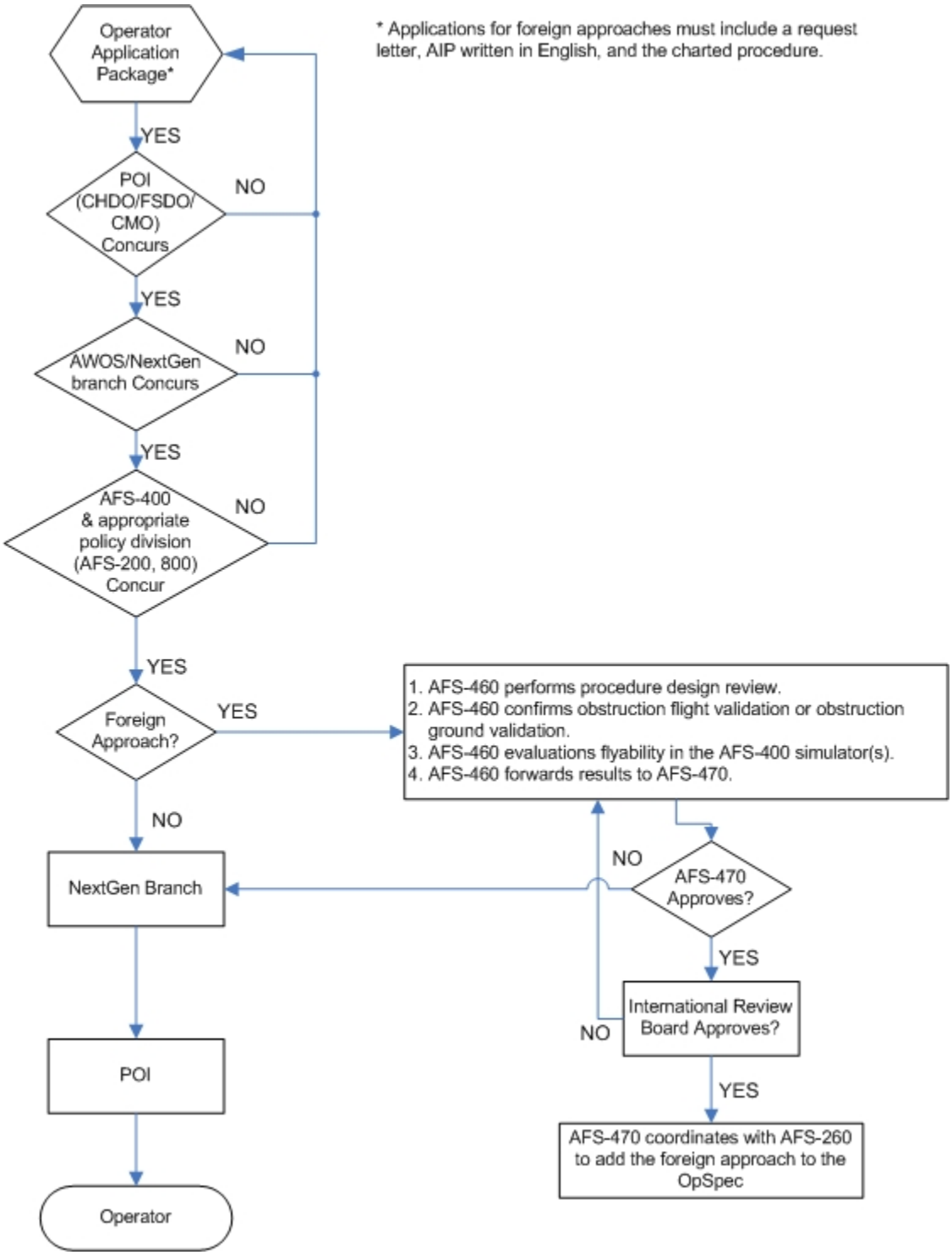
Figure 3-71. RNP AR Application Flowchart



RESERVED. Paragraphs 3-872 through 3-920.

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VOLUME 3 GENERAL TECHNICAL ADMINISTRATION

CHAPTER 19 TRAINING PROGRAMS AND AIRMAN QUALIFICATIONS

Section 6 Flight Training Curriculum Segments

3-1226 GENERAL. This section specifies the objectives of flight training. Both the structure and content of flight training curriculum segments are discussed. Also clarified are the differences between training objectives and qualification objectives. Flight training consists of certain required maneuvers and procedures which are referred to as "training events." The training events, which must be included in flight training curriculum segments to satisfy the requirements of Title 14 of the Code of Federal Regulations (14 CFR) parts 121 and 135, are specified in the maneuvers and procedures tables (see Tables 3-62 through 3-68).

3-1227 FLIGHT TRAINING OBJECTIVES. Flight training, as used in this section, means the conduct of training events in an aircraft or a flight simulation training device (FSTD) in accordance with an approved training curriculum. Flight training (except for wind shear training) may be conducted entirely in an aircraft. Flight training may also be conducted using a combination of an aircraft and an FSTD. In certain cases, flight training may be conducted entirely in a full flight simulator (FFS). In all cases, the primary objective of flight training is to provide an opportunity for flightcrew members to acquire the skills and knowledge necessary to perform to a desired standard. This opportunity provides for demonstration, instruction, and practice of the maneuvers and procedures (training events) pertinent to a particular aircraft and flightcrew member duty position. Successful completion of flight training is validated by appropriate testing and checking.

3-1228 QUALIFICATION OBJECTIVES. The objective of the qualification curriculum segment is to determine whether enough learning has occurred by comparing an individual's performance in practical situations to established standards. A person meeting the qualification objectives satisfactorily completes the curriculum. A person failing to meet these objectives must be returned to training status. After additional training, that person must retake and satisfactorily complete at least the previously unsatisfactory portions of the qualification curriculum segment.

3-1229 FLIGHT TRAINING MODULES OR EVENT OUTLINES.

A. Curriculum Segment. A flight training curriculum segment may be outlined in a modular format or may be outlined as a series of events in which training must be accomplished. This curriculum segment must include as many training modules or events as necessary to provide appropriate training. Each training module or event outline should provide at least the following information:

- A descriptive title of the training module;
- A list of the training events that must be accomplished during flight training;
- Any specific conditions applicable to a particular training event, such as the weather minimums to be used; and
- Provisions for briefing before and after each training period.

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B. Training Outline. The operator may submit an outline containing training modules representing blocks of training events or an outline listing all the elements and events to be accomplished during the flight training. Other forms of presenting the flight training curriculum segment may be acceptable. Regardless of the format used, inspectors should evaluate a proposed flight training curriculum by comparing it with the maneuvers and procedures tables in this section. During actual training, the order and rate of training event presentation may vary. An instructor may vary the events in a published curriculum segment, during any particular period, when a student's progress indicates it is necessary. However, a required event must not be omitted from the curriculum segment. A principal operations inspector (POI) may need to review the operator's flight training courseware, such as lesson plans or instructor guides, to assure that a plan exists in which all events will be appropriately accomplished. To further support that a plan exists, a POI may need to review the forms that will be used to record flight training. It is unnecessary for the POI to approve courseware or training record forms.

C. Aircraft Flight Manual (AFM). It is unnecessary to include detailed descriptions of how specific maneuvers or procedures will be accomplished in a flight training module outline or training event outline. However, detailed descriptions must be included in a Federal Aviation Administration (FAA)-approved AFM, the operator's aircraft operating manual, or a separate maneuvers and procedures document. Detailed descriptions or pictorial displays are required for certain normal, abnormal, and emergency maneuvers, procedures, and functions which are performed in flight training. POIs may require operators to provide extremely detailed training outlines in any of the following situations:

- When directed by the Air Transportation Division (AFS-200);
- When a new technology or procedure is addressed in the training module (examples include fly-by-wire aircraft control and helicopter instrument flight rules (IFR) flight slower than minimum speed (V_{MINI})); and
- When an operator has had approval of a curriculum segment withdrawn because of deficiencies, the POI may require any redeveloped flight curriculum segments to include highly detailed training module or training event outlines. (The level of detail should provide sufficient information for the POI to determine that previously identified deficiencies are corrected.)

D. Regulatory Compliance. To ensure regulatory compliance, the training module or training event outlines must contain at least the training events listed in the appropriate maneuvers and procedures tables in this section. The interrelationship of training modules and/or training events in a curriculum segment should provide for an orderly and practical progression of training. For example, taxiing may be listed as a training event in the first module of a flight training curriculum segment but does not have to be listed in subsequent training modules, even though training on the taxiing maneuver will occur throughout flight training. Training event modules should be developed so that training events are presented in a logical sequence. For example, missed approach training should be conducted in conjunction with approach training.

E. Interrelationship Example. The following example illustrates the interrelationship of a curriculum segment and training modules when a modular format is used:

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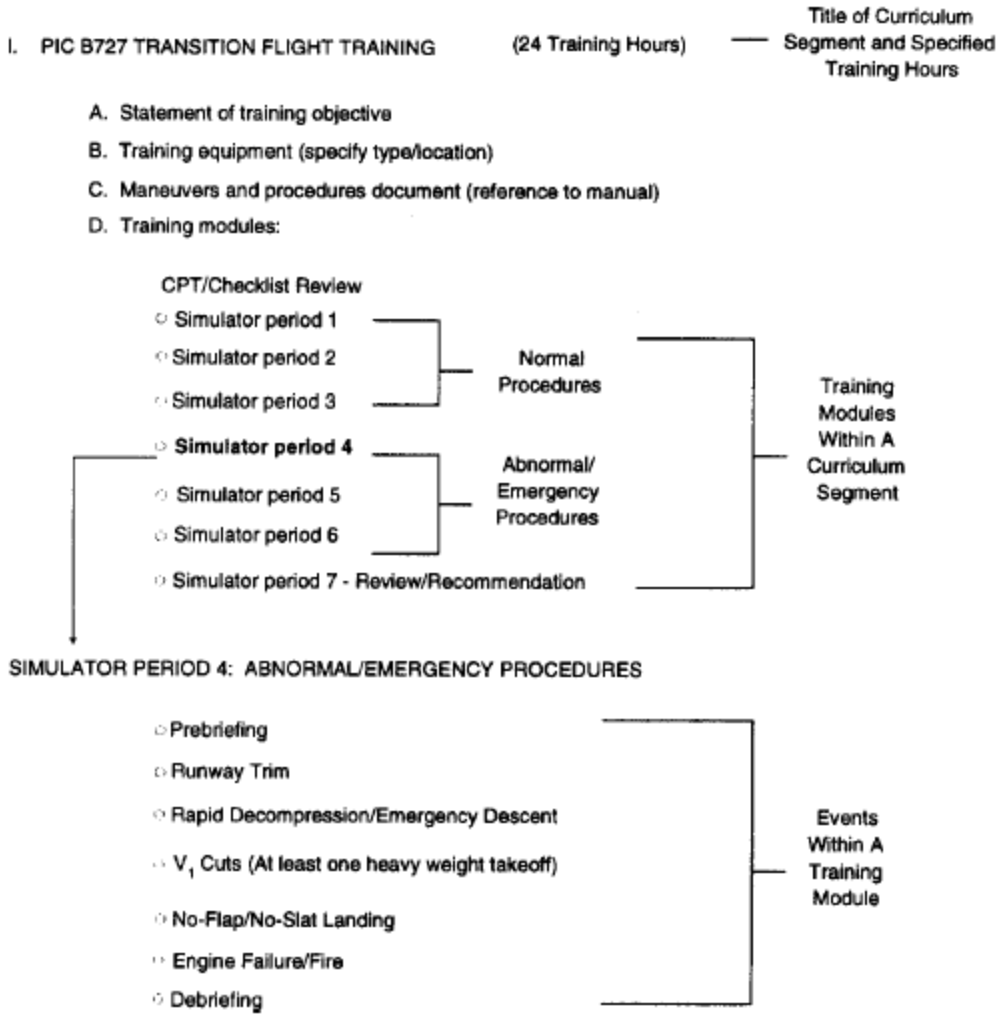
Figure 3-78. Interrelationship of a Curriculum Segment and Training Modules—Modular Format



3-1230 TRAINING HOURS. Flight training curriculum segments must specify the training hours. The operator's proposed number of training hours must realistically allow enough time for demonstration, instruction, and practice of the training events listed in the entire curriculum segment. A POI will not approve a proposed flight training curriculum segment unless the specified training hours realistically allow enough time to accomplish the required training events.

A. Programmed Hours—Part 121. Part 121, §§ 121.424 and 121.425 specify programmed hours of flight training for pilots and Flight Engineers (FE) enrolled in the initial new-hire and initial equipment categories of training. Table 3-58, Title 14 CFR Part 121 Regulatory Programmed Hours by Category of Training, lists the part 121 programmed hours.

1) In accordance with § 121.405(d), a POI may approve a reduction in the 14 CFR programmed hours requirements for initial new-hire and initial equipment categories of training.

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When approving a reduction, a POI must consider the training aids, devices, methods, and procedures listed in the certificate holder's curriculum that increase the quality and effectiveness of the teaching-learning process.

2) Under § 121.418(c), a POI is authorized to approve a modification to the 14 CFR programmed hour requirements for initial new-hire and initial equipment categories of training for designated related aircraft. When approving a modification, the POI must determine that the training hours for the designated related aircraft are realistic based on the training methods and level of differences specified in the Flight Standardization Board (FSB) report. Unless reduced in accordance with § 121.405(d), the 14 CFR programmed hour requirements for initial new-hire and initial equipment categories of training apply to the base aircraft. (See Volume 3, Chapter 19, Section 12, for additional information regarding related aircraft designation and related aircraft differences training).

Table 3-58. Title 14 CFR Part 121 Regulatory Programmed Hours by Category of Training

		Initial New-Hire			**Initial Equipment**		
		PIC	**SIC**	**FE**	**PIC**	**SIC**	**FE**
14 CFR Part 121 Airplane Groups	Group I (Reciprocating)	10	6	6	10	6	6
	Group I (Turboprop)	15	7	7	15	7	7
	Group II (Turbojet)	20	10	10	20	10	10

B. Training Hours. Section 121.427(d)(1)(ii)(A) and (d)(2)(i) stipulates that programmed hours are not specified for pilot or FE recurrent flight training (RFT). However, if the flight training is conducted in an approved FFS, § 121.409(b)(1) requires at least 4 hours of training at the pilot controls for pilot-in-command (PIC) and second-in-command (SIC) training. Four hours of training are required regardless of whether the training is conducted on the events listed in part 121 appendix F or the training is conducted under an approved Line-Oriented Flight Training (LOFT) program.

C. Curriculum Segment Outlines. Part 121 does not specify programmed hours for the other categories of training. Part 135 does not specify programmed hours for any of the categories of training. The number of training hours must be specified, however, on all flight training curriculum segment outlines. Because of the various situations that can be encountered, it is difficult to provide guidance on acceptable training hours for flight training curriculum segments. POIs must thoroughly study an operator's proposals. Based on experience with the operator, past experiences with other operators, as well as their own training experiences, POIs must use reasonable judgment when determining whether the training can be adequately accomplished within the training hours specified by the curriculum segment.

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D. Pilot Concurrent Training. When flight training is conducted in an FSTD, it is acceptable and preferable for the flight training curriculum segment to be developed so that two pilots can be trained during a single flight training session. This includes the training of a PIC and SIC, two PICs, or two SICs at the same time. During this type of training, one pilot (pilot A) manipulates the controls of the aircraft while the other pilot (pilot B) performs the duties of the pilot monitoring (PM) the aircraft. During the same training session, the pilots reverse roles. Pilot B manipulates the controls, and pilot A performs the duties of the PM. The duties of the PM are typically included in the operator's aircraft operating manuals and/or in the maneuvers and procedures document. These duties include normal, abnormal, and emergency duties (that are performed by the PM) and the crew participation activities (Crew Resource Management (CRM) concepts) used by the operator. Both pilots are receiving essential "crew concept" training throughout the training session. Therefore, the total training hours accomplished during the training session can be credited to each of the participating pilots. For example, if a PIC and an SIC participated in a 4-hour FFS session, both pilots would receive 4 hours of training credit. This method of crediting training hours is valid only when both student pilots manipulate the controls for approximately equal amounts of time. This method of crediting training hours is not valid when the instructor is providing instruction and is also occupying one of the pilot seats of the FSTD or aircraft.

E. LOFT Training Session. Both recurrent and qualification LOFT training sessions should be based on at least 4 hours of total crewmember training activity. When the guidance contained in the current edition of Advisory Circular (AC) 120-35, Flightcrew Member Line Operational Simulations: Line-Oriented Flight Training, Special Purpose Operational Training, Line Operational Evaluation, is followed, all crewmembers who participate in a LOFT training session are credited with 4 hours of training time, as follows:

1) Two Trainees. Appropriate crew composition is central to the LOFT training concept. Acceptable scheduling practices and crew substitution allowances differ in recurrent LOFT and qualification LOFT. Refer to AC 120-35 for specific differences. When the crew consists of two PIC trainees or two SIC trainees, both pilots should receive full credit (4 hours) provided the following conditions are met:

- The LOFT session conforms to the minimum 4-hour format described in AC 120-35,
- At least 2½ hours are spent in the LOFT scenario, and
- The pilots swap seats at approximately the midpoint in the LOFT flight segment.

2) One Trainee. When only one trainee participates in qualification LOFT, that trainee should receive full credit (4 hours) provided the following conditions are met:

- The LOFT session conforms to the minimum 4-hour format described in AC 120-35, and
- At least 2½ hours are spent in the LOFT scenario (including spot).

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NOTE: A 2-hour qualification LOFT session for one pilot does not meet the training requirements of part 121 appendix H. A qualification LOFT program consists of at least a 4-hour course of training for each flightcrew.

F. National Norms.

1) Table 3-60, Flight Training Hours (National Norms) Two Pilots—FSTD, and Table 3-61, Flight Training Hours (National Norms) One Pilot—FSTD or When All Training is Conducted in an Aircraft, specify established national norms for flight training curriculum segments. These norms are based on the assumption that there is reasonable training support, such as proficient instructors and well-organized flight instructor guides. The national norms in Table 3-60 are for flight training when most or all of the training is being conducted in an FSTD and when two pilots are being trained at the pilot controls during the same training session (see subparagraph 3-1230D). The national norms in Table 3-61 are for flight training when only one pilot is being trained in an FSTD, or when flight training is conducted entirely in an aircraft.

2) National norms have not been established for related aircraft differences flight training curriculum segments. The training hours required for designated related aircraft will vary based on the training methods and level of differences specified in the FSB report. (See Volume 3, Chapter 19, Section 12, for additional information regarding related aircraft designation and related aircraft differences training.)

G. Adequacy of Training Hours. When determining the adequacy of flight training hours, a POI should use these national norms as a point from which other factors shall be weighed. There may be many reasons why the training hours need to be greater than the national norm. The operator may need to specify more hours because of the complexity of the aircraft or types of operation. The POI may need to require more hours because of inadequate training support. Conversely, training hours fewer than the national norm may be fully acceptable due to the use of highly sophisticated modern training methods, effective systems integration in aircraft ground training, less complex aircraft, or the conduct of a less complex type of operation. Some factors that would indicate a need for more training hours may be counterbalanced by other factors indicating that fewer training hours are necessary. The following diagram illustrates some of the factors that should be considered when determining the adequacy of flight training hours.

Table 3-59. Factors of Flight Training Hours

Special Operations	**No Special Operations**
New Entrant Operator	Basic Servo/Mechanical Instruments
Complex Pilot Operation of Aircraft Systems, Engines, Propellers	Pilot Experience with Similar Aircraft
Critical Aircraft Performance	Modern FSTDs
EFIS, FMS, Autoflight	Well-Organized Flight Instructor Guides
Dissimilar Flightcrew Experience Levels	Basic Navigation System
Low Visibility Capabilities	Simple Flight Handling Characteristics
Complex Navigation Systems	Effective System Integration Training

More than National Norm	National Norm	Less than National Norm

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Table 3-60. Flight Training Hours (National Norms) Two Pilots—FSTD

		CATEGORY OF TRAINING				
	Family of Aircraft	**Initial New-Hire**	**Initial Equipment**	**Transition**	**Upgrade**	**Recurrent**
TRANSPORT AND COMMUTER CATEGORY	Part 121 Group I (Reciprocating)	PIC – 24 SIC – 24 FE – 20	PIC – 20 SIC – 20 FE – 20	PIC – 20 SIC – 20 FE – 20	SIC TO PIC 8 FE TO SIC 20	PIC – 4 SIC – 4 FE – 4
	Part 121 Group I (Turboprop)	PIC – 24 SIC – 24 FE – 20	PIC – 20 SIC – 20 FE – 20	PIC – 20 SIC – 20 FE – 20	SIC TO PIC 8 FE TO SIC 20	PIC – 4 SIC – 4 FE – 4
	Part 121 Group II (Turbojet)	PIC – 28 SIC – 28 FE – 20	PIC – 24 SIC – 24 FE – 20	PIC – 24 SIC – 24 FE – 20	SIC TO PIC 8 FE TO SIC 28	PIC – 4 SIC – 4 FE – 4
	Part 135 Transport and Commuter Category	PIC – 24 SIC – 24	PIC – 20 SIC – 20	PIC – 20 SIC – 20	SIC TO PIC 8	PIC – 4 SIC – 4
MULTI-ENGINE	Part 135 IFR/VFR	PIC – 16 SIC – 16	PIC – 12 SIC – 12	PIC – 8 SIC – 8	SIC TO PIC 4	PIC – 2 SIC – 2
	Part 135 VFR Only	PIC – 4 SIC – 4	PIC – 4 SIC – 4	PIC – 4 SIC – 4	SIC TO PIC 4	PIC – 1 SIC – 1
SINGLE ENGINE	Part 135 IFR/VFR	PIC – 8 SIC – 8	PIC – 4 SIC – 4	PIC – 4 SIC – 4	SIC TO PIC 2	PIC – 2 SIC – 2
	Part 135 VFR Only	PIC – 4 SIC – 4	PIC – 4 SIC – 4	PIC – 2 SIC – 4	SIC TO PIC 2	PIC – 1 SIC – 1
HELICOPTER	IFR/VFR	PIC – 16 SIC – 16	PIC – 12 SIC – 12	PIC – 8 SIC – 8	SIC TO PIC 4	PIC – 2 SIC – 2
	VFR Only	PIC – 4 SIC – 4	PIC – 4 SIC – 4	PIC – 4 SIC – 4	SIC TO PIC 4	PIC – 1 SIC – 1

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Table 3-61. Flight Training Hours (National Norms) One Pilot—FSTD or When All Training is Conducted in an Aircraft

		CATEGORY OF TRAINING				
	Family of Aircraft	**Initial New-Hire**	**Initial Equipment**	**Transition**	**Upgrade**	**Recurrent**
TRANSPORT AND COMMUTER CATEGORY	Part 121 Group I (Reciprocating)	PIC – 14 SIC – 14 FE – 12	PIC – 14 SIC – 14 FE – 12	PIC – 12 SIC – 12 FE – 12	SIC TO PIC 6 FE TO SIC 14	PIC – 4 SIC – 4 FE – 4
	Part 121 Group I (Turboprop)	PIC – 15 SIC – 15 FE – 12	PIC – 15 SIC – 15 FE – 12	PIC – 12 SIC – 12 FE – 12	SIC TO PIC 6 FE TO SIC 15	PIC – 4 SIC – 4 FE – 4
	Part 121 Group II (Turbojet)	PIC – 20 SIC – 16 FE – 12	PIC – 20 SIC – 16 FE – 12	PIC – 12 SIC – 12 FE – 12	SIC TO PIC 6 FE TO SIC 16	PIC – 4 SIC – 4 FE – 4
	Part 135 Transport and Commuter Category	PIC – 12 SIC – 12	PIC – 10 SIC – 10	PIC – 8 SIC – 8	SIC TO PIC 6	PIC – 4 SIC – 4
MULTI-ENGINE	Part 135 IFR/VFR	PIC – 8 SIC – 8	PIC – 6 SIC – 6	PIC – 6 SIC – 6	SIC TO PIC 4	PIC – 3 SIC – 3
	Part 135 VFR Only	PIC – 4 SIC – 4	PIC – 3 SIC – 3	PIC – 3 SIC – 3	SIC TO PIC 2	PIC – 2 SIC – 2
SINGLE ENGINE	Part 135 IFR/VFR	PIC – 6 SIC – 6	PIC – 4 SIC – 4	PIC – 4 SIC – 4	SIC TO PIC 4	PIC – 3 SIC – 3
	Part 135 VFR Only	PIC – 3 SIC – 2	PIC – 2 SIC – 1	PIC – 2 SIC – 1	SIC TO PIC 1	PIC – 1 SIC – 1
HELICOPTER	IFR/VFR	PIC – 10 SIC – 10	PIC – 8 SIC – 8	PIC – 6 SIC – 6	SIC TO PIC 4	PIC – 4 SIC – 4
	VFR Only	PIC – 4 SIC – 4	PIC – 3 SIC – 3	PIC – 3 SIC – 3	SIC TO PIC 2	PIC – 2 SIC – 2

3-1231 COURSE COMPLETION REQUIREMENTS.

A. Failure to Meet Requirements. Ordinarily, a flightcrew member completes a flight training curriculum segment by successfully accomplishing each training event and the specified number of training hours. Flightcrew members are then required to successfully meet the requirements specified in the qualification curriculum segment (see Volume 3, Chapter 19, Section 7, for the qualification curriculum segment requirements). If a person fails to meet any of the qualification requirements because of a lack in flight proficiency, that person must be returned to training status. After retraining, an instructor recommendation is required for reaccomplishing the unsatisfactory qualification requirement.

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B. Exceptions to Requirements. A flightcrew member may successfully complete a flight training curriculum segment without completing the specified number of training hours, provided all of the following conditions are met:

1) The crewmember successfully completes all of the training events required by the curriculum segment.

2) An instructor recommends the flight test be conducted before completion of the specified number of training hours. The recommendation must be suitably documented.

3) The flightcrew member satisfactorily completes the qualification curriculum segment requirements. If a flightcrew member fails to meet the qualification curriculum segment requirements because of a lack of flight proficiency, he or she must be required to complete all the training hours specified in the flight training curriculum segment. The crewmember must then be recommended by an instructor before being rechecked on the failed qualification requirements.

3-1232 EVALUATION OF FLIGHT TRAINING CURRICULUM SEGMENT OUTLINES FOR INITIAL APPROVAL. When evaluating a flight training proposal for initial approval, an inspector must determine that the proposed curriculum segment meets the following requirements:

A. Maneuvers and Procedures Table. The training events must be consistent with the maneuvers and procedures tables applicable to the specific category of training. An inspector must select the appropriate maneuvers and procedures table and make a side-by-side comparison of the table and the proposed flight training curriculum segment. The required training events and the appropriate level FSTD or aircraft to be used must be in the proposal. Omission of any required training event or inappropriate use of an FSTD is sufficient reason to deny initial approval.

B. Realistic Training Hours. The specified training hours are realistic, as discussed in paragraph 3-1230.

C. Examining Courseware. The training emphasizes specific areas applicable to the category of training. Since flight training curriculum outlines are not usually constructed in a manner that allows for a determination that appropriate areas are emphasized, an inspector must examine courseware (such as flight instructor guides and LOFT scenarios) to determine if appropriate areas will be emphasized and if the operator is capable of developing acceptable courseware. In the paragraphs preceding the applicable maneuvers and procedures tables in this section, training emphasis considerations for each category of flight training are discussed.

3-1233 EVALUATING THE OPERATOR'S MANEUVERS AND PROCEDURES DOCUMENT. The operator must provide a maneuvers and procedures document for approval by the FAA. An inspector must determine that this document provides detailed descriptions or pictorial displays for the normal, abnormal, and emergency maneuvers, including the procedures and functions that will be performed in flight training. Instructor guides or lesson plans which support the maneuvers and procedures document should specify the conditions (such as weather, aircraft weight, and other parameters) to be applied during training on a maneuver or procedure.

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The conditions specified in these guides or lesson plans should be equivalent to the types of operations authorized by the operations specifications (OpSpecs), such as low visibility takeoffs or the use of Category (CAT) I Approach or CAT II Approach minimums. FAA policy requires detailed descriptions (or pictorial displays) of at least those training events identified with the symbol "M" in the appropriate maneuvers and procedures tables. Maneuvers and procedures documents must be evaluated in sufficient detail to ensure the following requirements are met:

A. FSB Recommendations. The descriptions of applicable maneuvers or procedures must conform to recommendations made in the FSB report when appropriate.

B. Flight Manual. The description of each maneuver or procedure must conform to the operating limitations and procedures in the FAA-approved AFM/Rotorcraft Flight Manual (RFM) or the operator's aircraft operating manual.

C. Procedural Instructions. The description of each maneuver or procedure must conform to the certificate holder's procedural instructions for flight deck checks, altitude awareness, required callouts, crew coordination, and CRM.

D. Specify Procedures. The description of each maneuver or procedure must specify the operator's procedures, such as altitudes, configuration airspeeds, and other parameters.

3-1234 AIRCRAFT FAMILIES. The four families of aircraft used in part 121 and part 135 operations are described in Volume 3, Chapter 19, Section 1, paragraph 3-1073. The flight training requirements for flightcrew members differ significantly between each family. Within each family, the flight training requirements are similar, even though individual aircraft may differ significantly in construction and appearance. The maneuvers and procedures tables have been tailored to account for similar flightcrew member knowledge, skill, and ability requirements common to aircraft of a particular family and specific to different kinds of operations within a family.

A. Transport and Commuter Category Airplane Family. Airplanes in this family are similar in operational characteristics. Flightcrew members of airplanes in this family are required to have similar knowledge, skills, and abilities regardless of the applicable operating regulation (part 121 or part 135). The maneuvers and procedures tables containing required training events for flightcrew members operating airplanes in this family are in paragraphs 3-1245 through 3-1248 (see Tables 3-62 through 3-65).

B. Multiengine General Purpose Airplane Family. Flightcrew members of airplanes in this family are required to have similar knowledge, skills, and abilities when operating under part 135. The flight training events required for flightcrew members operating airplanes in this family are identified in the maneuvers and procedures table in paragraph 3-1249 (see Table 3-66, Flight Training PIC/SIC Training (All Training Categories)—Multiengine General Purpose Airplanes).

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C. Single-Engine Airplane Family. Flightcrew members of airplanes in this family are required to have similar knowledge, skills, and abilities to be operated under part 135. The flight training events required for the operation of single-engine airplanes are identified in the maneuvers and procedures table in paragraph 3-1250 (see Table 3-67, Flight Training PIC/SIC Flight Training (All Training Categories)—Single-Engine Airplanes).

D. Helicopter Family. Flightcrew members operating helicopters under part 135 are required to have similar knowledge, skills, and abilities. The flight training events required for flightcrew members operating helicopters are identified in the maneuvers and procedures table (see Table 3-68, Flight Training PIC/SIC Flight Training (All Training Categories)—Helicopter (under development)).

3-1235 FSTD. Flight training equipment consists of flight training devices (FTD), FFSs, and the aircraft. The approved use of each item of flight training equipment is listed in the maneuvers and procedures tables. These FTDs and FFSs are the only types of flight training equipment (other than aircraft) which may be approved for use in an FAA-approved flight training program. Before any level 4 or 5 FTD can be used, it must be evaluated by the POI to determine that it meets the prescribed requirements for the appropriate level of FTD. Before a level 6 or higher FTD or any level FFS can be used, it must be evaluated and qualified by the National Simulator Program (NSP) and approved by the operator's POI. The following paragraphs describe the FSTDs applicable to parts 121 and 135 flight training. Title 14 CFR part 60 specifies the qualification, maintenance, and evaluation requirements for FSTDs. For previously qualified FSTDs, as permitted by part 60, § 60.17, the current edition of AC 120-40, Airplane Simulator Qualification; AC 120-45, Airplane Flight Training Device Qualification; AC 121-14, Aircraft Simulator Evaluation and Approval; or AC 120-63, Helicopter Simulator Qualification, provides the qualification policy and criteria. The functional descriptions in the following paragraphs provide only a brief overview. Therefore, part 60 and the appropriate ACs, if applicable, are the only authorized source documents and must be used for evaluation and approval of FSTDs.

NOTE: Levels 1 through 3 FTDs may not be used in part 121 or part 135 training programs.

3-1236 LEVEL 4 FTD.

A. Purpose. To permit learning, development, and the practice of skills and flight deck procedures necessary for understanding and operating the integrated systems of a specific aircraft.

B. Functional Description. A level 4 FTD has the following characteristics and components:

- A replica of the flight deck panels, switches, controls, and instruments, in proper relationship, to represent the aircraft for which training is to be accomplished;
- Systems indications which respond appropriately to switches and controls which are required to be installed for the training or checking to be accomplished; and
- Air/ground logic (however, simulated aerodynamic capabilities are not required).

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3-1237 LEVEL 5 FTD.

A. Purpose. To permit learning, development, and the practice of skills, flight deck procedures, and Instrument Flight Procedures (IFP) necessary for understanding and operating the integrated systems of a specific aircraft in typical flight operations in real time.

B. Functional Description. A level 5 FTD has the following characteristics and components:

- A replica of the flight deck panels, switches, controls, and instruments, in proper relationship, to represent the aircraft for which training is to be accomplished;
- Systems indications which respond appropriately to switches and controls which are required to be installed for the training or checking to be accomplished;
- Simulated aerodynamic capabilities representative of the aircraft group or class;
- Functional flight and navigational controls, displays, and instrumentation; and
- Control forces and control travel of sufficient precision for manually flying an instrument approach.

3-1238 LEVEL 6 FTD.

A. Purpose. To permit learning, development, and the practice of skills in flight deck procedures, IFPs, certain symmetrical maneuvers, and flight characteristics necessary for operating the integrated systems of a specific aircraft in typical flight operations.

B. Functional Description. A level 6 FTD has the following characteristics and components:

- Systems indications which respond appropriately to switches and controls which are required to be installed;
- A replica of the flight deck of the aircraft for which training is to be accomplished;
- Simulated aerodynamic capabilities which closely represent the specific aircraft in ground and flight operations;
- Functional flight and navigational controls, displays, and instrumentation;
- Control forces and control travel which correspond to the aircraft; and
- Instructor controls.

3-1239 LEVEL A FFS.

A. Purpose. To permit development and practice of the necessary skills for accomplishing flight operational tasks, to a prescribed standard of airman competency, in a specific aircraft and duty position. Level A FFSs may be used for specified pilot recency-of-experience requirements and specified flight operational task training requirements in transition, upgrade, recurrent, and requalification training under parts 121 and 135. It may also be used for initial new-hire and initial equipment training on specified events.

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B. Functional Description. Level A FFSs have the following characteristics and components:

- Systems representations, switches, and controls which are required by the type design of the aircraft and by the user's approved training program;
- Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated;
- A full-scale replica of the flight deck of the aircraft being simulated;
- Correct simulation of the aerodynamic characteristics of the aircraft being simulated;
- Correct simulation of the effects of selected environmental conditions which the simulated aircraft might encounter;
- Control forces and travel which correspond to the aircraft;
- Instructor controls and seat;
- At least a night visual system with the minimum of a 45-degree horizontal by 30-degree vertical field of view (FOV) for each pilot station; and
- A motion system with at least 3 degrees of freedom.

3-1240 LEVEL B FFS.

A. Purpose. To permit development and practice of the necessary skills for accomplishing flight operational tasks, to a prescribed standard of airman competency, in a specific aircraft and duty position. Level B FFSs may be used for pilot recency-of-experience requirements and for specified flight operational task training requirements in transition, upgrade, recurrent, and requalification training under parts 121 and 135. It may also be used for initial new-hire and initial equipment training on specified events. Level B FFSs may also be used to accomplish night takeoffs and landings, and for landings in a proficiency check.

B. Functional Description. Level B FFSs have the following characteristics and components:

- Systems representations, switches, and controls which are required by the type design of the aircraft and by the user's approved training program;
- Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated;
- A full-scale replica of the flight deck of the aircraft being simulated;
- Correct simulation of the aerodynamic (including ground effect) and ground dynamic characteristics of the aircraft being simulated;
- Correct simulation of the effects of selected environmental conditions which the simulated aircraft might encounter;
- Control forces and travel which correspond to the aircraft;
- Instructor controls and seat;
- At least a night visual system with a minimum of a 45-degree horizontal by 30-degree vertical FOV for each pilot station; and
- A motion system with at least 3 degrees of freedom.

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3-1241 LEVEL C FFS.

A. Purpose. To permit development and practice of the necessary skills for accomplishing flight operational tasks to a prescribed standard of airman competency in a specific aircraft and duty position. Level C FFSs may be used for pilot recency-of-experience requirements and for specified flight operational task training in transition, upgrade, recurrent, and requalification training under parts 121 and 135. It may also be used for initial new-hire and initial equipment training for all events. All training events may be conducted in a level C FFS for persons who have previously qualified as PIC or SIC with that operator.

B. Functional Description. Level C FFSs have at least the following characteristics and components:

- Systems representations, switches, and controls which are required by the type design of the aircraft and by the user's approved training program;
- Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated;
- A full-scale replica of the flight deck of the aircraft being simulated;
- Correct simulation of the aerodynamic (including ground effect) and ground dynamic characteristics of the aircraft being simulated;
- Correct simulation of the effects of selected environmental conditions which the simulated aircraft might encounter;
- Control forces, dynamics, and travel which correspond to the aircraft;
- Instructor controls and seat;
- At least a night and dusk visual system with a minimum of a 75-degree horizontal by 30-degree vertical FOV for each pilot station; and
- A motion system with at least 6 degrees of freedom.

3-1242 LEVEL D FFS.

A. Purpose. To permit development and practice of the necessary skills for accomplishing flight operational tasks to a prescribed standard of airman competency in a specific aircraft and duty position. Level D FFSs may be used for parts 121 and 135 pilot recency-of-experience requirements and for all flight operational task training, except for static aircraft training.

B. Functional Description. Level D FFSs have the following characteristics and components:

- Systems representations, switches, and controls which are required by the type design of the aircraft and by the user's approved training program;
- Systems which respond appropriately and accurately to the switches and controls of the aircraft being simulated;
- A full-scale replica of the flight deck of the aircraft being simulated;
- Correct simulation of the aerodynamic (including ground effect) and ground dynamic characteristics of the aircraft being simulated;

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- Correct simulation of selected environmentally affected aerodynamic and ground dynamic characteristics of the aircraft being simulated considering the full range of its flight envelope in all approved configurations;
- Correct and realistic simulation of the effects of environmental conditions which the aircraft might encounter;
- Control forces, dynamics, and travel which correspond to the aircraft;
- Instructor controls and seat;
- A daylight, dusk, and night visual system with the minimum of a 75-degree horizontal by 30-degree vertical FOV for each pilot station; and
- A motion system with at least 6 degrees of freedom.

3-1243 MANEUVERS AND PROCEDURES TABLES.

A. Compliance. The events which must be accomplished during flight training are listed in the maneuvers and procedures tables in this section. The requirements of parts 121 and 135 are included in these tables. These tables can be used as a single-source document in the development and evaluation of flight training curriculum segment proposals. Compliance with the provisions of these tables automatically ensures that all requirements of both parts 121 and 135 are met. These tables also contain the acceptable flight training equipment (FSTD or aircraft) which may be used for any training event. An “X” indicates that the specified FSTD has been qualified for that event without further consideration or approval. An “A” indicates that a lower-level FSTD may be used for procedural training if that device has the necessary systems representations and functions for training on the event. These systems representations and functions exceed the basic requirements for that level FSTD; therefore, an “A” indicates that the FSTD must be evaluated and approved for each particular event. Any maneuver or procedure permitted in a specific level of FSTD may also be conducted in a higher level of FSTD or the aircraft itself (provided the event can safely be accomplished in the aircraft). Certain training events within the tables are preceded with a box ([ ]). If the operator is authorized (or required) to conduct these maneuvers by OpSpecs (e.g., a circling approach), a POI should check the appropriate box to indicate these events must be included in the training curriculum. Certain optional training events indicated by a pound sign (#) in the maneuvers and procedures tables are not specifically required by the regulations or OpSpecs. Many of these optional training events, however, are often included in an operator’s flight training curriculums and should be conducted in a properly qualified FSTD.

NOTE: See paragraph 3-1233 for description of maneuvers marked with the letter M.

B. Wind Shear Training. Wind shear training is a training event in each table. The tables indicate that wind shear training may only be performed in an FFS. Operators who do not use an FFS may perform their wind shear/microburst training in accordance with the guidelines in the FAA Wind Shear Training Aid.

C. Ice-Contaminated Tailplane Stall (ICTS). Verify training includes AFM limitations and procedures for operating in icing conditions, if available. For airplanes that are not susceptible to ICTS, verify tailplane stall recovery is not included. For airplanes that have not been evaluated for ICTS, verify training includes manufacturer recommendations regarding

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operations in icing conditions, if available. Contact the Small Airplane Directorate Standards Office (ACE-110) for a list of airplanes susceptible to ICTS.

D. Requirements Paragraph. Preceding each maneuver and procedure table is a paragraph which states the required maneuvers and procedures for each flightcrew member and provides guidance on specific areas of emphasis which should be included in the training.

3-1244 PIC/SIC INITIAL NEW-HIRE AND INITIAL EQUIPMENT FLIGHT TRAINING—TRANSPORT AND COMMUTER CATEGORY AIRPLANES.

A. Required Maneuvers and Procedures. Training in the maneuvers and procedures in Table 3-62, Flight Training PIC/SIC Initial New-Hire and Initial Equipment Flight Training—Transport and Commuter Category Airplanes, must be conducted for satisfactory completion of initial new-hire and initial equipment flight training.

1) PICs must complete training in each training event in this table.

2) SICs must complete training in each training event in this table. SIC training in the following events does not require manipulation of the primary aircraft controls but should emphasize duties of the PM:

- Approach and landing with pitch mistrim,
- Approach and landing with 50 percent loss of power,
- Approach and landing with flap/slat malfunction, and
- Steep turns.

B. Training Emphasis Considerations. A POI should ensure that the operator's flight training emphasizes appropriate areas for these categories of training:

1) For initial new-hire training, emphasis should be on specific company procedures and procedures for the particular aircraft.

2) For initial equipment training, emphasis should be on company procedures specific to the aircraft.

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Table 3-62. Flight Training PIC/SIC Initial New-Hire and Initial Equipment Flight Training—Transport and Commuter Category Airplanes (Front Side)

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
PREPARATION	Visual Inspection (For aircraft with FE, use of pictorial display authorized)									X
	Prestart Procedures	A	A	X		X	X	X	X	X
	Performance Limitations	X	X	X		X	X	X	X	X
SURFACE OPERATION	Pushback			X		X	X	X	X	X
	[ ] Powerback Taxi							X	X	X
	Starting	A	A	X		X	X	X	X	X
	Taxi/Runway Operations							X	X	X
	Pretakeoff Checks	A	A	X		X	X	X	X	X
TAKEOFF	Normal M							X	X	X
	Crosswind							X	X	X
	Rejected M			X		X	X	X	X	X
	Power Failure V_1 M					X	X	X	X	X
	Powerplant Failure During Second Segment #					X	X	X	X	X
	[ ] Lower than Standard Minimum					X	X	X	X	X
CLIMB	Normal			X		X	X	X	X	X
	One Engine Inoperative During Climb to En Route Altitude #					X	X	X	X	X
EN ROUTE	Steep Turns PIC			X		X	X	X	X	X
	Stall Prevention (Approaches to Stalls): M (Takeoff Config.) (En Route Config.) (Landing Config.) X* The approved recovery procedure must be initiated at the first indication of an impending stall (buffet, stick shaker, aural warning).			X*		X	X	X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
	Inflight Powerplant Shutdown	A	A	X		X	X	X	X	X
	Inflight Powerplant Restart		A	X		X	X	X	X	X
	High-Speed Handling Characteristics					X	X	X	X	X
DESCENT	Normal			X		X	X	X	X	X
	Maximum Rate					X	X	X	X	X
APPROACHES	VFR Procedures M Visual Approach							X	X	X
	With 50 percent loss of power on one-side PIC M (2 engines inoperative on 3-engine airplanes) A* (May be accomplished in levels A or B provided one-engine-inoperative training is conducted in level C or D, or the aircraft)					A*	A*	X	X	X
	With Slat/Flap Malfunction PIC M					X	X	X	X	X
	IFR Precision Approaches M ILS/Normal							X	X	X
	ILS/One Engine Inoperative							X	X	X
	[ ] PAR/Normal					X	X	X	X	X
	[ ] PAR/One Engine Inoperative #					X	X	X	X	X
	IFR Nonprecision Approaches M NDB/Normal			A*		X	X	X	X	X
	VOR/Normal A* At least one Nonprecision approach must be accomplished in a FFS or the aircraft			A*		X	X	X	X	X
	Nonprecision Approach One Engine Inoperative #		A	X		X	X	X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
	[ ] LOC Backcourse Procedures		A	X		X	X	X	X	X
	[ ] SDF/LDA Procedures		A	X		X	X	X	X	X
	[ ] ASR Procedures		A	X		X	X	X	X	X
	[ ] RNAV Procedures		A	X		X	X	X	X	X
	[ ] LORAN C Procedures		A	X		X	X	X	X	X

Table 3-62. Flight Training PIC/SIC Initial New-Hire and Initial Equipment Flight Training—Transport and Commuter Category Airplanes (Back Side)

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
APPROACHES (Cont'd)	[ ] Circling Approach M (FFS must be qualified for training/checking on the circling maneuver)							X	X	X
	Missing Approaches M From Precision Approach					X	X	X	X	X
	From Nonprecision Approach					X	X	X	X	X
	With Powerplant Failure					X	X	X	X	X
	NOTE: At least one MAP must be a complete approved procedure. At least one MAP must be with a powerplant failure									
LANDINGS	Normal							X	X	X
	With Pitch Mistrim PIC							X	X	X
	From Precision Instrument Approach							X	X	X
	From Precision Instrument Approach With Most Critical Engine Inoperative							X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
	With 50 percent loss of power on one side PIC (2 engines inoperative on 3-engine airplanes) A* (May be accomplished in Levels A or B, provided one-engine-inoperative training is conducted in level C or D, or the aircraft.)					A*	A*	X	X	X
	With Flap/Slat Malfunction					X	X	X	X	X
	Crosswind							X	X	X
	With Manual Reversion/Degraded Control Augmentation					X	X	X	X	X
AFTER LANDING	Parking #							X	X	X
	Emergency Evacuation #			X		X	X	X	X	X
OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE	Holding			X		X	X	X	X	X
	Ice Accumulation on Airframe #					X	X	X	X	X
	Air Hazard Avoidance #					A	A	X	X	X
	Wind Shear/Microburst #					X	X	X	X	
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE - Normal - Abnormal - Alternate	Pneumatic/Pressurization	A	A	X		X	X	X	X	X
	Air Conditioning	A	A	X		X	X	X	X	X
	Fuel and Oil	A	A	X		X	X	X	X	X
	Electrical	A	A	X		X	X	X	X	X
	Hydraulic	A	A	X		X	X	X	X	X
	Flight Controls	A	A	X		X	X	X	X	X
	Anti-Icing and Deicing Systems			X		X	X	X	X	X
	Autopilot (AP)		A	X		X	X	X	X	X
	Flight Management Guidance Systems and/or Automatic or Other Approach & Landing Aids		A	X		X	X	X	X	X
	Stall Warning Devices, Stall Avoidance Devices, and Stability Augmentation Systems			X		X	X	X	X	X
	Airborne Weather Radar	A	A	X		X	X	X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
	Flight Instrument System Malfunction		A	X		X	X	X	X	X
	Communications Equipment	A	A	X		X	X	X	X	X
	Navigation Systems	A	A	X		X	X	X	X	X
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE - Emergency	Aircraft Fires	A	A	X		X	X	X	X	X
	Smoke Control	A	A	X		X	X	X	X	X
	Powerplant Malfunctions	A	A	X		X	X	X	X	X
	Fuel Jettison	A	A	X		X	X	X	X	X
	Electrical, Hydraulic, Pneumatic Systems	A	A	X		X	X	X	X	X
	Flight Control Systems Malfunction	A	A	X		X	X	X	X	X
	Landing Gear and Flap Systems Malfunction	A	A	X		X	X	X	X	X

3-1245 PIC/SIC TRANSITION AND UPGRADE FLIGHT TRAINING—TRANSPORT AND COMMUTER CATEGORY AIRPLANES.

A. Required Maneuvers and Procedures. Training in the maneuvers and procedures in Table 3-63, Flight Training PIC/SIC Transition and Upgrade Flight Training—Transport and Commuter Category Airplanes, must be conducted for satisfactory completion of transition or upgrade flight training.

1) PIC Transition Training. PICs must complete training in each training event in this table.

2) SIC Transition Training. SICs must complete training in each training event in this table. SIC training in the following events does not require manipulation of the primary flight controls but should emphasize the duties of the PM:

- Approach and landing with pitch mistrim,
- Approach and landing with 50 percent loss of power,
- Approach and landing with flap/slat malfunction, and
- Steep turns.

3) PIC Upgrade Training. An SIC upgrading to PIC must complete training in each training event in this table (including those marked “PIC”).

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4) Appendix H SIC-to-PIC Initial Equipment Training. Part 121 appendix H Level C, Training and Checking Permitted, permits certain SICs to be trained as PICs in a different aircraft of the same group if the training is conducted in a level C FFS. Because of the experience levels required in appendix H for SICs in this type of training, (which is actually initial equipment training) the training may be accomplished in the same manner as PIC upgrade training.

5) SIC Upgrade Training. FEs upgrading to SIC must complete training in each training event in Table 3-63. FEs upgrading to SIC are not required to manipulate the primary flight controls for the following events, but should receive training which emphasizes duties of the PM. The training events are as follows:

- Approach and landing with pitch mistrim,
- Approach and landing with 50 percent loss of power,
- Approach and landing with flap/slat malfunction, and
- Steep turns.

B. Training Emphasis Considerations. POIs should ensure that the operator's transition and upgrade training emphasizes the appropriate areas for these categories of training:

1) For transition training, emphasis should be on the handling characteristics and the maneuvers and procedures pertinent to the specific aircraft type.

2) For upgrade training, emphasis should be on the specific duties and responsibilities pertinent to the flightcrew member position. Additionally, in the case of an FE upgrading to SIC, maneuver-emphasis training (particularly in approaches and landings) should be included.

Table 3-63. Flight Training PIC/SIC Transition and Upgrade Flight Training—Transport and Commuter Category Airplanes (Front Side)

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
PREPARATION	Visual Inspection (For aircraft with FE, use of pictorial display authorized)									X
	Prestart Procedures	A	A	X		X	X	X	X	X
	Performance Limitations	X	X	X		X	X	X	X	X
SURFACE OPERATION	Pushback			X		X	X	X	X	X
	[ ] Powerback Taxi							X	X	X
	Starting	A	A	X		X	X	X	X	X
	Taxi							X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
	Pretakeoff Checks	A	A	X		X	X	X	X	X
TAKEOFF	Normal M							X	X	X
	Crosswind							X	X	X
	Rejected M			X		X	X	X	X	X
	Power Failure V1 M					X	X	X	X	X
	Powerplant Failure During Second Segment #					X	X	X	X	X
	[ ] Lower than Standard Minimum					X	X	X	X	X
CLIMB	Normal			X		X	X	X	X	X
	One Engine Inoperative During Climb to En Route Altitude #					X	X	X	X	X
EN ROUTE	Steep Turns PIC			X		X	X	X	X	X
	Stall Prevention (Approaches to Stalls): M (Takeoff Config.) (En Route Config.) (Landing Config.) X* The approved recovery procedure must be initiated at the first indication of an impending stall (buffet, stick shaker, aural warning).			X*		X	X	X	X	X
	Inflight Powerplant Shutdown	A	A	X		X	X	X	X	X
	Inflight Powerplant Restart		A	X		X	X	X	X	X
	High-Speed Handling Characteristics					X	X	X	X	X
DESCENT	Normal			X		X	X	X	X	X
	Maximum Rate					X	X	X	X	X
APPROACHES	VFR Procedures M Visual Approach							X	X	X
	With 50 percent Loss of Power on One side PIC M (2 engines inoperative on 3 engine airplanes)					X	X	X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
	With Slat/Flap Malfunction PIC M					X	X	X	X	X
	IFR Precision Approaches M ILS/Normal							X	X	X
	ILS/One Engine Inoperative					X	X	X	X	X
	[ ] PAR/Normal			X		X	X	X	X	X
	[ ] PAR/One Engine Inoperative #					X	X	X	X	X
	IFR Nonprecision Approaches M NDB/Normal			A*		X	X	X	X	X
	VOR/Normal A* At least one Nonprecision approach must be accomplished in a FFS or the aircraft			A*		X	X	X	X	X
	Nonprecision Approach One-Engine Inoperative #					X	X	X	X	X
	[ ] LOC Backcourse Procedures		A	X		X	X	X	X	X
	[ ] SDF/LDA Procedures		A	X		X	X	X	X	X
	[ ] ASR Procedures		A	X		X	X	X	X	X
	[ ] RNAV Procedures		A	X		X	X	X	X	X
	[ ] LORAN C Procedures		A	X		X	X	X	X	X

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Table 3-63. Flight Training PIC/SIC Transition and Upgrade Flight Training—Transport and Commuter Category Airplanes (Back Side)

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
APPROACHES (Cont'd)	Missing Approaches M From Precision Approach					X	X	X	X	X
	From Nonprecision Approach					X	X	X	X	X
	With Powerplant Failure					X	X	X	X	X
	NOTE: At least one MAP must be a complete approved procedure. At least one MAP must be with a powerplant failure									
LANDINGS	Normal							X	X	X
	With Pitch Mistrim PIC					X	X	X	X	X
	From Precision Instrument Approach							X	X	X
	From Precision Instrument Approach With Most Critical Engine Inoperative							X	X	X
	With 50 percent Loss of Power on One Side PIC (2 engines inoperative on 3-engine airplanes)					X	X	X	X	X
	With Flap/Slat Malfunction					X	X	X	X	X
	Crosswind							X	X	X
	With Manual Reversion/Degraded Control Augmentation					X	X	X	X	X
AFTER LANDING	Parking #							X	X	X
	Emergency Evacuation #			X		X	X	X	X	X
OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE	Holding			X		X	X	X	X	X
	Ice Accumulation on Airframe #			X		X	X	X	X	X
	Air Hazard Avoidance #					A	X	X	X	X
	Wind Shear/Microburst #					X	X	X	X	
SYSTEMS PROCEDURES	Pneumatic/Pressurization	A	A	X		X	X	X	X	X
	Air Conditioning	A	A	X		X	X	X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
TRAINING DURING ANY PHASE - Normal - Abnormal - Alternate	Fuel and Oil	A	A	X		X	X	X	X	X
	Electrical	A	A	X		X	X	X	X	X
	Hydraulic	A	A	X		X	X	X	X	X
	Flight Controls	A	A	X		X	X	X	X	X
	Anti-Icing and Deicing Systems			X		X	X	X	X	X
	Autopilot		A	X		X	X	X	X	X
	Flight Management Guidance Systems and/or Automatic or Other Approach and Landing Aids		A	X		X	X	X	X	X
	Stall Warning Devices, Stall Avoidance Devices, and Stability Augmentation Systems			X		X	X	X	X	X
	Airborne Weather Radar	A	A	X		X	X	X	X	X
	Flight Instrument System Malfunction		A	X		X	X	X	X	X
	Communications Equipment	A	A	X		X	X	X	X	X
	Navigation Systems	A	A	X		X	X	X	X	X
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE - Emergency	Aircraft Fires	A	A	X		X	X	X	X	X
	Smoke Control	A	A	X		X	X	X	X	X
	Powerplant Malfunctions	A	A	X		X	X	X	X	X
	Fuel Jettison	A	A	X		X	X	X	X	X
	Electrical, Hydraulic, Pneumatic Systems	A	A	X		X	X	X	X	X
	Flight Control Systems Malfunction	A	A	X		X	X	X	X	X
	Landing Gear and Flap Systems Malfunction	A	A	X		X	X	X	X	X

3-1246 PIC/SIC RFT—TRANSPORT AND COMMUTER CATEGORY AIRPLANES.

A. Required Maneuvers and Procedures. Training in the maneuvers and procedures in Table 3-64, Flight Training PIC/SIC Recurrent and Requalification Flight Training—Transport and Commuter Category Airplanes, in accordance with the following paragraphs, must be conducted for the satisfactory completion of RFT.

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1) Part 135 RFT. Part 135 RFT must be conducted periodically, at least once every 12 months, for both PICs and SICs. Part 135, § 135.351(c) specifies that RFT for pilots must include at least "flight training in the maneuvers or procedures in this subpart, except that satisfactory completion of the check required by § 135.293" (the competency check) "may be substituted for recurrent flight training." The competency check may include any of the maneuvers and procedures currently required for the original issuance of the particular pilot certificate, for the operations authorized, and appropriate to the category, class, and type of aircraft involved. The instrument proficiency check (IPC), as specified in § 135.293(c), may be substituted for the competency check. Additionally, there are no provisions in part 135 that allow recurrent training to substitute for required checks or tests. There are no training appendices in part 135 containing lists of the required maneuvers and procedures for flight training or checking. Training on the events in the applicable tables in this section meets the part 135 competency and IPC requirements and, therefore, the RFT requirements.

NOTE: When training or evaluating the ability of a pilot to control an aircraft on instruments and to navigate without reference to outside cues, the inspector, check pilot, or instructor must restrict the pilot's vision to the aircraft's instrument panel. This can only be ensured with the use of an appropriate view-limiting device. When an FSTD is not available for training or checking, the dilemma is how to safely perform these maneuvers under the "see and be seen" requirements of visual meteorological conditions (VMC) flight and still be able to accurately assess the pilot's ability to control and navigate an aircraft without reference to outside cues. On one hand, the use of a view-limiting device must not restrict the ability of the check pilot or other observers to safely clear the area and conduct outside vigilance during all maneuvers. On the other hand, the check pilot must be certain that the pilot is not using any outside references. In final analysis, the check or training should not be conducted if the requirements of safety and test integrity cannot be met (see Volume 5, Chapter 3, Section 4, paragraph 5-887).

2) Part 121 RFT. Part 121 RFT is training that must be conducted for PICs once every 6 months and for SICs once every 12 months, and must include training on the maneuvers and procedures listed in part 121 appendix F. Levels B, C, and D FFSs qualify for "training and checking to proficiency" on all the maneuvers and procedures required for RFT by part 121. RFT can always be conducted in an airplane. A proficiency check (§ 121.441) may be substituted for RFT.

3) Part 121 Level A RFT. Level A RFT is conducted in a level A FFS. Level A RFT is referenced in several different ways in part 121. The following are examples: "A course of training in an airplane simulator" (§ 121.409(b)); "flight training program approved by the administrator" (§ 121.427(d)(1)(ii)); and "the approved simulator course of training" (§§ 121.433(c)(2) and 121.441(a)). For the purpose of standardization and mutual understanding, the term "level A recurrent flight training" or "level A RFT" should be used in reference to this type of training when it is conducted entirely in a level A FFS. Level A FFSs are not qualified to be used for "training to proficiency" on certain maneuvers listed in appendix F (such as takeoffs and landings). However, level A FFSs can be used for training and practice on the procedures used to accomplish these maneuvers. These maneuvers are annotated by a "C" in the RFT maneuvers and procedures table (Table 3-64). Level A RFT may be substituted for alternate

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periods of RFT (required by § 121.433(c)(2)) or for alternate proficiency checks (required by § 121.441(e)), provided the person being trained is evaluated by a check pilot during the subsequent proficiency check (for PICs, once each 12 months; for SICs once each 24 months). The proficiency check may be conducted in a level A FFS, provided the person being checked is evaluated during the conduct of two landings on the line (or other check) by a check pilot (or, for SICs, by a line PIC). The entire proficiency check (without the landings on the line requirement) may be conducted in a level B, C, or D FFS.

B. Training Emphasis Considerations. Operators should develop RFT and level A RFT curriculum segments which serve to maximize training on certain maneuvers and procedures. A pilot's competency to function in his assigned duty position is evaluated during an annual proficiency check (or a competency check). During that check, at least the events required by part 121 appendix F (for part 121 operators) and any of the events required for the original issuance of the particular pilot certificate involved (for part 135 operators) must be accomplished. The RFT curriculum outline should address all the required training events listed in Table 3-64. However, during RFT or level A RFT, specific training on every event is unnecessary unless it is needed for maintaining pilot proficiency on particular events. It is national direction and guidance that, during periods of RFT or level A RFT, training emphasis should be on those events or other maneuvers or procedures not normally encountered during routine line operations, such as abnormal or emergency procedure training or wind shear training. Additionally, training on new or revised maneuvers or procedures, new equipment, or other similar areas is ideally suited for periods of RFT or level A RFT. Time should be allotted to conduct training in maneuvers or procedures the pilot wishes to practice, or in certain operational areas in which deficiencies have surfaced during proficiency or line checks, indicating a need for additional training.

NOTE: Even though all of the maneuvers and procedures may not be accomplished during RFT or level A RFT, the RFT curriculum segment outline should address all of the required training events listed in Table 3-64.

Table 3-64. Flight Training PIC/SIC Recurrent and Requalification Flight Training—Transport and Commuter Category Airplanes (Front Side)

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
PREPARATION	Visual Inspection (Use of pictorial display authorized)									X
	Pretaxi Procedures		X	X		X	X	X	X	X
	Performance Limitations	A	A	X		X	X	X	X	X
SURFACE OPERATION	Pushback	A	A	X		X	X	X	X	X
	[ ] Powerback Taxi					X	X	X	X	X
	Starting			X		X	X	X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
	Taxi					C	C	X	X	X
	Pretakeoff Checks	A	A	X		X	X	X	X	X
TAKEOFF	Normal M					C	C	X	X	X
	Crosswind					C	C	X	X	X
	Rejected M			X		X	X	X	X	X
	Power Failure V_1 M					X	X	X	X	X
	Powerplant Failure During Second Segment #					X	X	X	X	X
	[ ] Lower than Standard Minimum					X	X	X	X	X
CLIMB	Normal			X		X	X	X	X	X
	One Engine Inoperative During Climb to En Route Altitude #					X	X	X	X	X
EN ROUTE	Steep Turns PIC			X		X	X	X	X	X
	Stall Prevention (Approaches to Stalls): M (Takeoff Config.) (En Route Config.) (Landing Config.) X* The approved recovery procedure must be initiated at the first indication of an impending stall (buffet, stick shaker, aural warning).			X*		X	X	X	X	X
	Inflight Powerplant Shutdown	A	A	X		X	X	X	X	X
	Inflight Powerplant Restart		A	X		X	X	X	X	X
	High-Speed Handling Characteristics					X	X	X	X	X
DESCENT	Normal			X		X	X	X	X	X
	Maximum Rate			X		X	X	X	X	X
APPROACHES	VFR Procedures M Visual Approach					C	X	X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
	With 50 percent Loss of Power on One side PIC M (2 engines inoperative on 3-engine airplanes)					X	X	X	X	X
	With Slat/Flap Malfunction PIC M					X	X	X	X	X
	IFR Precision Approaches M ILS/Normal					X	X	X	X	X
	ILS/One Engine Inoperative					C	X	X	X	X
	[ ] PAR/Normal			X		X	X	X	X	X
	[ ] PAR/One Engine Inoperative #					X	X	X	X	X
	IFR Nonprecision Approaches M NDB/Normal			A*		X	X	X	X	X
	VOR/Normal A* At least one Nonprecision approach must be accomplished in a FFS or the aircraft			A*		X	X	X	X	X
	Nonprecision Approach One-Engine Inoperative #					X	X	X	X	X
	[ ] LOC Backcourse Procedures		A	X		X	X	X	X	X
	[ ] SDF/LDA Procedures		A	X		X	X	X	X	X
	[ ] ASR Procedures		A	X		X	X	X	X	X
	[ ] RNAV Procedures		A	X		X	X	X	X	X
	[ ] LORAN C Procedures		A	X		X	X	X	X	X
	[ ] Circling Approach M (FFS must be qualified for training/checking on the circling maneuver)					X	X	X	X	X

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Table 3-64. Flight Training PIC/SIC Recurrent and Requalification Flight Training—Transport and Commuter Category Airplanes (Back Side)

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
APPROACHES (Cont'd)	Missing Approaches M From Precision Approach					X	X	X	X	X
	From Nonprecision Approach					X	X	X	X	X
	With Powerplant Failure					X	X	X	X	X
LANDINGS	Normal					C	X	X	X	X
	With Pitch Mistrim PIC					C	X	X	X	X
	From Precision Instrument Approach					X	X	X	X	X
	From Precision Instrument Approach With Most Critical Engine Inoperative					X	X	X	X	X
	With 50 percent Loss of Power on One Side PIC (2 engines inoperative on 3-engine airplanes)					X	X	X	X	X
	Crosswind					A	X	X	X	X
AFTER LANDING	Parking #					X	X	X	X	X
	Emergency Evacuation #			X		X	X	X	X	X
OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE	Holding			X		X	X	X	X	X
	Ice Accumulation on Airframe #					X	X	X	X	X
	Air Hazard Avoidance #					A	X	X	X	X
	Wind Shear/Microburst #					X	X	X	X	
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE - Normal - Abnormal - Alternate	Pneumatic/Pressurization	A	A	X		X	X	X	X	X
	Air Conditioning	A	A	X		X	X	X	X	X
	Fuel and Oil	A	A	X		X	X	X	X	X
	Electrical	A	A	X		X	X	X	X	X
	Hydraulic	A	A	X		X	X	X	X	X
	Flight Controls	A	A	X		X	X	X	X	X
	Anti-Icing and Deicing Systems			X		X	X	X	X	X
	Autopilot			X		X	X	X	X	X
	Flight Management Guidance Systems and/or Automatic or Other Approach and Landing Aids		A	X		X	X	X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
	Stall Warning Devices, Stall Avoidance Devices, and Stability Augmentation Systems			X		X	X	X	X	X
	Airborne Weather Radar	A	A	X		X	X	X	X	X
	Flight Instrument System Malfunction	A	A	X		X	X	X	X	X
	Communications Equipment	A	A	X		X	X	X	X	X
	Navigation Systems	A	A	X		X	X	X	X	X
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE - Emergency	Aircraft Fires	A	A	X		X	X	X	X	X
	Smoke Control	A	A	X		X	X	X	X	X
	Powerplant Malfunctions	A	A	X		X	X	X	X	X
	Fuel Jettison	A	A	X		X	X	X	X	X
	Electrical, Hydraulic, Pneumatic Systems	A	A	X		X	X	X	X	X
	Flight Control Systems Malfunction	A	A	X		X	X	X	X	X
	Landing Gear and Flap Systems Malfunction	A	A	X		X	X	X	X	X

3-1247 PIC/SIC RELATED AIRCRAFT DIFFERENCES FLIGHT TRAINING—TRANSPORT CATEGORY AIRPLANES. Under § 121.418(c), a POI is authorized to approve a modification to the flight training maneuver and procedure requirements of § 121.424 for designated related aircraft. The flight training must be conducted in the aircraft or minimum level of FSTD, as specified in the FSB report for each maneuver and procedure. See Volume 3, Chapter 19, Section 12, for additional information regarding related aircraft designation and related aircraft differences training.

3-1248 FE INITIAL EQUIPMENT, INITIAL NEW-HIRE, INITIAL EQUIPMENT, TRANSITION, AND RFT—TRANSPORT CATEGORY AIRPLANES.

A. Training Required for Initial Issuance of an FE Certificate. All applicants for an FE certificate with the initial class rating must satisfy one of the seven aeronautical experience and/or training requirements specified in 14 CFR part 63, § 63.37.

1) Section 63.37(b)(1), (2), (3), and (4) require, in addition to other specific requirements, that an applicant receive 5 hours of flight training in the duties of an FE. This training must be accomplished in an airplane in flight. There are no provisions for the substitution of FSTDs for any part of these 5 hours of flight training. These 5 hours of flight training may not be acquired during revenue operations conducted under part 121.

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2) Section 63.37(b)(5), (6), and (7) are alternative methods for satisfying the aeronautical experience and/or training requirements of part 63. An applicant who meets the aeronautical experience requirements in subparagraph (b)(5) or (b)(6) is eligible for an initial FE certification check without any flight training (including the 5-hour airplane training requirement). Section 63.37(b)(7) allows the successful completion of an approved FE ground and flight course of instruction, as provided in part 63 appendix C, to satisfy the aeronautical experience requirements. If a student for initial issuance of an FE certificate uses the training received from a part 121 operator to meet the aeronautical experience requirements of § 63.37, that operator's FE training course must be approved under §§ 63.43, 121.419, and 121.425.

NOTE: When an operator's FE training curriculum meets the requirements of this order and is approved under part 121, it also meets the requirements of part 63. The operator may obtain approval of that curriculum under § 63.43 by submitting a letter requesting approval in accordance with the provisions of that regulation. A POI must approve or deny the request by letter.

3) Training under part 63 appendix C includes at least 10 hours of flight instruction. Appendix C is the only section in part 63 that permits the use of FSTDs. In accordance with part 63 appendix C (a)(3)(iv), an operator may reduce the flight training requirement to 5 hours of actual airplane time by substituting time in FSTDs for a total of at least 10 hours of flight training. It is important, however, to note that FFSs may be substituted on a two-to-one basis, and FTDs on a three-to-one basis, for actual airplane time. For example, for an operator to be permitted a reduction to 5 hours of airplane training, that operator must provide at least 10 hours of FFS time (two-to-one) or 15 hours of FTD time (three-to-one), or any other combination thereof which, when added to the 5 hours of airplane training, meets the 10-hour appendix C flight training requirement.

4) Part 63 appendix C (a)(iv)(b) permits an FE student holding at least a commercial pilot certificate with an instrument rating to substitute either FFS time or a combination of FSTD time for up to the full 10 hours of required airplane flight time. The two-to-one and three-to-one provisions still apply with an additional restriction that a maximum of 15 hours FTD time may be substituted. For example, an operator may substitute 20 hours of FFS time (2:1 = 10 hours of airplane flight training) for the total 10-hour appendix C airplane flight training requirement. Another example is an operator may substitute 10 hours of FFS time (2:1 = 5 hours of airplane flight training) plus a maximum of 15 hours of FTD time (3:1 = 5 hours of airplane flight training for meeting the total 10-hour appendix C airplane flight training requirement. The purpose of the 15-hour FTD limitation is to ensure a certain amount of the flight training will include a full crew complement. It is important to note that substitution of FSTDs for airplane training is only permitted under a part 63 appendix C program (as discussed in subparagraphs A3) and 4) above). This provision should not be confused with § 63.37(b)(4), which permits a student holding a commercial pilot certificate with an instrument rating and who has received at least 5 hours of airplane flight training (no FSTD substitution permitted) to qualify for an FE check. Therefore, if an applicant with a commercial pilot certificate and instrument rating attends a part 63 appendix C school, the applicant can use § 63.37(b)(7) to satisfy the experience requirement and can take advantage of the FSTD substitution provisions.

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B. FE Transition Flight Training. An FE employed by a part 121 operator who transitions from one airplane to another must complete a transition flight training curriculum segment approved under part 121. This training is not approved or conducted within the context of part 63. The use of FSTDs or aircraft for accomplishing training events must be proposed by the operator and approved by the POI.

NOTE: FE applicants who qualify under the Airlines for America (A4A) exemption number 4901 may receive the normal procedures portion of the initial certification check in a "flight engineer simulator." An FE simulator, as defined in that exemption, is the equivalent of a level 6 FTD or higher, or any level FFS. The definition does not require motion for visual systems. This exemption permits compliance with § 63.39(b)(2), which requires the "normal" procedures portion of the certification check to be accomplished in the FE simulator rather than in an actual aircraft. For further explanation, see Volume 5, Chapter 4, Section 2, paragraph 5-1009.

C. Required Maneuvers and Procedures. Training in the maneuvers and procedures in Table 3-65, Flight Training FE Initial Equipment, Initial New-Hire, Transition, and Recurrent Flight Training, must be conducted for satisfactory completion of initial new-hire, initial equipment, and transition or recurrent training for previously certificated FEs and for the initial certification of FEs. Training for these maneuvers and procedures must include training in normal, abnormal, alternate, and emergency procedures, as appropriate.

D. Training Emphasis Considerations. A POI should ensure that the operator's FE flight training emphasizes the appropriate areas for these categories of training:

1) For initial new-hire training, emphasis should be on areas involving crew concept, duties, responsibilities, systems integration concepts, and company procedures.

2) For transition and initial equipment training, emphasis should be on the systems and procedures that pertain to the specific aircraft type.

3) For recurrent training, emphasis should be on new or revised maneuvers or procedures that are pertinent to line operations.

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Table 3-65. Flight Training FE Initial Equipment, Initial New-Hire, Transition, and Recurrent Flight Training

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
PREPARATION	Airplane Preflight • Logbook Procedures • Safety Checks (PICTORIAL DISPLAY) • Cabin/Interior • Exterior Walkaround M • Servicing/Deicing • Use of Oxygen	X	X	X		X	X	X	X	X
GROUND OPERATIONS	Performance Data • T/O LND Data • Airport Analysis • Weight and Balance (W&B)	X	X	X		X	X	X	X	X
	Use of Checklist • Panel Setup	X	X	X		X	X	X	X	X
	Starting • External PWR • External Air • APU	X	X	X		X	X	X	X	X
	Communications • Station Procedures • ACARS	X	X	X		X	X	X	X	X
	Taxi	X	X	X		X	X	X	X	X
TAKEOFF	Powerplant Control		X	X		X	X	X	X	X
	Flaps/Landing Gear		X	X		X	X	X	X	X
	Fuel Management	X	X	X		X	X	X	X	X
	Other Systems Operation	X	X	X		X	X	X	X	X
	Aircraft Performance	X	X	X		X	X	X	X	X
	Checklist Completion	X	X	X		X	X	X	X	X
CLIMB	Powerplant Control		X	X		X	X	X	X	X
	Fuel Management	X	X	X		X	X	X	X	X
	Pressurization		X	X		X	X	X	X	X
	Electrical System	X	X	X		X	X	X	X	X
	Air Conditioning		X	X		X	X	X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
	Flight Controls	X	X	X		X	X	X	X	X
	Other Systems	X	X	X		X	X	X	X	X
EN ROUTE	Powerplant Operation		X	X		X	X	X	X	X
	Fuel Management	X	X	X		X	X	X	X	X
	Performance Management		X	X		X	X	X	X	X
	High Altitude Performance		X	X		X	X	X	X	X
	Other Systems Operation	X	X	X		X	X	X	X	X
DESCENT	Powerplant Operation		X	X		X	X	X	X	X
	Other Systems Operations	X	X	X		X	X	X	X	X
	Performance Management	X	X	X		X	X	X	X	X
APPROACH	Landing Data	X	X	X		X	X	X	X	X
	Landing Gear Operation	X	X	X		X	X	X	X	X
	Flat/Slat/Spoiler Operation		X	X		X	X	X	X	X
	Approach Monitoring M		X	X		X	X	X	X	X
LANDINGS	Powerplant Operation		X	X		X	X	X	X	X
	Aircraft Configuration		X	X		X	X	X	X	X
	System Operation	X	X	X		X	X	X	X	X
	Emergency Evacuation			X		X	X	X	X	X
PROCEDURES DURING ANY GROUND OR AIRBORNE PHASE - Normal - Abnormal - Alternate - Emergency	Flight Deck Equipment			X		X	X	X	X	X
	Flap/Slats/Gear		X	X		X	X	X	X	X
	Powerplant		X	X		X	X	X	X	X
	Pressurization		X	X		X	X	X	X	X
	Pneumatic	X	X	X		X	X	X	X	X
	Air Conditioning	X	X	X		X	X	X	X	X
	Fuel and Oil	X	X	X		X	X	X	X	X
	Electrical	X	X	X		X	X	X	X	X
	Hydraulic	X	X	X		X	X	X	X	X
	Flight Controls		X	X		X	X	X	X	X
	Anti-Icing and Deicing		X	X		X	X	X	X	X

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3-1249 PIC/SIC FLIGHT TRAINING (ALL TRAINING CATEGORIES)—MULTIENGINE GENERAL PURPOSE AIRPLANES.

A. Required Maneuvers and Procedures. Training in the maneuvers and procedures Table 3-66, Flight Training PIC/SIC Training (All Training Categories)—Multiengine General Purpose Airplanes, must be conducted for satisfactory completion of each category of flight training. Those training events annotated with an "SEA" symbol are only required for those operators engaged in seaplane operations.

1) PICs must complete training in each training event in this table.

2) SICs must complete training in each training event in this table. SIC training in the following events does not require manipulation of the primary aircraft controls but should emphasize duties of the PM:

- Approach and landing with pitch mistrim,
- Approach and landing with 50 percent loss of power on one side,
- Approach and landing with flap/slat malfunction, and
- Steep turns.

B. Training Emphasis Considerations. A POI should ensure that the operator's flight training emphasizes the appropriate areas for these categories of training:

- For initial new-hire training, emphasis should be on specific company procedures.
- For transition training, emphasis should be on the handling characteristics and the maneuvers and procedures pertinent to the specific aircraft type.
- For upgrade training, emphasis should be on the specific duties and responsibilities pertinent to the PIC position.
- For recurrent training, emphasis should be on new or revised maneuvers or procedures pertinent to line operations.

C. Part 135 RFT. RFT must be conducted periodically for both PICs and SICs, at least once every 12 months. Section 135.351(c) specifies that RFT for pilots must include at least "...flight training in the maneuvers or procedures in this subpart, except that satisfactory completion of the check required by § 135.293" (the competency check) "may be substituted for recurrent flight training." The competency check may include any of the maneuvers and procedures currently required for the original issuance of the particular pilot certificate, for the operations authorized, and appropriate for the category, class, and type of aircraft involved. The IPC, as specified in § 135.293(c), may be substituted for the competency check. Additionally, there are no provisions in part 135 which allow RFT to substitute for required checks or tests. There are no training appendices in part 135 containing lists of the required maneuvers and procedures for flight training or checking. Training on the events in the applicable tables in this section, however, does meet the part 135 competency and IPC requirements and, therefore, the RFT requirements.

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Table 3-66. Flight Training PIC/SIC Training (All Training Categories)—Multiengine General Purpose Airplanes

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
PREPARATION	Visual Inspection									X
	Pretaxi Procedures		X	X		X	X	X	X	X
	Performance Limitations	X	X	X		X	X	X	X	X
SURFACE OPERATION	Flight Deck Management			X		X	X	X	X	X
	Securing Cargo									X
	Starting	X	X	X		X	X	X	X	X
	Taxi	X				X	X	X	X	X
	[ ] Powerback Taxi						X	X	X	X
	Steep Turns SEA									X
	Sailing SEA									X
	Pretakeoff Checks			X		X	X	X	X	X
TAKEOFF	Normal M						X	X	X	X
	Crosswind						X	X	X	X
	Short/Soft Field M								X	X
	Glassy/Rough Water SEA								X	X
	V_{MC} Demonstration and Recovery					X	X	X	X	X
	Powerplant Failure Below V_{MC} (Rejected)			X		X	X	X	X	X
	Powerplant Failure After V_{MC}					X	X	X	X	X
	[ ] Lower than Standard Minimum					X	X	X	X	X
CLIMB	Normal			X		X	X	X	X	X
	One Engine Inoperative #					X	X	X	X	X
EN ROUTE	Steep Turns			X		X	X	X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
	Stall Prevention (Approaches to Stalls): M (Takeoff Config.) (En Route Config.) (Landing Config.) X* Only if stall warning/stall avoidance provides first stall indication			X*		X	X	X	X	X
	Powerplant Shutdown and Restart			X		X	X	X	X	X
	Slow Speed Handling Characteristics			X		X	X	X	X	X
	With a Powerplant Inoperative			X		X	X	X	X	X
DESCENT	Normal			X		X	X	X	X	X
	Maximum Rate			X		X	X	X	X	X
APPROACHES	VFR Procedures M Normal						X	X	X	X
	With 50 percent Loss of Power on One side PIC M					X	X	X	X	X
	With Slat/Flap Malfunction PIC M					X	X	X	X	X
	IFR Precision Approaches M ILS/Normal						X	X	X	X
	ILS/One-Engine Inoperative						X	X	X	X
	[ ] PAR/Normal						X	X	X	X
	[ ] PAR/One-Engine Inoperative #						X	X	X	X
	IFR Nonprecision Approaches M NDB/Normal			A*		X	X	X	X	X
	VOR/Normal A* At least one Nonprecision approach must be accomplished in a FFS or the aircraft			A*		X	X	X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
	Nonprecision Approach One-Engine Inoperative #					X	X	X	X	X
	[ ] LOC Backcourse Procedures		A	X		X	X	X	X	X
	[ ] SDF/LDA Procedures		A	X		X	X	X	X	X
	[ ] ASR Procedures		A	X		X	X	X	X	X
	[ ] RNAV Procedures		A	X		X	X	X	X	X
	[ ] LORAN C Procedures		A	X		X	X	X	X	X
	[ ] Circling Approach M (FFS must be qualified for training/checking on the circling maneuver)							X	X	X
	Missing Approaches M From Precision Approach					X	X	X	X	X
	From Nonprecision Approach					X	X	X	X	X
	NOTE: At least one MAP must be a complete approved procedure.									
	With Powerplant Failure					X	X	X	X	X
LANDINGS	Normal							X	X	X
	With Pitch Mistrim PIC					X	X	X	X	X
	From Precision Instrument Approach					X	X	X	X	X
	From Precision Instrument Approach With Most Critical Engine Inoperative					X	X	X	X	X
	With 50 percent Loss of Power on One Side PIC					X	X	X	X	X
	Crosswind							X	X	X
	Short/Soft Field							X	X	X
	Glassy/Rough Water SEA							X	X	X
	With Manual Reversion/Degraded Control Augmentation					X	X	X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
AFTER LANDING	Docking, Mooring and Ramping SEA								X	X
	Parking #						X	X	X	X
	Emergency Evacuation #			X		X	X	X	X	X
OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE	Holding			X		X	X	X	X	X
	Ice Accumulation on Airframe #					X	X	X	X	X
	Air Hazard Avoidance #					A	A	X	X	X
	Wind Shear/Microburst #					X	X	X	X	
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE - Normal - Abnormal - Alternate	Pneumatic/Pressurization	A	A	X		X	X	X	X	X
	Air Conditioning	A	A	X		X	X	X	X	X
	Fuel and Oil	A	A	X		X	X	X	X	X
	Electrical	A	A	X		X	X	X	X	X
	Hydraulic	A		X		X	X	X	X	X
	Flight Controls	A		X		X	X	X	X	X
	Anti-Icing and Deicing Systems			X		X	X	X	X	X
	Autopilot		A	X		X	X	X	X	X
	Flight Management Guidance Systems and/or Automatic or Other Approach and Landing Aids		A	X		X	X	X	X	X
	Stall Warning Devices, Stall Avoidance Devices, and Stability Augmentation Systems			X		X	X	X	X	X
	Airborne Weather Radar	A	A	X		X	X	X	X	X
	Flight Instrument System Malfunction		A	X		X	X	X	X	X
	Communications Equipment	A	A	X		X	X	X	X	X
	Navigation Systems	A	A	X		X	X	X	X	X
SYSTEMS PROCEDURES	Aircraft Fires	A	A	X		X	X	X	X	X
	Smoke Control	A	A	X		X	X	X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
TRAINING DURING ANY PHASE - Emergency	Powerplant Failure/Fire	A	A	X		X	X	X	X	X
	Electrical, Hydraulic, Pneumatic Systems	A	A	X		X	X	X	X	X
	Flight Control Systems Malfunction	A	A	X		X	X	X	X	X
	Landing Gear and Flap Systems Malfunction	A	A	X		X	X	X	X	X
	Air Hazard Avoidance #					X	X	X	X	X
	Wind Shear/Microburst M					X	X	X	X	X

3-1250 PIC/SIC FLIGHT TRAINING (ALL TRAINING CATEGORIES)—SINGLE-ENGINE AIRPLANES.

A. Required Maneuvers and Procedures. Training in the maneuvers and procedures in Table 3-67, Flight Training PIC/SIC Flight Training (All Training Categories)—Single-Engine Airplanes, must be conducted for satisfactory completion of each category of flight training. Those training events annotated with an “SEA” symbol are only required for operators engaged in seaplane operations.

1) PICs must complete training in each training event in this table.

2) SICs must complete training in each training event in this table. SIC training in the following events does not require manipulation of the primary aircraft controls but should emphasize duties of the PM:

- Approach and landing with pitch mistrim, and
- Steep turns.

B. Training Emphasis Considerations. A POI should ensure that the operator’s flight training emphasizes the appropriate areas for these categories of training:

- For initial new-hire training, emphasis should be on specific company procedures;
- For transition training, emphasis should be on the handling characteristics and the maneuvers and procedures pertinent to the specific aircraft type;
- For upgrade training, emphasis should be on the specific duties and responsibilities pertinent to the PIC position; and
- For recurrent training, emphasis should be on new or required maneuvers or procedures pertinent to line operations.

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C. Part 135 RFT. RFT must be conducted periodically for both PICs and SICs, at least once every 12 months. Section 135.351(c) specifies that RFT for pilots must include at least "...flight training in the maneuvers or procedures in this subpart, except that satisfactory completion of the check required by § 135.293" (the competency check) "may be substituted for recurrent flight training." The competency check may include any of the maneuvers and procedures currently required for the original issuance of the particular pilot certificate, for the operations authorized, and appropriate to the category, class, and type of aircraft involved. The IPC, as specified in § 135.293(c), may be substituted for the competency check. Additionally, there are no provisions in part 135 which allow RFT to substitute for required checks or tests. There are no training appendices in part 135 containing lists of the required maneuvers and procedures for flight training or checking. Training on the events in the applicable tables in this section, however, does meet the part 135 competency and IPC requirements and, therefore, the RFT requirements.

Table 3-67. Flight Training PIC/SIC Flight Training (All Training Categories)—Single-Engine Airplanes

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
PREPARATION	Visual Inspection									X
	Pretaxi Procedures		X	X		X	X	X	X	X
	Performance Limitations	X	X	X		X	X	X	X	X
SURFACE OPERATION	Flight Deck Management			X		X	X	X	X	X
	Securing Cargo									X
	Starting	X	X	X		X	X	X	X	X
	Taxi					X	X	X	X	X
	[ ] Powerback Taxi						X	X	X	X
	Steep Turns SEA									X
	Sailing SEA									X
	Pretakeoff Checks			X		X	X	X	X	X
TAKEOFF	Normal M						X	X	X	X
	Crosswind						X	X	X	X
	Rejected M			X		X	X	X	X	X
	Short/Soft Field M								X	X
	Glassy/Rough Water SEA								X	X
CLIMB	Normal			X		X	X	X	X	X
	One-engine Inoperative #					X	X	X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
EN ROUTE	Steep Turns			X		X	X	X	X	X
	Stall Prevention (Approaches to Stalls): M (Takeoff Config.) (En Route Config.) (Landing Config.) X* Only if stall warning/stall avoidance provides first stall indication			X*		X	X	X	X	X
	Powerplant Shutdown and Restart			X		X	X	X	X	
	Slow Speed Handling Characteristics			X		X	X	X	X	X
DESCENT	Normal			X		X	X	X	X	X
	Maximum Rate			X		X	X	X	X	X
APPROACHES	VFR Procedures M Normal Approach						X	X	X	X
	Accuracy						X	X	X	X
	IFR Precision Approaches M ILS						X	X	X	X
	[ ] PAR						X	X	X	X
	IFR Nonprecision Approaches M NDB			A*		X	X	X	X	X
	VOR/Normal A* At least one Nonprecision approach must be accomplished in a FFS or the aircraft			A*		X	X	X	X	X
	[ ] LOC Backcourse Procedures		A	X		X	X	X	X	X
	[ ] SDF/LDA Procedures		A	X		X	X	X	X	X
	[ ] TACAN Procedures		A	X		X	X	X	X	X
	[ ] ASR Procedures		A	X		X	X	X	X	X
	[ ] RNAV Procedures		A	X		X	X	X	X	X
	[ ] LORAN C Procedures		A	X		X	X	X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
	[ ] Circling Approach M (FFS must be qualified for training/checking on the circling maneuver)							X	X	X
	MISSED APPROACHES M From Precision Approach					X	X	X	X	X
	From Nonprecision Approach					X	X	X	X	X
	NOTE: At least one MAP must be a complete approved procedure.									
LANDINGS	Normal							X	X	X
	Spot							X	X	X
	With Simulated Powerplant Failure							X	X	X
	With Pitch Mistrim PIC					X	X	X	X	X
	From Precision Instrument Approach							X	X	X
	Crosswind							X	X	X
	Short/Soft Field								X	X
	Glassy/Rough Water SEA								X	X
AFTER LANDING	Docking, Mooring and Ramping SEA								X	X
	Parking #						X	X	X	X
	Emergency Evacuation #			X		X	X	X	X	X
OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE	Holding			X		X	X	X	X	X
	Ice Accumulation on Airframe #					X	X	X	X	X
	Air Hazard Avoidance #					X	X	X	X	X
	Wind Shear/Microburst #					X	X	X	X	
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE	Pneumatic/Pressurization	A	A	X		X	X	X	X	X
	Air Conditioning	A	A	X		X	X	X	X	X
	Fuel and Oil	A	A	X		X	X	X	X	X
	Electrical	A	A	X		X	X	X	X	X

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
- Normal - Abnormal - Alternate	Hydraulic	A	A	X		X	X	X	X	X
	Flight Controls	A	A	X		X	X	X	X	X
	Anti-Icing and Deicing Systems			X		X	X	X	X	X
	Autopilot		A	X		X	X	X	X	X
	Flight Management Guidance Systems and/or Automatic or Other Approach and Landing Aids		A	X		X	X	X	X	X
	Stall Warning Devices, Stall Avoidance Devices			X		X	X	X	X	X
	Airborne Weather Radar	A	A	X		X	X	X	X	X
	Flight Instrument System Malfunction		A	X		X	X	X	X	X
	Communications Equipment	A	A	X		X	X	X	X	X
	Navigation Systems	A	A	X		X	X	X	X	X
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE - Emergency	Aircraft Fires	A	A	X		X	X	X	X	X
	Smoke Control	A	A	X		X	X	X	X	X
	Powerplant Malfunctions	A	A	X		X	X	X	X	X
	Electrical, Hydraulic, Pneumatic Systems	A	A	X		X	X	X	X	X
	Flight Control Systems Malfunction	A	A	X		X	X	X	X	X
	Landing Gear and Flap Systems Malfunction	A	A	X		X	X	X	X	X

3-1251 PIC/SIC FLIGHT TRAINING (ALL TRAINING CATEGORIES)—HELICOPTERS.

A. Required Maneuvers and Procedures. Training in the maneuvers and procedures in Table 3-68 must be conducted for satisfactory completion of each category of flight training. Those training events annotated with an “SEA” symbol are required only for an operator engaged in water operations.

1) PICs must complete training in each training event in this table.

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2) SICs must complete training in each training event in this table. SIC training in the following events does not require manipulation of the primary aircraft controls but should emphasize the duties of the PM:

- Category "A" vertical and/or edge takeoffs and landings, and
- Approach and landing with anti-torque malfunctions.

NOTE: The levels of FSTDs to be used for the training events listed in Table 3-68 are currently under development.

B. Training Emphasis Considerations. A POI should ensure that the operator's flight training emphasizes the appropriate areas for these categories of training:

- For initial new-hire training, emphasis should be on specific company procedures;
- For transition training, emphasis should be on the handling characteristics and the maneuvers and procedures pertinent to the specific aircraft type;
- For upgrade training, emphasis should be on the specific duties and responsibilities pertinent to the PIC position;
- For recurrent training, emphasis should be on new or revised maneuvers or procedures pertinent to line operations;
- For all pilot training programs, emphasis should be on avoidance and recovery from inadvertent entry into instrument meteorological conditions (IMC), including the loss of adequate surface or horizontal reference in visual flight rules (VFR) conditions, and the application of the operator's controlled flight into terrain (CFIT) avoidance program, whiteout, brownout, flat-light; and
- For all training programs, emphasis on operations in various environments, such as mountainous areas, deserts, overwater, and in desolate areas.

C. Part 135 RFT. RFT must be conducted periodically for both PICs and SICs, at least once every 12 months. Section 135.351(c) specifies that RFT for pilots must include at least "...flight training in the maneuvers or procedures in this subpart, except that satisfactory completion of the check required by § 135.293" (the competency check) "may be substituted for recurrent flight training." The competency check may include any of the maneuvers and procedures currently required for the original issuance of the particular pilot certificate, for the operations authorized, and appropriate to the category, class, and type of aircraft involved. The IPC, as specified in § 135.293(c), may be substituted for the competency check. Additionally, there are no provisions in part 135 listing the required maneuvers and procedures for flight training or checking. Training on the events in the applicable tables in this section, however, does meet the part 135 competency and IPC requirements and, therefore, the RFT requirements.

D. Helicopter FSTD Usage. The criteria for the use of helicopter FSTDs are currently under development. Several helicopter FSTDs have been individually approved using interim criteria. These FSTDs may continue to be used in part 135 training and checking activities in accordance with specific approvals currently in effect.

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3-1252 INADVERTENT INSTRUMENT METEOROLOGICAL CONDITIONS (IIMC) TRAINING AND CHECKING. All helicopter pilots operating under part 135 must be trained and checked on procedures for the avoidance and recovery from IIMC. Inspectors will evaluate the certificate holder's operational procedures for recovery from IIMC and ensure these procedures are incorporated into the certificate holder's initial and recurrent training program(s). Training and checking should emphasize the identification of circumstances likely to lead to IIMC encounters and encourage the pilot to abandon a planned flight path or route to avoid continued VFR flight into deteriorating conditions.

A. General. After April 22, 2015, each competency check given in a rotorcraft must include a demonstration of the pilot's ability to maneuver the rotorcraft solely by reference to instruments. The check must determine the pilot's ability to safely maneuver the rotorcraft into VMC following an encounter with IIMC. For competency checks in non-IFR-certified rotorcraft, the pilot must perform such maneuvers as are appropriate to the rotorcraft's installed equipment, the certificate holder's OpSpecs, and the operating environment.

B. Approving Methods. POIs should approve methods appropriate to the aircraft, equipment, and facilities available. POIs should consider the operator's hiring standards and practices (such as requiring a helicopter instrument rating for VFR pilots) in evaluating training and checking modules. POIs shall ensure that an operator's pilots accomplish these training and checking events in the aircraft in which the pilot will be qualified for revenue operations (or in an appropriately equipped FSTD). The events should reflect a realistic course of action the pilot might take to escape from an encounter with IIMC.

C. General Operations Manual (GOM). In addition to training, the operator should establish a loss of control (LOC) IIMC avoidance policy that supports the emergency authority of the pilot to divert, make a precautionary landing, or make an emergency transition to IFR.

1) The Inspector should evaluate the operator's LOC/IIMC avoidance plan of action as a component of the GOM. This plan should describe pilot, medical personnel, and Operations Control Specialist (OCS) or Communications Specialist duties, responsibilities, and authorities in the avoidance and recovery from IIMC encounters. This plan should be adaptable to each facility from which the certificate holder conducts operations. The plan of action should include a checklist for emergency IFR transitions and integrate all resources to support the pilot's decisionmaking and performance of the appropriate avoidance and recovery actions. For example, though it is expected that the pilot is fully trained and qualified to maneuver the helicopter while managing communications and navigation tasks, the plan may include the optional inclusion of onboard medical personnel assistance to the pilot and as applicable, OCS or Communications Specialist assistance during an IIMC emergency situation.

2) Medical personnel may assist by reading frequencies, courses, and altitudes for the pilot, allowing a higher level of pilot concentration on controlling the aircraft during the VFR/IFR transition. This assistance during an emergency should not interfere with patient care. In this case, the operator should provide appropriate training and aeronautical information reference materials for the medical personnel.

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D. IIMC Training. All pilots should be trained in basic instrument flying skills to recover from IIMC, including those authorized to conduct IFR operations under part H OpSpecs. Training should be directed at unplanned transitions from VFR flight to emergency IFR operations, as this involves a different set of pilot actions, including navigation and operational procedures, interaction with air traffic control (ATC), and CRM. IIMC training should include visual cues and unusual conditions, which should prompt pilot action to avoid an IIMC encounter and pilot reaction plans to divert, land, or initiate an emergency transition to IFR as appropriate to the situation.

E. Non-IFR-Certified Aircraft. In the absence of an IFR-certified helicopter, training and checking should include maneuvers appropriate to the installed equipment, the certificate holder's OpSpecs, and the operating environment. Training and checking for all pilots, whether helicopter instrument rated or not, should include attitude instrument flying, recovery from unusual attitudes, and ATC communications. The objective is for non-instrument rated pilots to demonstrate their ability to be able to recover to VMC.

3-1253 RECOGNIZING AND AVOIDING FLAT-LIGHT, WHITEOUT, AND BROWNOUT CONDITIONS. After April 22, 2015, rotorcraft pilots are required by § 135.293(a)(9) to satisfactorily complete an oral or written test for procedures for aircraft handling in flat-light, whiteout, and brownout conditions, including methods for recognizing and avoiding those conditions. Inspectors should ensure this training and checking is incorporated in the operator's approved training program.

Table 3-68. Flight Training PIC/SIC Flight Training (All Training Categories)—Helicopter (under development)

FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
PREPARATION	Visual Inspection									
	Before-Taxi Procedures									
	Performance Limitations									
SURFACE OPERATION	Starting									
	Rotor Engagement									
	Rotor Engagement on Water SEA									
	Taxiing									
	Water Taxiing SEA									
	Lift-to-Hover IGE/OGE M									
	Hover Turns IGE/OGE									
	Sideward/Rearward Hovering									

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
	Slope Operations									
	Liftoff									
	Landing									
	Taxiing									
TAKEOFF	Normal M									
	Instrument									
	Obstacle Clearance									
	Running (High Altitude)									
	Category “A” M									
	Category “A” M With Powerplant Failure Before CDP									
	Category “A” M With Powerplant Failure After CDP CLIMB									
	Rejected Takeoff M									
CLIMB	Normal									
	Best Rate									
	Best Angle									
EN ROUTE	Medium-Banked Turns									
	Powerplant Shutdown and Restart									
	Low-Speed Characteristics									
	High-Speed Handling Characteristics									
	High-Speed Handling Characteristics									
DESCENT	Normal									
	Maximum Rate									
	Autorotative Glide									
APPROACHES	VFR Procedures M Normal									
	Obstacle Clearance									

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
	High Altitude									
	Elevated Landing Site									
	With Degraded Control Augmentation									
	Balked Landing M									
	Brownout/Whiteout/Flat Light Operations									
	IFR Precision Approaches M ILS/Normal									
	ILS/One Engine Inoperative									
	[ ] PAR/Normal									
	[ ] PAR/One Engine Inoperative #									
	IFR Nonprecision Approaches M NDB/Normal									
	VOR/Normal									
	[ ] LOC Backcourse Procedures									
	[ ] SDF/LDA Procedures									
	[ ] ASR Procedures									
	[ ] RNAV Procedures									
	[ ] LORAN C Procedures									
	[ ] Circling Approach M (FFS must be qualified for training/checking on the circling maneuver)									
	Missing Approaches M From Precision Approach									
	From Nonprecision Approach									
	NOTE: At least one MAP must be a complete approved procedure.									

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
	With Powerplant Failure									
LANDINGS	Normal									
	Normal to-the-water SEA									
	[ ] Category “A”									
	[ ] Category “A” With Powerplant Failure after LDP									
	Crosswind									
	From Precision Instrument Approach									
	From a Precision Approach With at Least 50 percent Power Deficiency									
	With Degraded Control Augmentation									
AFTER LANDING	Taxi									
	Parking #									
	Stopping the Rotors									
	Emergency Evacuation #									
UNPREPARED SITE OPERATIONS	Confined Areas									
	Pinnacles									
	Ridgelines									
	Water Sites SEA									
OTHER FLIGHT PROCEDURES DURING ANY AIRBORNE PHASE	Recovery from IIMC									
	Holding									
	Ice Accumulation on Airframe #									
	Air Hazard Avoidance #									
	Wind Shear/Microburst #									
SYSTEMS PROCEDURES TRAINING DURING ANY PHASE - Normal	Pneumatic/Pressurization									
	Air Conditioning									
	Fuel and Oil									
	Electric									

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
- Abnormal - Alternate	Hydraulic									
	Flight Controls									
	Anti-Icing and Deicing Systems									
	Autopilot									
	Flight Management Guidance Systems									
	Automatic or Other Approach and Landing Aids									
	Loss of Anti-Torque Effectiveness M									
	Airborne Weather Radar									
	Flight Instrument System Malfunction									
	Communications Equipment									
	Navigation Systems									
SYSTEMS PROCEDURES TRAINING DURING ANY AIRBORNE PHASE - Emergency	Aircraft Fires									
	Smoke Control									
	Powerplant Malfunctions									
	Electrical, Hydraulic, Pneumatic Systems									
	Flight Control Systems Malfunction									
	Landing Gear Malfunction									
	Anti-Torque Failure M									
	Settling-with-Power									
NIGHT VISION GOGGLE (NVG) ADDITIONAL CONSIDERATIONS	NVG Operational Checks									
	NVG Failure									
	Transitions: Aided/Unaided									
	Inadvertent IMC									
	Unusual Attitude Recovery									
	Ground Hazard Recognition									

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FLIGHT PHASE	TRAINING EVENT	LEVEL OF FLT TRNG DEVICE				LEVEL OF FULL FLT SIM				ACFT
		4	5	6	7	A	B	C	D	
	Brownout/Whiteout/Flat-Light Operations									
	External Light Techniques									
	Scanning Techniques									

RESERVED. Paragraphs 3-1254 through 3-1270.

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VOLUME 3 GENERAL TECHNICAL ADMINISTRATION

CHAPTER 24 EVALUATE 14 CFR PARTS 91 SUBPART K/121/135.411(A)(2) MAINTENANCE TRAINING PROGRAM RECORD

Section 1 Training Program Evaluation

3-1891 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.

A. Maintenance: 3633.

B. Avionics: 5633.

C. Air Transportation Oversight System (ATOS): ATOS Safety Attribute Inspection (SAI) or Element Performance Inspection (EPI) Data Collection Tool (DCT), as appropriate, for the Maintenance Training Program 4.2.1.

3-1892 OBJECTIVE. This section provides guidance for evaluating and accepting an operator/applicant's or fractional program manager's (hereafter referred to as the program manager) maintenance/inspection training program.

3-1893 GENERAL. Effective training is the basis for a successful maintenance/inspection program. Although many procedures for maintaining and inspecting aircraft may be similar, the equipment, procedures, and task documentation used may all be unique to the operator/program manager/applicant's specific programs.

A. Maintenance/Inspections. Title 14 of the Code of Federal Regulations (14 CFR) part 91 subpart K (part 91K) and part 135 may require, and parts 121 and 145 do require, that maintenance/inspections be performed in accordance with the operator/applicant's or program manager's manual.

B. Maintenance/Inspection Training Programs. Maintenance/inspection training programs are the most efficient manner to inform personnel of the requirements of the operator/applicant's or program manager's program.

3-1894 COORDINATION REQUIREMENTS AND SCHEDULING. Aviation safety inspectors (ASI) should encourage applicants to discuss pending maintenance/inspection training program development with the certification team before the program is submitted for final acceptance. It is especially important that programs be reviewed for conformity with appropriate regulatory requirements. This review can reduce the number of major changes an operator will have to make after a program has been printed and distributed.

3-1895 SCHEDULING MAINTENANCE TRAINING PROGRAMS. Delays in program acceptance result in delays in the certification process, or in the case of fractional ownership programs, delays in issuance of management specifications (MSpecs). To facilitate the evaluation of the training programs, the applicant should be encouraged to schedule a classroom training session in a timely manner.

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3-1896 CONTENT OF MAINTENANCE/INSPECTION TRAINING PROGRAMS. The program manager's Continuous Airworthiness Maintenance Program (CAMP) or operator/applicant's training program should include company indoctrination and technical training (formal and on-the-job training (OJT)). The program should contain a list of tasks to be taught and a method for recording the training. Completion of the training must be entered in the individual's training record.

A. Company Indoctrination. Each maintenance/inspection employee should receive instruction in the use of the operator/program manager/applicant's manuals, policies, procedures, and forms. The training program should contain a policy statement that emphasizes the importance of following the air carrier's documented maintenance procedures without deviation. Additionally, the program should include information pertaining to the air carrier's procedures for identifying errors or deficiencies in maintenance procedures and actions to be taken to ensure safe Federal Aviation Administration (FAA)-acceptable practices and Airworthy aircraft.

B. Maintenance/Inspection Technical Training.

1) Training may consist of a combination of formal (classroom) instruction and OJT. The operator/program manager/applicant may give training credit to individuals for experience gained while employed by other operators/program managers.

2) Procedures unique to the operator/program manager/applicant should be taught. Training records should indicate the amount of formal training, OJT, and experience each individual receives.

3) Technical training may be contracted to another operator or manufacturer, or in the case of a specialized process, to a person knowledgeable in that specialized process. The operator/program manager/applicant is responsible for the content and quality of such training.

4) The FAA does not establish a fixed amount of time for indoctrination or technical training courses, but the courses should use a minimum time proportional to the operator/program manager/applicant's complexity.

C. Responsibilities for Persons Other than an Operator/Program Manager's Employees. Part 121 requires each certificate holder to be primarily responsible for having a training program and to ensure that the training received throughout the operator's system is of equal quality and effectiveness. This covers all personnel, such as the certificate holder's employees and contract personnel for emergency maintenance and servicing.

1) Part 91, § 91.1433; part 121, § 121.375; and part 135, § 135.433 are similar in that each certificate holder or person who performs maintenance shall have a training program. The training program ensures that each person, including inspection personnel, is fully informed about procedures, techniques, new equipment in use and is competent to perform the applicable duties.

2) Sections 91.1429(a), 121.371(a), and 135.429(a) are similar in that no person may use any person to perform required inspections unless the person performing the inspections is appropriately certificated, properly trained, qualified, and authorized to do so.

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NOTE: Title 14 CFR part 1 defines a "person" as an individual, firm, partnership, corporation, company, association, joint-stock association, or governmental unit.

D. Category (CAT) II/III Maintenance Personnel Training. Each applicant for CAT II/III must establish an initial and recurrent training program. This program must be acceptable to the Administrator and cover all personnel performing quality control inspection and maintenance work on CAT II/III airborne systems and equipment. Training records for such personnel are to be kept current and made available to the FAA for inspection.

E. Recurrent Training. The operator/program manager/applicant's training program should ensure that deficiencies discovered through continuous analysis and surveillance are corrected during recurrent training. Fractional ownership program manager's personnel who are responsible for maintenance are required to receive annual training. Additionally, recurrent training should include at least the following:

- Review, reinforcement, and upgrade of all training given in both indoctrination and technical subjects,
- Input from maintenance bulletins and/or maintenance newsletters, and
- Tasks, such as run-up/taxi, Required Inspection Items (RII), and nondestructive inspection (NDI).

F. Training Records. Training records must be retained by the operator/program manager/applicant to document that personnel are adequately trained. Training records should be maintained at a central location, but may be maintained at other locations provided these locations are listed in the operator/program manager/applicant's manual. The format for recordkeeping may be electronic, or any other media acceptable to the Administrator.

G. Special Emphasis Training. Special maintenance/inspection training programs are required when new or different types of aircraft and/or equipment are introduced.

H. Fractional Ownership Training Requirements. Fractional ownership programs require aircraft-specific technical training for those persons who are responsible for maintenance. This training is intended for persons within the fractional ownership program who oversee and/or schedule maintenance and inspections and are responsible for creating or amending the manager's inspection or maintenance program(s). The training, which is required both initially and annually (recurrent), ensures that those personnel are technically knowledgeable of the aircraft. This specific training requirement does not extend to the persons performing the maintenance. However, all maintenance personnel must still meet the requirements of the applicable regulations, such as 14 CFR parts 43, 65, and 145.

I. Fractional Ownership CAMP. Program managers who maintain their aircraft in accordance with a CAMP have additional training requirements. Section 91.1433 requires that the program manager, or person performing maintenance for the program manager, has a training program. This program must ensure that each person, including inspection personnel, who determines the adequacy of work performed is fully informed about the procedures, techniques, and new equipment in use and is competent to perform the work. Section 91.1429 also requires

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any person who performs required inspections to be properly trained. This is in addition to his or her certification, authorization, and qualification requirements.

3-1897 ACCEPTING THE MAINTENANCE/INSPECTION TRAINING PROGRAM. The task of acceptance differs from approval in that no specific procedure or vehicle is used to accept a training program. See Volume 3, Chapter 32, Section 6, Evaluating, Accepting or Approving Maintenance-Related Manuals, Procedures, and Checklists for comprehensive information on the acceptance process.

3-1898 COORDINATION REQUIREMENTS. This task requires coordination with maintenance, avionics, and regional specialists.

3-1899 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Title 49 of the United States Code (49 U.S.C.) § 44705.
- Title 14 CFR parts 65, 91K, 121, 135, and 145.
- Title 49 of the Code of Federal Regulations (49 CFR) part 173.
- ATOS Element: Maintenance Training Program 4.2.1.

B. Forms. None.

C. Job Aids. Job Task Analysis (JTA): 3.3.20.

3-1900 PROCEDURES.

A. Review Operator/Program Manager File.

B. Review Schedule of Events (SOE). If this task is performed as part of an original certification or issuance of MSpecs, review the SOE to ensure that this task can be accomplished in accordance with the schedule.

C. Review Maintenance/RII Training Programs. The program should include the following elements in both the maintenance training program and the RII training program.

1) The name of the person responsible for the overall administration of the maintenance/RII training program.

2) The name(s) of the person(s) responsible for other processes within the maintenance/RII training program (e.g., recordkeeping, revisions to training programs, and security of the program).

3) Designated maintenance/RII training instructors.

4) A description of how instructors are determined to be qualified.

5) Procedures used to authorize instructors.

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6) A file on the instructors consisting of qualifications, authorizations, and other documents pertaining to instructor assignments.

7) A list describing what type of training is required for new employees or RII candidates (indoctrination, OJT, etc.).

8) Procedures for evaluating, crediting, and documenting a new employee's previous training.

9) Procedures for determining what additional training is required for a new employee.

10) A schedule for recurrent training, a description of recurrent training, and procedures for determining requirements for other training.

11) Recordkeeping procedures, including records of the following:

- Training dates,
- Who performed the training (instructor should indicate by signing),
- The number of hours of training performed, and
- The content of the training performed.

12) Criteria for determining the quality of the training program (training standards).

13) Evaluation of the need to revise training programs.

14) A training syllabus that describes the following:

- Content of each training course,
- Format of training (classroom, OJT),
- Duration of training courses,
- Standards for grading students, and
- Training aids.

15) Criteria to determine acceptability of contract training, to include:

- Qualifications of instructors,
- Criteria to establish appropriateness of reference material being taught,
- Reporting procedures to inform the operator/program manager of student progress,
- Criteria to determine adequacy of facilities, and
- Criteria to evaluate contractor's training syllabus.

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D. Review RII Training. The operator/program manager/applicant must provide RII original and recurrent training, including:

1) A statement that RII students are appropriately certificated, qualified, trained, authorized, and current as airframe and/or powerplant mechanics or appropriately certificated repairmen.

NOTE: Part 91K does not allow repairmen to be used for RII purposes.

2) A method for notifying the RII candidate of the successful completion of the course.

3) A method for receiving confirmation by the candidate of acceptance of RII authorizations and responsibilities.

E. Observe Operator/Program Manager/Applicant Performing Training. This observation is performed regardless of whether the operator/program manager performs the training or contracts with another company.

1) Ensure that facilities are adequate, including classrooms, training aids, and reference materials.

2) Evaluate the instructor's presentation and knowledge.

3) Ensure that course content and instruction is in accordance with the training syllabus.

4) Ensure that training recordkeeping is performed in accordance with the maintenance/RII inspection program.

F. Analyze Findings. Evaluate all deficiencies to determine what changes will be required.

G. Debrief the Operator/Program Manager/Applicant.

1) If deficiencies are discovered during the interview, return the program to the operator/program manager/applicant with a letter describing the problem areas. If the review is being performed as part of a certification, inform the operator/program manager/applicant that the issue of the certificate will be withheld until deficiencies are corrected.

2) Schedule a meeting with the operator/program manager/applicant to discuss the problem areas if it may be helpful in resolving deficiencies. Discuss how to resolve deficiencies.

3-1901 TASK OUTCOMES.

A. Complete the PTRS Record.

B. ATOS. Complete ATOS SAI or EPI DCT, as appropriate for the Maintenance Training Program 4.2.1.

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C. Complete the Task. Successful completion of this task will result in the following:

1) A letter to the operator/program manager/applicant indicating acceptance of the program.

2) The original accepted program sent to the operator/program manager/applicant along with instructions to provide a copy of the program to the certificate-holding district office (CHDO).

3) ATOS successful completion of this task will result in the acceptance of the Maintenance Training Program or revision and/or a determination that the training is being performed properly and is producing the desired results.

D. Document the Task. File all supporting paperwork in the operator/program manager/applicant's file.

3-1902 FUTURE ACTIVITIES. Normal surveillance.

RESERVED. N/A.

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VOLUME 3 GENERAL TECHNICAL ADMINISTRATION

CHAPTER 24 EVALUATE 14 CFR PARTS 91 SUBPART K/121/135.411(A)(2) MAINTENANCE TRAINING PROGRAM RECORD

Section 2 Evaluate and Accept a Maintenance Human Factors Training Program

3-1903 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.

A. Maintenance: 4306, 4307, 4372, 4373.

B. Avionics: 6306, 6307, 6372, 6373.

3-1904 OBJECTIVE. This section provides guidance for the evaluation, acceptance, and, in certain scenarios, approval of human factors training programs. Inspectors may also use this guidance for acceptance of human factors training programs for both the Aviation Maintenance Technician (AMT) awards and Inspection Authorization (IA) renewals.

3-1905 GENERAL.

A. Effective Training. Effective training is the basis for a successful maintenance and inspection program. Although many procedures for maintaining and inspecting aircraft may be similar, the equipment, procedures, and task documentation vary widely depending on the operator/applicant's specific program. Human factors training plays an essential part in identifying those areas and is the most efficient manner of educating maintenance technicians and others of the importance of good human factors principles, practices, and techniques.

B. Human Training Programs. Numerous airlines, repair stations, and training organizations now provide human factors training and desire Federal Aviation Administration (FAA) recognition of their training programs. This document will provide guidance in accepting or approving these vital human factors training programs.

C. AMT Awards Program. In October 1991, the Aircraft Maintenance Division (AFS-300) determined a need for an incentive program to encourage training recognition for AMT employees and employers. Human factors training is now an acceptable portion of the training for the AMT Awards Program.

3-1906 DISCUSSION.

A. Human Factors Issues. Human factors issues contribute to approximately 80 percent of all aviation accidents and incidents. Factors that influence the human must be recognized, identified, and communicated. Maintenance procedures and controls can then be used to reduce or prevent outside influences that cause performance mistakes. Research and experience have shown that human factors training can address many of the issues that contribute to these maintenance events. Attention to maintenance human factors can raise efficiency, effectiveness, and safety in aviation environments. This translates to better expense control and long-term safety benefits.

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B. Maintenance Human Factors Training. Maintenance human factors training is part of a total system in managing human error. It is an essential part of a system aimed at individuals engaged in hands-on maintenance, and those who supervise and plan maintenance activity. Human factors training should cover basic safety principles and practices integrated within a maintenance organization's program.

C. Objective. The objective of human factors training is to provide principles and techniques that will help operators do a better job by:

- Improving safety;
- Decreasing organizational exposure to risk;
- Reducing and capturing errors; and
- Encouraging employees to report safety issues and concerns without fear of retribution.

NOTE: These objectives contribute to the FAA's safety goal of achieving the lowest possible accident rate and continuously improving safety.

D. Designing Human Factors Training. Designing human factors training for specific organizations is often most effective considering such factors as:

- Characteristics of the people in the work force;
- Physical and social conditions of the work environment;
- Type of work being performed, like heavy maintenance, light maintenance, aircraft line maintenance, and aircraft size and type; and
- Resources necessary to complete the work safely and efficiently.

E. Initial/General Human Factors Training. For initial or general human factors training, it may not be necessary for an operator to conduct an extensive job and task analysis, but to merely understand the most important safety concerns within its organization. There are many fundamental principles of human factors that apply to all maintenance work.

F. Proposed Training Plans. The aviation safety inspector (ASI) should review proposed human factors training to ensure its focus on "real-world" human factors challenges faced in aviation maintenance or related work. Proposed training plans that lack sound fundamentals or examples of real world aviation maintenance challenges are likely not as acceptable or desirable for aviation maintenance human factors training.

G. Design of Human Factors Training. The design and delivery of repeated, recurrent, or continued human factors training within a specific organization should have as its basis company-specific examples derived from its event investigation system data. AMTs learn best from specific examples within their own organization.

H. Commercial Multimedia Human Factors Training Products. A number of commercial multimedia human factors training products should receive consideration for an accepted or approved training program. However, these products are best when discussion led by

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a credible human factors instructor supplements them. The ASI must review all media and movies that the application package includes to ensure suitability for all types of audiences.

I. Aviation Maintenance/Human Factors Discipline. The instructor should have capabilities and experience related to aviation maintenance and/or the human factors discipline that a reasonable person would accept as credible. The instructor should have effective communication skills and the ability to convey credibility to the majority of the students or course participants. An acceptable course leader's most highly preferred attribute is experience in aviation maintenance.

3-1907 CONSIDERATIONS FOR ACCEPTABLE CONTENT.

A. Acceptable Topics. An unlimited number of human performance topics are acceptable for all types of human factors training. Approval of content should be at the discretion of the FAA ASI and may require additional discussion or correspondence with the applicant. The ASI should consider the size of an organization and the work it performs when reviewing an organization's human factors training program.

B. Key Topics in a Good Human Factors Training Program. The FAA's maintenance human factors experts along with other regulatory agencies, including the European Aviation Safety Agency (EASA) and Transport Canada (TC), have identified the following key topics that a good human factors training program is likely to include:

1) A general introduction to human factors.

2) Safety culture/organizational factors.

3) Human error—error principles, event investigation, and case studies.

4) Human performance and limitations.

5) Environments, both physical and social.

6) Organizational procedures, information, tools, and proper task documentation and sign-off practices.

7) Planning of tasks, equipment, and spares.

8) Communication and the lack thereof.

9) Teamwork and leadership.

10) Professionalism and integrity.

11) Shift and task turnover.

12) Undocumented maintenance.

13) Complacency.

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14) Lack of knowledge.

15) Distraction.

16) Lack of resources.

17) Pressures.

18) Lack of assertiveness.

19) Norms.

20) Stress.

21) Lack of awareness.

22) Fatigue management/fitness for duty.

23) Procedural noncompliance.

C. Supportive Content. The ASI should still consider content not included in subparagraph 3-1907B if it directly relates to a case study or other scenarios that support human factors initiatives.

3-1908 HOURS OF HUMAN FACTORS TRAINING CREDIT. A formal block of human factors training lasting at least 50 minutes constitutes 1 hour of training. For the AMT awards program, refer to the current edition of Advisory Circular (AC) 65-25, William (Bill) O'Brien Aviation Maintenance Technician Awards Program, for details on acceptable hours of human factors training credit. The FAA will also accept up to 6 hours of human factors training towards IA renewal.

3-1909 APPLICATION PROCESS.

A. Course Review. For review of a human factors training program, an applicant should contact the FAA office in person, make arrangements to have a meeting, or submit a letter of request for course review to the local FAA office. The applicant must provide all material used for the training to the FAA to ensure proper course review.

B. Non-U.S. Organizations' Courses. Non-U.S. organizations also provide training in areas required by their aviation authority that may crossover to required training such as human factors. These courses may receive acceptance or approval using this guidance, but exercise caution during the review process to ensure they do not embed foreign aviation authority regulations which could confuse technicians on FAA regulatory and nonregulatory requirements. The foreign applicant should contact its closest regional FAA office for further assistance.

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C. Determining Delivery Options for Unconventional Training. Applicants using any unconventional or non-traditional means of providing human factors training (such as computer-based instruction (CBI), satellite-delivered media, Internet, etc.) or nonconventional training will submit it to AFS-300 for review to determine a suitable means of delivery.

3-1910 RECONSIDERATIONS.

A. Notification of Unacceptability. If the FAA determines that a course is unacceptable, it will notify the training provider in writing and explain why. We highly recommend that the training provider work closely with the FAA office to understand why the training program was unsatisfactory and to remedy the training deficiencies as soon as possible.

B. Reconsideration Request. If the training provider does not agree with the reviewing office regarding the nonacceptance, the training provider may request reconsideration of the decision by writing to: FAA Headquarters, Aircraft Maintenance Division, AFS-300, 800 Independence Ave. SW, Washington, DC 20591.

C. Final Decision. AFS-300 will make the final decision on the request for reconsideration. AFS-300 will directly forward the decision to the training provider with a copy to the associated FAA office. The AFS-300 decision may affirm, modify, or reverse the initial decision.

3-1911 RELATED REGULATORY AND CONTENT GUIDANCE. For more information, consult the following documents (current editions):

A. Title 14 of the Code of Federal Regulations (14 CFR) Part 1. Definitions and Abbreviations.

B. Title 14 CFR Part 43. Maintenance, Preventive Maintenance, Rebuilding, and Alteration.

C. AC 120-16. AC 120-16, Air Carrier Maintenance Programs, which describes air carrier aircraft maintenance programs. It explains the background as well as the FAA's regulatory requirements for these programs.

D. AC 120-66. AC 120-66, Aviation Safety Action Program (ASAP), which provides information encouraging air carrier and repair station employees to voluntarily report critical safety information.

E. AC 120-72. AC 120-72, Maintenance Resource Management Training, which presents guidelines for developing, implementing, reinforcing, and assessing maintenance resource management training programs for improving communication, effectiveness, and safety in maintenance operations. This AC also provides a training template.

F. AC 120-78. AC 120-78, Acceptance and Use of Electronic Signatures, Electronic Recordkeeping Systems, and Electronic Manuals, which provides information on electronic recordkeeping.

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G. AC 120-79. AC 120-79, Developing and Implementing an Air Carrier Continuing Analysis and Surveillance System, which provides information on how to implement a Continuing Analysis and Surveillance System (CASS), which 14 CFR part 121 requires for air carriers.

H. AC 120-92. AC 120-92, Safety Management Systems for Aviation Service Providers, which provides information on how to develop a Safety Management System (SMS).

I. FAA Order 8900.1. Volume 3, Chapter 24, Section 1, Training Program Evaluation, provides guidance for evaluating and accepting an operator/applicant's maintenance/inspection training program.

J. FAA Operator's Manual for Human Factors in Aviation Maintenance. The FAA Operator's Manual for Human Factors in Aviation Maintenance, which provides information on how to implement a human factors program in maintenance. The manual is available at http://www.faa.gov/about/initiatives/maintenance_hf/library/documents/media/human_factors_maintenance/hf_ops_manual_2014.pdf.

K. Air Transport Association of America (ATA) Specification 104. ATA Specification 104, Guidelines for Aircraft Maintenance Training, provides guidance on training development, including task analysis and industry-defined training levels. This document is available at https://publications.airlines.org/CommerceProductDetail.aspx?Product=11.

L. Further Information. You can obtain further information regarding the 12 common causes of maintenance human factor errors (included in paragraph 3-1907) from the TC link below: http://www.tc.gc.ca/eng/civilaviation/standards/systemsafety-posters-menu-723.htm. Additionally, many aviation training and consulting organizations provide excellent information regarding the "dirty dozen," which you can easily reference using the Web.

3-1912 PREREQUISITES AND COORDINATION REQUIREMENTS.

A. Prerequisites. Knowledge of the regulatory requirements of 14 CFR parts 43 and 65.

B. Coordination. This task may require coordination with other Flight Standards District Offices (FSDO), certificate management offices (CMO), and International Field Offices (IFO).

3-1913 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- AC 65-25, William (Bill) O'Brien Aviation Maintenance Technician Awards Program.
- AC 120-72, Maintenance Resource Management Training.
- FAA's Operators Manual for Human Factors in Aviation Maintenance.
- Volume 3, Chapter 24, Section 1, Training Program Evaluation.
- Volume 5, Chapter 5, Section 7, Evaluate Part 65 Inspection Authorization.

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B. Forms:

- FAA Form 8310-5, Inspection Authorization.
- FAA Form 8610-1, Mechanic's Application for Inspection Authorization.
- Aviation Maintenance Technician Awards Certificates.
- Aviation Maintenance Technician Awards Brochure.

C. Job Aids. None.

3-1914 PROCEDURES.

A. Ensure Applicant Meets Eligibility Requirements.

B. Evaluate Training Program Content.

1) The procedures for obtaining the training program approval normally begin with a meeting between the training provider's key personnel and the principal inspector (PI) or responsible ASI to discuss the scope of the training, the timing of the program document submittal, and other issues. This meeting will be an opportunity for the training provider to ask questions about the FAA process. Although highly recommended, this is not a required meeting.

2) The training provider may submit its training program contents as electronic media if it ensures the reviewing FAA office is able to look at and store the submitted material in the media the training provider selects. A transmittal document must accompany material submitted electronically. These transmittal documents may be in the form of an email, fax, or letter and may include the use of electronic signatures. The training provider's accountable manager or someone acting on the manager's behalf should sign the submittal. If a program is too large to send electronically, it will be the responsibility of the training provider to make alternate arrangements to deliver the program to the FAA office for review.

3) The reviewing FAA office may use the criteria and standards described in AC 120-72 and the items listed in paragraph 3-1907 to review the content of the initial training program. Not every item listed in the guidance needs to appear in the training, but the reviewing office should use the list to suggest items that better meet the needs of the maintenance organization.

4) The FAA will review the proposed training program or revision and either approve it or prepare an explanation of why the program or revision is not acceptable as submitted. The reviewing office will send a letter or electronic transmittal of its approval or nonacceptance to the individual who signed the submittal for the training.

5) If the FAA does not accept a submittal, the training provider should propose revisions that address the FAA's concerns. When the training provider has adequately addressed all the concerns expressed in the FAA nonacceptance, the FAA will accept and/or approve the program.

6) The training provider or input from the PI or responsible ASI can initiate a change to the accepted or approved training program. The training provider should provide any revision

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to the program document to the inspector for further acceptance or approval. The training program may change to accommodate modifications to the training provider's work, and/or its customers, and in response to the ongoing assessment processes of the customer and of the FAA. Correction of typographical errors and changes to phone numbers are examples of changes not requiring FAA acceptance or approval. However, the training provider should send a corrected copy to the FAA.

7) The instructor should have capabilities and experience related to aviation maintenance and/or the human factors discipline that a reasonable person would accept as credible. The instructor should have effective communication skills and the ability to convey credibility to the majority of the students or course participants. Experience in aviation maintenance is an acceptable course leader's most highly preferred attribute.

8) The FAA does not determine instructor qualifications. However, if the FAA—through its surveillance process—finds that the qualifications or skills of an instructor are deficient, the training provider must correct any deficiency associated with that instructor and with its instructor selection.

9) The training program should have a process measurement element that verifies the effectiveness of the training. This provides a continuous improvement characteristic to the training program. Therefore, one of the key areas the FAA will monitor is the feedback process that takes evaluation results and adjusts training needs. The FAA might also independently assess training to evaluate the effectiveness, particularly where safety risk is relatively high.

10) If the program or program revision submittal is in an electronic format, the FAA inspector will indicate acceptance, approval, or nonacceptance with an email message or letter. If the FAA denies the submittal, the email message or letter will include an explanation of the denial.

11) The training provider should initiate its revision process as follows. The training provider or operator informs the FAA that it is planning to submit a training program for approval by way of an initial meeting in person, or a letter of request sent to its local FAA office.

12) The FAA may initiate the training program acceptance or nonacceptance process as follows. When review of the training program or revision has shown compliance with the form and manner prescribed in this chapter, the FAA issues a letter of acceptance.
See Figure 3-217, Example Letter of Acceptance, Figure 3-218, Example Letter of Acceptance (AMT Awards Program), and Figure 3-219, Example Letter of Nonacceptance.

13) When rejecting review for approval of the training program or revision, issue a letter of nonacceptance, with an explanation of discrepancies; you may use the letter of acceptance format.

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Figure 3-217. Example Letter of Acceptance

XYZ Training
Accountable Manager
123 Anywhere Blvd
Somewhere, PA 13579

Dear Mr. Trainer,

The FAA is pleased to notify you we have reviewed and accepted the XYZ human factors training course for the purpose you submitted with the revision date of [XX/XX/XX].

As a training provider of an FAA-accepted course you must:

- Keep the course material current and complete according to the original submission.
- Facilitate it in the intended manner and length.
- Allow Flight Standards to monitor sessions presented under this letter of acceptance. In addition, provide all training materials the attendees would receive, upon the request of the FAA individual monitoring the training.
- Upon completion of training, provide the attendees with a certificate verifying their completion of the FAA-accepted training, and the total length of time for the course.
- Maintain a list of attendees or training records to document that personnel have received adequate training in human factors, to be available to any FAA office upon request.

You may revise the course at any time using one of the following two methods:

1. Change: These are minor updates, alterations, and deletions that constitute minimal course revisions to the original material. The training provider does not have to notify the FAA of these types of changes.

2. Revisions: These are major rewrites to the original course material submitted for acceptance. Revisions may include changing course subjects, subtracting or adding course material not found in the original course. The training provider must submit the revision to this office for review and acceptance at least 30 days prior to facilitating the revised course. After reviewing and accepting the modifications, the FAA will issue a new letter of acceptance in accordance with the current edition of AC 65-25.

Again, congratulations and thank you for your interest in maintenance human factors, and your commitment to maintenance training, and aviation safety. Should you have any further questions, contact this office at [(XXX) XXX-XXXX].

Sincerely,

John J. Inspector
Aviation Safety Inspector
800 Independence Ave. SW
Washington, DC 20591

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Figure 3-218. Example Letter of Acceptance (AMT Awards Program)

ABC Training
Accountable Manager
456 Anywhere Blvd
Anywhere, PA 24680

Dear Mr. Trainer,

The FAA is pleased to notify you we have reviewed and accepted the ABC human factors training course for the purpose you submitted. As of this date, the training course provided with the revision date of [XX/XX/XX] meets the requirements specified in the current edition of AC 65-25 and is granted [X] hours of credit towards the AMT Awards Program.

As a training provider of an FAA-accepted course you must:

- Keep the course material current and complete according to the original submission.
- Facilitate it in the intended manner and length.
- Allow Flight Standards to monitor sessions presented under this letter of acceptance. In addition, provide all training materials the attendees would receive, upon the request of the FAA individual monitoring the training.
- Upon completion of training, provide the attendees with a certificate verifying their completion of the FAA-accepted training, and the total length of time for the course.
- Maintain a list of attendees or training records to document that personnel have received adequate training in human factors, to be available to any FAA office upon request.

Please advise those individuals successfully completing this training that the FAA will accept the total hours of your training program towards the AMT Awards Program. Simply have them provide a copy of their training certificate to their local FAA office when applying for the AMT award.

You may revise the course at any time using one of the following two methods:

1. Change: These are minor updates, alterations, and deletions that constitute minimal course revisions to the original material. The training provider does not have to notify the FAA of these types of changes.

2. Revisions: These are major rewrites to the original course material submitted for acceptance. Revisions may include changing course subjects, subtracting or adding course material not found in the original course. The training provider must submit the revision to this office for review and acceptance at least 30 days prior to facilitating the revised course. After reviewing and accepting the modifications, the FAA will issue a new letter of acceptance in accordance with the current edition of AC 65-25.

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Again, congratulations and thank you for your interest in maintenance human factors, and your commitment to maintenance training and aviation safety. Should you have any further questions, contact this office at [(XXX) XXX-XXXX].

Sincerely,

John J. Inspector
Aviation Safety Inspector
800 Independence Ave. SW
Washington, DC 20591

Figure 3-219. Example Letter of Nonacceptance

XYZ Training
Accountable Manager
123 Anywhere Blvd
Somewhere, PA 13579

Dear Mr. Trainer,

This letter is in response to your request for acceptance of Revision 2 to XYZ training program/revision, dated [XX/XX/XX]. We have rejected your request for approval of revision 2 for the following reason(s). Revision 2 deletes training previously given on communications and fatigue and does not provide any additional type of identifiable instruction to your mechanics, repairmen, or technicians.

Presently, no other course of training for XYZ training contains adequate information on these important human factors issues. For further information, you may contact this office at [(XXX) XXX-XXXX].

Sincerely,

John J. Inspector
Aviation Safety Inspector
800 Independence Ave. SW
Washington, DC 20591

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3-1915 TASK OUTCOMES.

A. Complete the PTRS Record.

B. Air Transportation Oversight System (ATOS) Action. Airworthiness PIs will ensure that their air carrier's Director of Safety (DOS) is aware of this change.

1) PIs will assess the air carrier's response to the recommendation. An air carrier's failure to implement these recommendations into its existing program could result in an increase in risk in several areas.

2) PIs will determine if additional surveillance or further air carrier action is necessary to address the potential increased risk. Possible additional actions may include retargeting the Comprehensive Assessment Plan (CAP) to include accomplishing appropriate design assessments or performance assessments, convening a System Analysis Team (SAT), or reevaluating air carrier approvals or programs.

C. ATOS Reporting. PIs will make an ATOS entry using the Other Observation Dynamic Observation Report (DOR) function to record the actions directed by this change. PIs will access the Create DOR option on their ATOS Homepage, select the Other Observation tab, and:

1) Select System: 4.0 Personnel Training and Qualifications.

2) Select Sub-system: 4.2 Training Programs.

3) Select the appropriate air carrier from the drop-down menu.

4) Select the appropriate PTRS Activity Number from the drop-down menu.

5) Enter the activity's start and completion date.

6) Enter the location of the activity's performance.

7) Enter "8900MHF" in the Local/Regional/National Use field.

8) Use the Comments field to record any comments reflecting interaction with the air carrier and the air carrier's response to the recommendation.

9) Input any actions taken in the Reporting Inspector Action Taken field.

10) Select the Save button after making all entries.

3-1916 FUTURE ACTIVITIES. Routine surveillance.

RESERVED. Paragraphs 3-1917 through 3-1920.

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VOLUME 3 GENERAL TECHNICAL ADMINISTRATION

CHAPTER 35 PROCESS PART 121 AND 135 OPERATOR'S AIRCRAFT/ENGINE UTILIZATION REPORT

Section 1 Reserved

RESERVED. Paragraphs 3-3656 through 3-3680.

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VOLUME 3 GENERAL TECHNICAL ADMINISTRATION

CHAPTER 36 REVIEW 14 CFR PART 121/135.411(A)(2) ENGINEERING CHANGE AUTHORIZATION

Section 1 Evaluating an Engineering Change Authorization/Order

3-3681 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.

A. Maintenance: 3346.

B. Avionics: 5346.

3-3682 OBJECTIVE. This chapter provides guidance for evaluating an Engineering Change Authorization/Order (EA/EO).

3-3683 GENERAL.

A. EA/EO Provided Formats for Air Carriers. An EA/EO provides an air carrier with a format for:

1) Documenting major repairs and alterations to equipment the operator uses;

2) Recording Federal Aviation Administration (FAA)-approved data and procedures for accomplishing alterations and repairs to aircraft, propellers, powerplants, accessories, and components. If no previously approved data exists, the operator must obtain approval through an FAA engineering office, a Designated Engineering Representative (DER), or "FAA field approval;" and

3) Developing procedures and data used to comply with and provide verification of Airworthiness Directives (AD).

B. Evaluating an EA/EO. In evaluating an EA/EO, an inspector must approach this task in the same manner as reviewing/approving a major repair or alteration. This is done by using the procedures contained in Volume 4, Chapter 9, Section 1, Perform Field Approval of Major Repairs and Major Alterations.

NOTE: If an inspector is not completely familiar with equipment involved in the EA/EO, FAA Engineering should be contacted for assistance prior to issuing a field approval.

C. Reviewing an EA/EO. In reviewing an EA/EO, the inspector should be aware that the EA/EO serves not only as a maintenance record but also as a planning document for the operator. The EA/EO will normally contain material and personnel requirements, diagrams (blueprints, schematics, etc.), detailed procedures, and signoffs. The inspector should ensure that all data is correct, complete, and does not conflict with existing EA/EO or maintenance procedures.

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D. EA/EO Provisions for New/Modified Equipment. If the EA/EO concerns new or modified equipment, maintenance procedures may have to be revised or developed. Coordination with the principal operations inspector (POI) may be required to ensure that the operations manual and/or Approved Flight Manual (AFM) contain the revised or new procedures.

3-3684 PREREQUISITES AND COORDINATION REQUIREMENTS.

A. Prerequisites.

- Knowledge of the equipment involved in the EA/EO.
- For EA/EO requiring field approvals for major alterations, the inspector must be authorized by the regional Flight Standards division (RFSD) or Branch to grant field approvals.

B. Coordination. This task requires coordination between the principal avionics inspector (PAI), principal maintenance inspector (PMI), POI, FAA Engineering, Regional Office (RO), the manufacturer, and the operator.

3-3685 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- FAA-approved data (Maintenance/manufacturer's manuals, Supplemental Type Certificates (STC), AD, etc.).
- Title 14 of the Code of Federal Regulations (14 CFR) part 43.
- Order 8900.1, Volume 4, Chapter 9, Selected Field Approvals.

B. Forms. None.

C. Job Aids. None.

3-3686 PROCEDURES.

A. Review the Operator's Submitted EA/EO. Ensure the following:

1) Operator's classification (minor/major) is correct.

2) If classified as major, that data has previous FAA approval (if not, see Volume 4, Chapter 9, Selected Field Approvals).

3) Diagrams and procedures are clear, precise, and complete.

4) Proper materials are listed and employed.

5) Individual maintenance and inspection task signoffs are provided for and are adequate to ensure EA/EO compliance.

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6) The EA/EO does not affect existing systems and/or procedures.

7) Maintenance/operating manuals and procedures are revised to include new or revised procedures that may be required as a result of the EA/EO.

B. Analyze Findings. If discrepancies are noted, contact the operator and request corrective action.

3-3687 TASK OUTCOMES.

A. Complete the PTRS Record.

B. Complete the Task. Successful completion of this task will result in the following:

1) For a minor EA/EO, discard the office copy of the EA/EO.

2) For a major EA/EO with previously approved or field approved data, file the EA/EO in the certificate-holding district office's (CHDO) operator file.

3) For a major EA/EO without previously approved data, accomplish one of the following:

a) Field approve the EA/EO.

NOTE: Inspectors are not required to give a field approval. This is done at the inspector's discretion. Knowledge of the equipment involved should be taken into consideration.

b) Send the EA/EO to FAA Engineering for further evaluation and/or approval.

c) Return the EA/EO to the operator to obtain the necessary approvals through DERs, etc.

d) When data is approved (e.g., field or engineering), inform the operator of the findings and return the signed original to the operator.

C. Document the Task. File all supporting paperwork in the operator's office file.

3-3688 FUTURE ACTIVITIES. Normal surveillance.

RESERVED. Paragraphs 3-3689 through 3-3705.

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VOLUME 3 GENERAL TECHNICAL ADMINISTRATION

CHAPTER 44 ASSESS CONTINUING ANALYSIS AND SURVEILLANCE SYSTEM FOR PARTS 121 AND 135

Section 1 Evaluating an Air Carrier's CASS

3-3891 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) AND AIR TRANSPORTATION OVERSIGHT SYSTEM (ATOS) ACTIVITIES.

A. Maintenance:

- New: 3333.
- Revision: 3334.
- Surveillance: 3635.

B. Avionics:

- New: 5333.
- Revision: 5334.
- Surveillance: 5635.

C. ATOS. ATOS Safety Attribute Inspection (SAI) or Element Performance Inspection (EPI) Data Collection Tool (DCT), as appropriate, for the Continuing Analysis and Surveillance System (CASS) Element 1.3.11.

3-3892 OBJECTIVE. This section provides guidance and information on the design, implementation, functions, and other considerations of an air carrier's CASS.

3-3893 GENERAL.

A. Regulatory Requirements. Title 14 of the Code of Federal Regulations (14 CFR) part 121, § 121.373 and part 135, § 135.431 require an air carrier operating under part 121 or 135 to establish and maintain a CASS. These sections also allow the Federal Aviation Administration (FAA) to require revisions to an operator's maintenance program based on deficiencies or irregularities revealed by the CASS.

B. Background.

1) The FAA implemented the regulatory requirement for a CASS in 1964 in response to safety concerns and discoveries of systemic weaknesses in the maintenance programs of some air carriers. We identified these concerns during accident investigations and FAA surveillance activities accomplished during the 1950s. The FAA introduced the CASS as an element of a Continuous Airworthiness Program in a 1964 rulemaking that contained other elements such as a manual, an adequate maintenance organization, a maintenance recordkeeping system, Required Inspection Items (RII), and more.

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2) There is a requirement for a CASS for air carriers operating under part 121 and § 135.411(a)(2) applicability. CASS utilizes a systems-based approach, which permits an air carrier to identify and understand maintenance program deficiencies well enough to develop and implement permanent solutions for those discrepancies. CASS is a keystone of an air carrier's ability to produce Airworthy aircraft on a consistent basis.

C. Definitions.

1) Audit. Scheduled or unscheduled formal reviews and verifications to evaluate compliance with policy, standards, and/or contractual requirements.

2) Authority. The power to design or change fundamental policy or procedures without having to seek a higher level management approval. Authority is a permission; it is a right coupled with an autonomous power to accomplish certain acts or order others to act. Often, one person grants another authority to act as an employer to an employee, a corporation to its officers, or as a governmental empowerment to perform certain functions.

3) Carried Out by the Certificate Holder or Other Person. The certificate holder must maintain operational control over maintenance that any person performs on its aircraft. Operational control includes independently determining the scope and type of maintenance that may be required, when to accomplish that maintenance, and if the maintenance was done in accordance with its manual and program, regardless of who accomplished the maintenance.

4) CASS. The elements of the system are always working. For example, continuing surveillance means someone is always looking and collecting information. Continuing analysis means that someone is always analyzing the information that is always being collected.

5) Corrective Action. An action designed to eliminate or mitigate a deficiency that has been identified within the air carrier's maintenance program.

6) Deficiency. A condition which is insufficient or incomplete or where something required is lacking. In a CASS, it is something that is missing from the air carrier maintenance program that should be there, or it is something that is there but not producing the desired results. Alternatively, it could indicate that the maintenance program documentation is not being followed. For example, a program element that has failed and is not working or a program element that has faults and is not working as it should are deficiencies.

7) Effective. Producing or capable of producing a desired result. The maintenance program is producing the desired results when the following objectives are realized:

- Airworthy aircraft that have been properly maintained for operations in air transportation;
- Competent personnel;
- Adequate facilities and equipment; and
- All maintenance, preventive maintenance, and alterations are always performed in accordance with the certificate holder's maintenance program and manual.

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8) Establish and Maintain. "To establish" means that the air carrier develops a CASS that is appropriate for the type and scope of its operation. "To maintain" means that the air carrier keeps its CASS current and appropriate in response to changes in the type and scope of its operation.

9) Maintenance Program. The programs outlined in §§ 121.367 and 135.425, other sections of part 121 subpart L, part 135 subpart J, and described in some detail in the current edition of Advisory Circular (AC) 120-16, Air Carrier Maintenance Programs.

10) Maintenance. Inspection, overhaul, repair, preservation, and the replacement of parts, excluding preventive maintenance.

11) Performance. The act of doing something successfully; the successful execution of an action. In the CASS, performance means that the maintenance program is being accomplished or executed as outlined in the air carrier manual.

12) Person. An individual, firm, partnership, corporation, company, association, joint stock association, or governmental entity. It includes a trustee, receiver, assignee, or similar representative of any of them.

13) Preventive Action. Action to eliminate or mitigate the cause or reduce the effects of potential nonconformity or another undesirable situation.

14) Program. An organized list of procedures.

15) Responsibility. The obligation to ensure that a task or function is successfully carried out. Responsibility includes accounting for actions related to the task or function. This is a key attribute of operational control.

16) Risk. Risk is the degree of probability that hurt, injury, or loss will occur over a specific period of time or number of operational cycles. Risk has two elements: severity and likelihood. With regard to air carrier maintenance operations standards, the relationship between these two elements must be inverse.

a) Severity. The type of harm that will be inflicted if a particular event occurs. For air carrier maintenance programs, severity should be expressed in qualitative terms as a consequence of failure: safety, operational, economic, or environmental.

b) Likelihood. The estimated probability or frequency, in quantitative or qualitative terms, of an occurrence related to the hazard; an expression of the probability that a specific unsafe event will occur.

17) Risk Mitigation. A risk control measure. It refers to the process of modifying the system in order to reduce the risk.

18) Risk Management (RM). A formal process composed of identifying hazards, analyzing risk, assessing risk, and controlling risk. This process is embedded within the processes used to provide the product/service; it is not a separate process.

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19) Root Cause Analysis (RCA). The analysis of deficiencies to determine their underlying root cause.

20) System. A functionally related group of elements. In the CASS, the elements are:

- Surveillance;
- Analysis;
- Corrective action; and
- Followup.

3-3894 OVERVIEW OF A CASS.

A. Functions of the CASS. CASS functions as an air carrier maintenance program management tool that includes continuous and methodical monitoring and evaluation of an air carrier maintenance program. An air carrier's CASS uses a continuous, system-safety-based, closed-loop cycle of surveillance, data collection and analysis, corrective action, and followup to continually evaluate the performance and effectiveness of the maintenance program. Through the CASS, the air carrier ensures that it is performing the right maintenance at the right time and that it produces the intended results. The CASS is one of the tools an air carrier uses to exercise operational control over maintenance activities conducted on its aircraft.

NOTE: We cannot overstate that the CASS is a system and not a program. The primary responsibility for the CASS should be specific to an individual with the necessary authority, while coordination for the implementation of a CASS might be entrusted to a department.

1) CASS Monitors Maintenance Program Performance. The program performance (program execution) part of the CASS ensures that everyone, including all of the air carrier's maintenance providers, comply with the air carrier's manual and program and with all applicable regulations.

a) Generally, the program execution part of the CASS functions through a system of audits and investigations of operational events. The air carrier should consider each negative audit and each operational event as an indicator or symptom of a program or systemic failure. The air carrier should evaluate each one. However, depending on the results of the evaluation (risk analysis and risk assessment), every symptom or indicator may not require corrective action.

b) The program execution part of CASS should include a continuous cycle of both scheduled and unscheduled (proactive and reactive) surveillance and investigations, data collection and analysis, corrective action, and followup surveillance.

2) CASS Monitors Maintenance Program Effectiveness. The program effectiveness part of a CASS ensures that the maintenance program is producing the desired

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results. Primary indicators of the level of maintenance program effectiveness are the level of unscheduled maintenance and the rate of availability of the aircraft for use in air transportation.

a) Generally, the program effectiveness part of the CASS functions through a system of data collection and analysis of operational data that results from operation of the aircraft. An operator should collect operational data and equipment failure data, which measures the output (results) of the maintenance program.

b) Since one of the primary objectives of a maintenance program is to produce Airworthy aircraft for operations in air transportation, data sets such as the rate of aircraft availability, the rate of unscheduled landings, and the rate of schedule and dispatch reliability are useful for this purpose. An operator can collect this data in relation to a particular aircraft or a particular fleet.

c) While the FAA does not mandate the specific data an operator should collect, the FAA does expect an operator to have an effective process designed to select appropriate, relevant, and useful types of collected data. This data selection process should also ensure that any data collected is useful for its intended purpose. Moreover, a periodic review of the type of collected data ensures that the collected data remains appropriate, relevant, and useful.

B. How CASS Does It. The CASS enables an air carrier to detect and correct discrepancies in all elements of its maintenance program by proactively looking for indicators and symptoms of deficiencies and reactively looking at the results of deficiencies. CASS monitors maintenance program performance and effectiveness through a systems approach using a closed-loop system of four major activities:

- Surveillance;
- Data analysis;
- Corrective action; and
- Followup.

C. CASS Surveillance and Analysis. The regulations require that a CASS accomplish surveillance and analysis of the air carrier maintenance program from two perspectives: performance and effectiveness. An air carrier conducts the first two activities in the CASS (surveillance and analysis) in two different ways. The primary basis for one activity is audits, while the primary basis for the other is operational data collection and analysis. The results of these two types of surveillance and analysis feed into the third and fourth basic CASS activities (corrective action and followup). Table 3-124, The Major Continuing Analysis and Surveillance System Activities, summarizes the flow of the four basic activities of a CASS.

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Table 3-124. The Major Continuing Analysis and Surveillance System Activities

VERIFY PERFORMANCE OF THE MAINTENANCE PROGRAM	VERIFY EFFECTIVENESS OF THE MAINTENANCE PROGRAM
1. Surveillance: Audit process. • Create a risk-based audit plan. • Perform work-in-progress audits. • Perform transaction audits. • Perform system audits. • Identify hazards.	**1. Surveillance:** Data collection process. • Select data sets. • Collect operational data. • Collect failure data. • Identify trends, anomalies, and potential hazards.
2. Analysis: Identify hazards, accomplish risk analysis and assessment.	**2. Analysis:** Identify hazards, investigate adverse indicators, and accomplish risk analysis and assessment.
3. Corrective Action: Accomplish a Root Cause Analysis (RCA); and develop, implement, and monitor a corrective action plan (CAP), as appropriate.	
4. Followup: Verify that the corrective action was effective and initiate risk-based followup surveillance planning, as appropriate.	

1) Surveillance. The air carrier conducts surveillance so it can gather information and collect data for use in the evaluation of all elements of its program (including its maintenance providers) from two different perspectives: performance and effectiveness.

a) Surveillance to verify performance involves the use of audits, specifically work-in-progress audits used to make sure the manual and program are being followed.

b) Surveillance to verify effectiveness involves the collection of operational data and aircraft systems failure data so that the air carrier can make conclusions about the degree of effectiveness of the maintenance program.

2) Analysis of Data. Data analysis is the identification of system deficiencies (hazards) in an air carrier's maintenance program through analysis of the various kinds of data that the air carrier has chosen to collect. Data analysis is also used to verify an acceptable level of program performance or effectiveness.

a) The performance (program execution) analysis function of the CASS is carried out through the analysis of data collected during the accomplishment of audits and investigations. These audits and investigations examine the actual accomplishment of the activities and tasks of a maintenance program element relative to the standard (i.e., the air carrier manual and the maintenance program). The accomplishment of audits and analysis of audit data serve to measure program execution.

b) The effectiveness (intended results produced) analysis function of the CASS is carried out through the analysis of collected operational data. Collection and analysis of operational data allows the air carrier to measure the output of the maintenance program relative to its objectives.

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3) Corrective Action. CASS identifies deficiencies through analysis of the audit and operational data that it collects. However, based on the risk assessment performed during risk analysis, not all deficiencies will require corrective action. The level of risk might be of an acceptable level. For example, a number of mechanical delays or cancellations may be acceptable in the eyes of the air carrier. This can be acceptable as long as safety is not compromised.

a) When a CASS determines a risk to be of an unacceptable level, it will employ risk controls (corrective action) to deal with an identified deficiency and the cause(s) of that discrepancy.

b) When a CASS requires the development of a CAP, it will address the causal factor(s) and provide a solution to prevent recurrence. Within a CASS, an RCA is used to identify the central causes of an event and facilitate effective corrective actions. A CASS will implement and monitor the plan through completion.

4) Followup. Followup is the very important function that ensures the corrective action has addressed the deficiency. The followup ensures that the corrective action accomplishes what the air carrier intended it to do and connects the closed loop back to surveillance. Based on the assessment of risk, the air carrier can perform additional surveillance and/or modify data collection processes.

D. RM in CASS.

1) In concert with the attributes of a good organization, personnel, and resources for a CASS should be prioritized as part of the overall risk management process (RMP). RM facilitates the balancing act between assessed risks and practical risk mitigation.

2) RM serves to focus safety efforts on those hazards posing the greatest risks. Essentially, any methodology used to prioritize surveillance personnel and resources (as well as to formulate corrective action decisions later in the process) involves principles of RM.

3) The following elements compose a formal RMP:

- Identifying hazards;
- Analyzing risk;
- Assessing risk; and
- Controlling risk.

NOTE: The flowchart in Figure 3-131B, Overview of the Risk Management Process, summarizes an overview of the RMP. The elements of an RMP encompass the four major CASS activities (Table 3-124). You can find a detailed description of the RMP in paragraph 3-3898.

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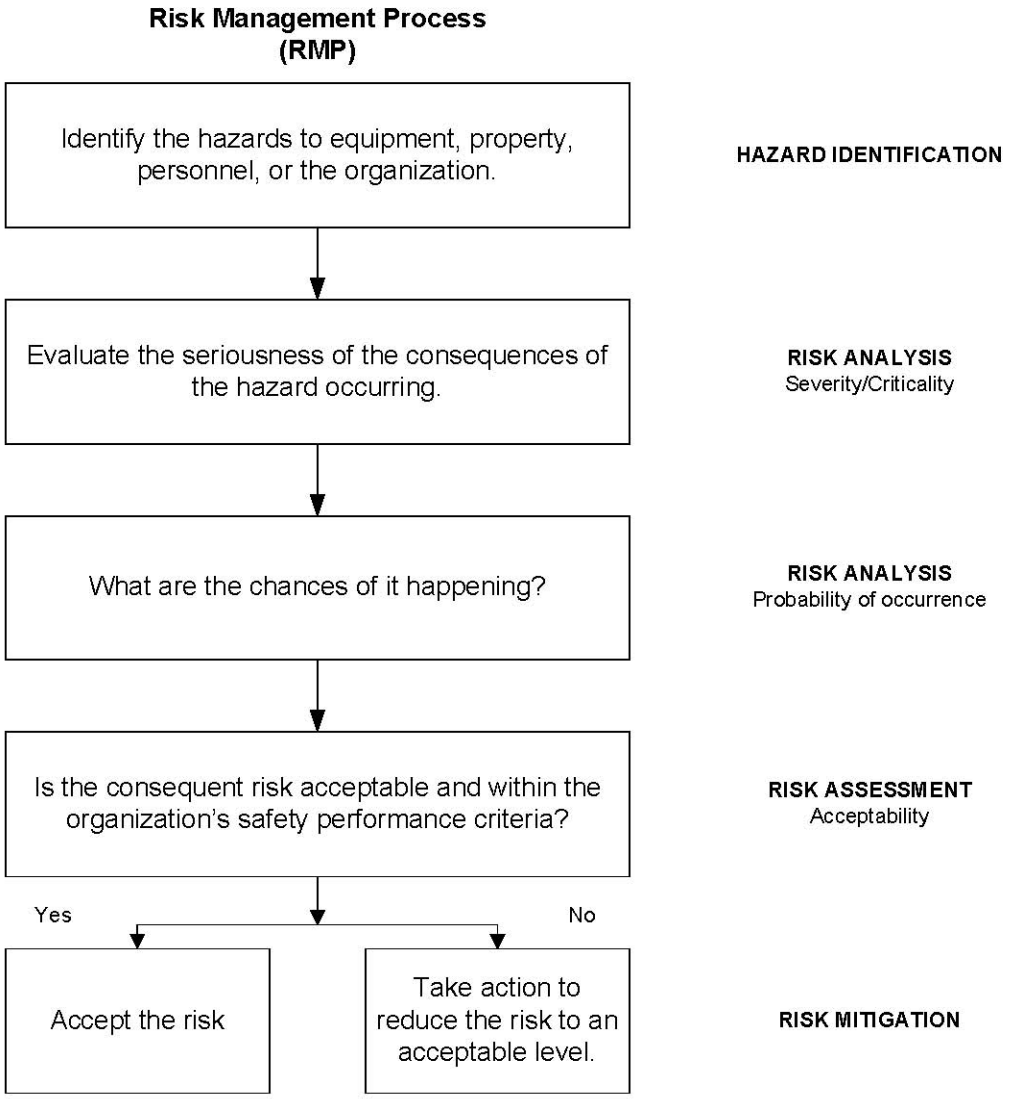
Figure 3-131B. Overview of the Risk Management Process



E. CASS in an Air Carrier's Operation. An air carrier should tailor its CASS to its individual operation. Therefore, to a large degree, what the CASS looks like will depend on the design of the maintenance organization and the size, complexity, and level of flight operations of that air carrier.

1) The basic CASS functions are always the same, but the personnel who carry out each function and the manner in which the functions are carried out will be different from one air carrier to another. For example, an air carrier with a high level of daily aircraft utilization and a very large fleet of many different kinds of aircraft may have a separate department dedicated to performing CASS activities. On the other hand, an air carrier with a fleet of 25 aircraft, operating seasonally or weekly, may find it more efficient to use its quality assurance (QA) department to perform CASS activities. An on-demand operator with few employees and one or two aircraft

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having an average annual utilization of less than 1,000 hours may contract most of its CASS activities.

2) Regardless of the air carrier's size and level of flight operations, a well-structured CASS helps an air carrier exercise operational control over maintenance activities. This involves taking a systems approach to enhancing safety and eliminating deficiencies as well as systematically determining the level of performance and effectiveness of its maintenance program. This is a key to achieving operations with the highest possible degree of safety as well as a very high degree of efficiency.

F. What CASS Examines. A CASS monitors all 10 elements of the air carrier's maintenance program. A CASS accounts for the consequences of various internal and external influences on the maintenance program. The following are examples of some, but not all, of the items within each element that a CASS looks at. You should note that all of these items are examined by the surveillance of the maintenance program performance function of CASS; this is accomplished through audits. However, in addition to real-time events such as accidents/incidents, CASS will address effectiveness discrepancies identified through the collection and analysis of operational data (i.e., RCA).

1) Airworthiness Responsibility.

a) Air carriers are primarily responsible for the performance of maintenance, including work done by maintenance providers on their aircraft. All maintenance, including work done by outside persons, must be done in accordance with the air carrier's maintenance program and maintenance manual.

b) An air carrier certificate makes the certificate holder a maintenance entity. Each person who accomplishes maintenance on a certificate holder's aircraft accomplishes it on the behalf of the certificate holder as an agent for the certificate holder. Consistent with the privileges and limitations of its air carrier certificate, air carriers, through their maintenance organization, are responsible for executing operational control over maintenance activities that anyone accomplishes on its aircraft. It is a requirement for air carriers to determine when maintenance is required, what maintenance is required, accomplishing the maintenance, determining if the maintenance was done satisfactorily, and approving its aircraft for return to service. Consistent with the regulations, an air carrier certificate holder may not delegate this responsibility to persons used by the certificate holder for any maintenance, preventive maintenance, or alterations.

2) Maintenance Manuals. CASS ensures that:

a) The content of all manuals, including maintenance manuals and technical content, is the responsibility of the air carrier. The basis of the manuals may be the Original Equipment Manufacturer (OEM) manuals or other information, but it is a requirement for the air carrier to use its own manual, not the OEM manuals.

b) Manuals, publications, and forms are useable, current, correct, and readily available to all personnel required to use them.

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c) Each person required to comply with the air carrier's manual has access to it during the performance of normal duties.

3) Maintenance Organization.

a) Consistent with the responsibility described above, air carriers must have a maintenance organization that is able to effectively exercise and maintain operational control over all persons performing, supervising, managing, and amending the maintenance program. The maintenance organization must be able to manage and guide its maintenance personnel and provide the direction necessary to achieve overall maintenance program objectives.

b) The individual with overall maintenance program authority and responsibility is the Director of Maintenance (DOM), who functions as the accountable manager for the maintenance program. The organization must clearly identify this individual within the organization and the individual must be qualified in accordance with 14 CFR part 119, §§ 119.65 and 119.67(c) or §§ 119.69 and 119.71(e), as appropriate. While retaining overall authority and responsibility, the accountable manager may delegate direct responsibility for elements of the program as appropriate for the size and structure of the maintenance organization.

c) The air carrier manual must contain a chart or a description of the maintenance organization showing clear authority and responsibility, including delegated responsibility, for the overall maintenance program and all of its elements and functions. The regulations require the air carrier to include a description in its maintenance manual of the duties and responsibilities for each position in the organization so that there is not a fragmented organizational system with high risk of confusion over who is responsible for a given task.

d) In order to be effective, an adequate maintenance organization must be able to demonstrate the following four organizational duties:

1. The duty to define the environment within which individuals conduct their tasks.

2. The duty to define the policies and procedures that individuals must follow and respect.

3. The duty to allocate the resources that individuals need in order to achieve safety and production goals.

4. The duty to investigate system failures and take all needed remedial action to avoid a repetition.

e) A maintenance organization will not be successful if it permits the following failures to occur.

1. Failure to understand the effect of people on safety and reliability of aircraft maintenance operations.

2. Failure to organize its employees' work.

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3. Failure to monitor its employees' work effectively.

4. Failure to implement corrective actions.

f) The performance of the RII function(s) must be organizationally separated from the performance of the other maintenance (including inspection), preventive maintenance, and alteration functions. This organizational separation must be below the level of the individual who has primary responsibility for the RII function, other maintenance, preventive maintenance, and alterations functions. In simple terms, this means that the part of the maintenance organization that accomplishes the maintenance (including inspection), preventive maintenance, and alterations function cannot be the same part of the maintenance organization that accomplishes your RII function.

4) Maintenance Schedule. The maintenance schedule sets out the appropriate item, task, and interval of the air carrier's scheduled maintenance effort. The FAA expects the air carrier's maintenance schedule to be task based and appropriately modified in accordance with the CASS data collection and analysis findings. The air carrier accomplishes the initial selection and the continuous validation of each scheduled maintenance task and its associated interval according to well-defined criteria throughout the service life of the item, system, or structure. The maintenance schedule is proactive and designed to permit the item, system, or structure to do what it is designed to do. Notwithstanding design issues, the level of unscheduled maintenance is a primary indicator of the level of effectiveness of the maintenance schedule.

5) RIIs.

a) The air carrier has specific procedures, standards, and limits necessary for the acceptance or rejection of each RII and for periodic inspection and calibration of precision tools, measuring devices, and test equipment. You should note that the OEM's manuals and procedures do not contain RII procedures, standards, and limits as the air carrier must develop and document these.

b) Personnel authorized to accomplish RII inspections receive proper training and qualification for each RII task that they receive the authorization to perform.

c) Designated RII inspectors who perform an item of work do not perform the required inspection on that item.

d) The maintenance organization separates the performance of the required inspection functions from the other maintenance, preventive maintenance, and alteration functions.

e) The manual contains procedures to ensure that only supervisory personnel of an inspection unit, or the person who has overall responsibility for the RII function as well as the other maintenance, preventive maintenance, alteration functions, may countermand the decision of any RII inspector regarding an RII.

6) Contract Maintenance. Vendors and suppliers have the qualifications and provide services and products according to the air carrier's maintenance program and manual.

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There should be no difference between the way work is done by air carrier personnel or by the air carrier's maintenance providers.

7) Personnel Training.

a) The air carrier must have a means to determine that all maintenance personnel, including maintenance provider personnel, are competent to accomplish their duties.

b) The air carrier has a training program for personnel (including inspection personnel and maintenance provider personnel) that determine the adequacy of accomplished maintenance.

c) The program ensures that personnel are competent to perform their duties.

8) Accomplishment and Approval of Maintenance.

a) Maintenance facilities and equipment, as well as the air carrier's maintenance providers' facilities and equipment, are adequate to perform the maintenance. Other than scope and location, there should be no difference in the standards for facilities and equipment between the air carrier and its maintenance providers.

b) Maintenance providers properly store, dispense, identify, and handle parts and components.

c) Maintenance providers properly calibrate tools and equipment.

d) Maintenance providers identify the requirements for specialized tools or training and provide training.

e) Maintenance providers perform maintenance and alterations according to methods, standards, and techniques specified in the air carrier's manuals.

f) Maintenance provider personnel properly document work interruptions and deferred maintenance in shift turnover records, and accomplish them according to applicable procedures.

g) Maintenance providers properly classify major repairs and major alterations (consistent with the 14 CFR part 1, § 1.1 meaning of major alteration or repair) and accomplish them in accordance with FAA-approved technical data.

NOTE: During 1953, the Civil Aeronautics Administration (CAA) published a list of repairs to specific parts as well as specific types of repairs that were considered major repairs in Civil Aeronautics Manual (CAM) 18. This major repair list was later adopted, unchanged, as part of 14 CFR part 43, appendix A.

h) If the air carrier relies exclusively on this standardized list of major repairs to make the major/minor classification, it will result in the classification of some minor repairs as major and the classification of some major repairs as minor simply because the list has not been

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updated to include evolving airplane design and construction techniques such as composite structures, damage-tolerant design, and the high-speed pressurized jet transport that did not exist in 1953.

i) Appropriately certified mechanics or repairmen, who are authorized by the air carrier, execute log entries and Airworthiness Release Forms.

j) Maintenance providers complete log entries and Airworthiness Release Forms according to the air carrier's written policies and procedures.

9) Maintenance Recordkeeping System.

a) Maintenance records and current status records are generated and retained in accordance with the air carrier's manual procedures.

b) Maintenance records and current status records are complete and correct.

c) Airworthiness Directives (AD) are appropriately evaluated, accomplished, and tracked.

d) Life-limited parts are identified and the current status time in service is tracked.

10) CASS.

a) CASS has four major activities that ensure, with a system-oriented, structured approach, that all elements of the air carrier maintenance program are properly executed and are consistently effective by design rather than by chance.

b) Senior management reviews CASS issues on a regularly scheduled basis. Meetings of CASS or maintenance management committees or boards are also held on a regular basis to discuss findings, analysis, and the progress of corrective actions. These meetings may address events, as well as statistical data and trends.

3-3895 PREREQUISITES AND COORDINATION REQUIREMENTS.

A. Prerequisites. Knowledge of the requirements of parts 119, 121, and/or 135.

B. Coordination. This task may require coordination between the principal maintenance inspector (PMI) and the principal avionics inspector (PAI).

3-3896 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- AC 120-16, Air Carrier Maintenance Programs.
- AC 120-79, Developing and Implementing an Air Carrier Continuous Analysis and Surveillance System.

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- AC 120-92, Safety Management Systems for Aviation Service Providers.
- FAA Order 8000.369, Safety Management System Guidance.
- FAA Order 8040.4, Safety Risk Management Policy.

B. Forms. None.

C. Job Aids. None.

3-3897 VERIFY THE CASS ORGANIZATIONAL STRUCTURE.

A. Identifying CASS Organization Positions. Identify the positions within the company that have authority and responsibility for the CASS. The definitions below have meaning within the context of an air carrier's organization. Consistent with existing regulations, there should be a chart or description of the CASS organization in the air carrier's manual.

1) Authority is a permission; it is the power to create or modify fundamental policy or procedures without higher level review or approval. Authority also means the power to accomplish a function, as well as the power to assign responsibility for carrying out the various functions of the maintenance program. The individual with authority for the CASS may design or change the CASS without having to seek approval from a higher level of management. CASS procedures should include a process to modify or revise the CASS.

2) Responsibility is an obligation that comes with accountability to ensure the successful completion of tasks and functions in accordance with applicable policies, procedures, and standards. This work may be accomplished directly by the individual with the responsibility, or the responsibility for the work may be delegated. The individual with responsibility for the CASS has the obligation to carry out the functions of the CASS, including overseeing and managing any personnel who are assigned CASS functions and duties. Note that for smaller organizations where personnel share duties and may only carry out CASS functions part time, this oversight and management responsibility relates only to those part-time tasks.

B. Authority and Responsibility.

1) An individual or position within the maintenance organization should have authority for the CASS, and an individual or position within the maintenance organization should have overall responsibility for managing and implementing the CASS. An individual may have both responsibility and authority for the CASS.

2) That individual might also have responsibility for other functions as well as the CASS. It is common for the individual with responsibility for CASS functions to delegate some or much of this work to others within the organization, depending on the size and staffing of the operator.

3) What the FAA expects is clear responsibility for the overall CASS functions so that there is not a fragmented system with a high risk of confusion over who is responsible for executing a given task or function.

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4) The potential exists for a conflict of interest between personnel managing daily operations within the carrier and those who serve in an oversight role. Personnel with CASS responsibilities and duties should be as independent as possible from the day-to-day operations of the maintenance program. Theoretically, outside personnel contracted to perform such work for the air carrier conduct the most independent, objective audits.

5) Air carrier personnel who are conducting audits should work in separate departments from the departments performing the actual maintenance activities that are being audited. However, this is not necessarily feasible for small operators. At small operators, personnel performing CASS functions, particularly audits, may consist of one or more of the following:

a) Borrowed personnel from other shops or departments. The operator's procedures should include ways to avoid having these individuals assigned to audit areas where they normally work.

b) The company owner or chief executive officer (CEO), particularly if there are no other employees and the CASS audits are focused on outside vendors and maintenance providers because all or most of the actual inspection and maintenance work is accomplished through contracts.

c) Outside resources contracted to perform audits and analysis for the company.

d) Others deemed qualified by the operator to provide the operator with an independent objective audit, operational data collection, and analysis services that fulfill the requirements of a CASS.

3-3898 VERIFY THE CASS FUNCTIONS CONCERNING RM.

A. RMP. In an effective CASS, you should be able to identify the principles of the systematic RMP that:

- Establish a plan, including the scope of the process and priorities (e.g., detect and prevent noncompliance);
- Specify the areas of concern for surveillance and analysis (personnel, maintenance and inspection programs and organizations, operations, aircraft, facilities, systems);
- Identify hazards or potential threats to the operation;
- Determine how likely such hazards are to be realized and actually cause harm;
- Determine the severity of the consequences if the hazard is realized;
- Express a combination of the likelihood and severity of harm as risk; and
- Evaluate the appropriate response to the identified risk.

B. Hazard Identification. The CASS should detect and correct deficiencies in all 10 elements of its maintenance program by proactively looking for indicators and symptoms of deficiencies and reactively looking at the results of deficiencies.

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1) The CASS should identify the deficiencies (hazards) within the air carrier's maintenance program during the analysis of data. The proactive approach for identifying deficiencies involves setting surveillance priorities based on risk assessments aimed at maintaining compliance and safety in inspection and maintenance.

2) A CASS should take into account four principal potential sources of hazards:

- Personnel (hiring, capabilities, interaction);
- Equipment (design, maintenance, logistics, technology);
- Workplace (environment, sanitation); and
- Organization (standards, procedures, controls).

3) However, a CASS may recognize hazards through actual events such as an incident or accident (a more reactive approach). These events provide clear evidence of problems in a system and therefore provide an opportunity to investigate the event and identify the hazards putting the system at risk. In practice, both proactive processes and reactive measures can provide a valuable means of identifying hazards as a CASS should evaluate them.

4) An air carrier CASS should include clear procedures for determining:

- Who will be responsible to perform hazard identification;
- What personnel training or qualifications will be required to participate in hazard identification;
- When to perform hazard identification;
- How to accomplish the determination of a hazard; and
- How to document the hazard.

C. Risk Analysis and Assessment.

1) After confirming the presence of a hazard, and keeping with the concept of managing risk to an acceptable level, risk analysis is required to assess its potential for harm or damage. Analyze, assess, and rank all identified hazards in the order of their risk potential.

2) Risk analysis and risk assessment use a conventional breakdown of risk by its two components: likelihood of occurrence of an injurious mishap and severity of the mishap related to an identified hazard, should it occur. A common tool for risk decisionmaking and acceptance is a risk matrix similar to those in the current edition of U.S. Military Standard (MS) MIL STD 882, Standard Practice for System Safety, and the International Civil Aviation Organization (ICAO) Safety Management Manual (SMM). Figure 3-131C, Sample Risk Matrix, shows an example of one such matrix. Operators should develop a matrix that best represents their operational environment. The matrix should be consistent throughout the operator's organizational structure.

3) Risk analysis.

a) The definitions and final construction of the matrix is left to the operator's organization to design. Terms that are realistic for the operational environment will define each

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level of severity and likelihood. This ensures that each organization's decision tools are relevant to their operations and operational environment, recognizing the extensive diversity in this area.

b) An example of severity and likelihood definitions is shown in Table 3-124A, Sample Severity and Likelihood Criteria. Each operator's specific definitions for severity and likelihood may be qualitative, but quantitative measures are preferable, wherever possible.

Table 3-124A. Sample Severity and Likelihood Criteria

Severity of Consequences			**Likelihood of Occurrence**		
Severity Level	**Definition**	**Value**	**Likelihood Level**	**Definition**	**Value**
Catastrophic	Equipment destroyed, multiple deaths.	5	Frequent	Likely to occur many times	5
Hazardous	Large reduction in safety margins, physical distress, or a workload such that operators cannot be relied on to perform their tasks accurately or completely. Serious injury or death to a number of people. Major equipment damage.	4	Occasional	Likely to occur sometimes	4
Major	Significant reductions in safety margins, reduction in the ability of the operator to cope with adverse operation conditions as a result of an increase in workload, or as a result of conditions impairing their efficiency. Serious incident. Injury to persons.	3	Remote	Unlikely, but possible to occur	3
Minor	Nuisance. Operating limitations. Use of emergency procedures. Minor incident.	2	Improbable	Very unlikely to occur	2
Negligible	Little consequence.	1	Extremely Improbable	Almost inconceivable that the event will occur	1

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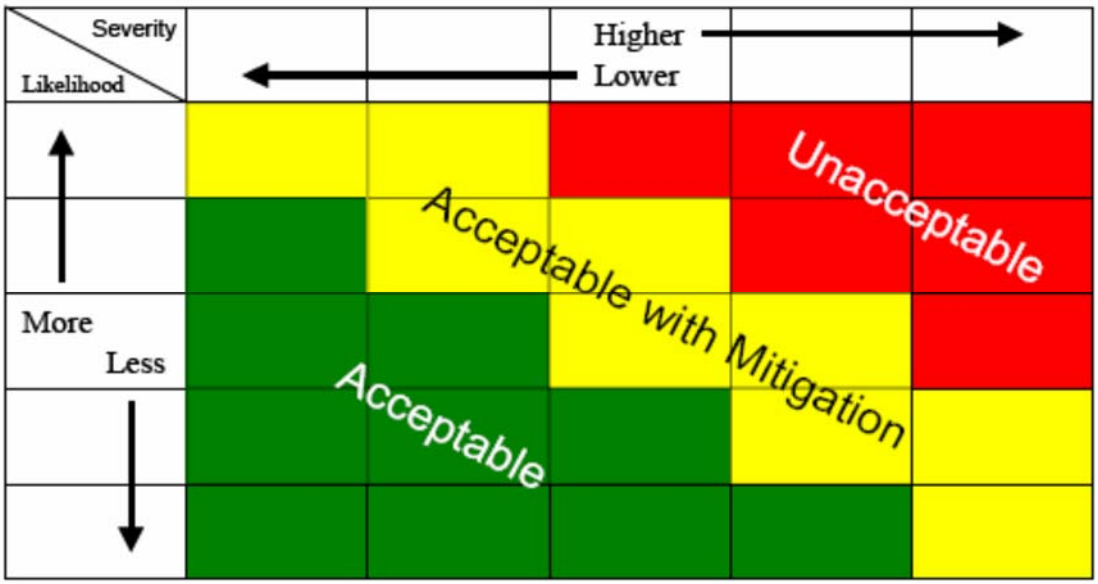
4) Risk assessment. In the development of its risk assessment criteria, we expect operators to develop risk acceptance procedures, including acceptance criteria and designation of authority and responsibility for RM decisionmaking. You can evaluate the acceptability of risk using a risk matrix such as the one illustrated in Figure 3-131C. The example matrix shows three areas of acceptability. Risk matrices may be color coded: unacceptable (red), acceptable (green), and acceptable with mitigation (yellow).

a) Unacceptable (red). Where combinations of severity and likelihood cause risk to fall into the red area, the risk would be assessed as unacceptable and further work would be required to design an intervention to eliminate that associated hazard or to control the factors that lead to higher risk likelihood or severity.

b) Acceptable (green). Where the assessed risk falls into the green area, it may be accepted without further action. The objective of RM should always be to provide an appropriate response to an identified risk.

c) Acceptable with mitigation (yellow). Where the risk assessment falls into the yellow area, the risk may be accepted under defined conditions of mitigation. An example of this situation would be an assessment of the impact of a nonoperational aircraft component for inclusion on a minimum equipment list (MEL). Defining an operational (“O”) or maintenance (“M”) procedure in the MEL would constitute a mitigating action that could make an otherwise unacceptable risk acceptable, as long as the defined procedure was implemented.

Figure 3-131C. Sample Risk Matrix



5) Assessing the risk of a hazard. CASS procedures for analyzing and assessing the risk of a hazard should include:

- Who will be responsible to perform risk analysis and assessment;
- Is the responsible person trained to perform risk analysis and assessment;

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- Specific set of criteria for how the determination will be made (i.e., detailed written procedures and a matrix);
- Who will have the authority to approve the assessment; and
- What levels of review, if any, will be performed.

6) Risk mitigation. The end result of the risk analysis and assessment is a decision: the risk is acceptable, acceptable with mitigation, or unacceptable. A risk control measure that is developed and implemented should be directly related to the final decision of the risk assessment.

3-3899 VERIFY THE CASS FUNCTIONS CONCERNING THE PERFORMANCE OF THE MAINTENANCE PROGRAM.

A. Surveillance of the Performance of Maintenance Programs.

1) The main tool for surveying whether the operator and its maintenance providers are properly performing the maintenance program is audits. An audit is a formal examination of the activities of an air carrier's or maintenance provider's departments or areas as compared to a standard, which is the air carrier's program as written in its manual. The air carrier's audits should be designed to measure an air carrier's and maintenance provider's compliance with their maintenance program requirements. The maintenance program itself must ensure that the maintenance provider accomplishes all maintenance activities in accordance with the processes and procedures of the maintenance program (§§ 121.367 and 135.425).

2) There are four types of audits usually used by air carriers. Generally, the differences are who accomplishes the audits and who the audit looks at.

a) Internal audits are performed by air carrier audit personnel on air carrier activities.

b) External audits are performed by air carrier personnel on activities of outside entities or maintenance providers.

c) A specific individual or position within a department, shop, or maintenance provider performs self-audits "in house."

d) Third parties (the FAA, Coordinating Agencies for Supplier's Evaluation (C.A.S.E.), Department of Defense (DOD), etc.) perform third-party audits on the air carrier or maintenance provider.

3) There are at least three audit methods used by air carriers. Generally, the differences are the audit objective and what the audit looks at.

a) The work-in-progress method audit is the primary type of method that we expect the air carrier to use. The purpose of these audits is to determine if the worker is following the manual. This is a requirement of §§ 121.367(a) and 135.425(a). A negative finding is a program deficiency under the CASS rules and must be addressed. This follows the plain

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language meaning of the CASS regulation (i.e., the performance of the maintenance program; are they doing what the program requires?).

b) The transaction method is used primarily for reviewing records and serves to see if the maintenance program standard for the record form, record procedures, record completion, and record accuracy standards of the program are being achieved.

4) The systems method is a high-level, comprehensive, and documented examination of all of the activities, records, processes, and other elements of an air carrier or maintenance provider's various systems, to determine their conformity with the requirements of a standard such as the air carrier's maintenance program. These audits can also identify various latent faults in the air carrier's or maintenance provider's overall systems. These audits are usually, but not always, accomplished by a professional audit agency and result in a written and detailed report that is used by senior management to make corrections to the systems.

5) The operator's auditing process should have written procedures that include the scheduling of audits. The CASS must address both internal and external audits.

NOTE: If your operator assigns an onsite representative at a maintenance provider, you should ensure that the air carrier's CASS procedures cover this individual(s)' surveillance activities. These are classed as work-in-progress audits. Typically, these individuals will observe a noncompliance with the air carrier's manual and ensure that the maintenance provider corrects the noncompliance, usually within that same day. These events must be recorded and input to the air carrier's CASS documentation system for analysis and evaluation. Otherwise, a pattern of noncompliance with the air carrier's program and manual may go undiscovered by air carrier and maintenance provider management personnel.

6) CASS procedures should include a risk-based methodology for determining priorities and for establishing and adjusting audit cycles (for example, 12-, 18-, 24-, or 36-month cycles) so that resources are focused on the most pressing issues. You should note that the RMP may show that a department or maintenance provider self-audit is applicable and effective.

7) Although the majority of the inputs to this process would be generated internally, one additional input may be the results of outside audits of the operator or its vendors conducted by entities other than the operator. For example, the results of audits or inspections conducted by the FAA or the DOD may be useful by providing an operator with:

- Specific findings requiring an RCA and possible corrective action; and
- Information useful in focusing the operator's own audits and operational data collection.

B. Scheduling Audits. The operator may approach this initial scheduling task in many different ways, ranging from resource allocation based on company experience and very basic analysis to the use of a sophisticated, software-supported risk analysis process. Within this range of possible methodologies, expect the operator's CASS audit scheduling procedures to contain

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processes to systematically make those decisions that are compatible with the size and complexity of its operations.

C. Safety and Operational Objectives. Encourage your operator to make this process as structured as possible. The operator should place priority first on safety and regulatory compliance and second on issues of operational efficiency. However, an effective CASS will meet all of these objectives.

1) To identify the areas to audit and to set priorities, the CASS process should include consideration of factors in outside reports. These factors could include inspections, reports, special studies, or audits conducted by outside entities such as the FAA, DOD, Department of Transportation (DOT), Office of the Inspector General (OIG), or National Transportation Safety Board (NTSB). Outside reports may address:

- Information specific to the operator or its vendors;
- Information related to the industry as a whole and of interest to the operator; or
- Information about an accident, incident, procedure/process, or equipment type that is relevant.

2) The operator should equip CASS auditors with checklists to ensure consistency and completeness of audits. The accountable manager for the CASS should ensure that the checklists are updated as needed. The checklists should be written in a manner that evaluates compliance with the 10 elements of the maintenance program. An auditor should also be permitted a level of flexibility to ask questions not contained in the checklist if he or she finds an area that requires further investigation.

3) An operator's procedures should include identification of all areas that need to be audited, along with a process for updating this list. The following list presents examples of areas operators should consider for routine audit. A CASS audit should verify that:

a) Manuals, publications, and forms (paper and electronic versions) are useable, up to date, accurate, and accessible to users when they are performing assigned duties.

b) Maintenance and alterations are performed according to the methods, standards, and techniques specified in the operator's manuals, including ensuring that major repairs and alterations are properly classified and accomplished consistent with technical data approved by the Administrator.

c) The maintenance provider properly stores, dispenses, identifies, and handles parts and components.

d) ADs are appropriately evaluated, accomplished, and tracked.

e) Aircraft modifications that have been installed as a result of AD requirements have not been removed or modified by subsequent repairs, alterations, or other modifications.

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f) Maintenance providers generate maintenance records in accordance with manual procedures and are complete and correct.

g) RIIs are identified and addressed according to the operator's procedures.

h) Authorized individuals execute §§ 121.709 and 135.443 Airworthiness Release Forms and log entries according to the operator's procedures.

i) Maintenance providers accomplish shift turnover records, work interruptions, and deferred maintenance according to applicable procedures.

j) Maintenance facilities and equipment, including base and line stations and contract maintenance providers' facilities, are adequate for the work that is to be done.

k) Personnel, including those of contract maintenance providers, are qualified and competent to accomplish their duties.

l) Tools and equipment are properly calibrated.

m) Requirements for specialized tools or training are met, such as for nondestructive testing, Category II/III maintenance, and run-up/taxi.

n) Computer programs for the maintenance program are used in accordance with specifications.

o) Maintenance providers, vendors, and suppliers provide services and products according to the operator's policies and procedures.

p) Each aircraft released to service is Airworthy.

4) CASS audits should be primarily proactive, searching out potential problem areas before they can result in undesirable events. However, CASS procedures should also address how to direct unscheduled audits in response to events or a series of events. For example, rejected takeoffs, unscheduled landings, in-flight shut downs (IFSD), accidents, or incidents may indicate the need for special audits or surveillance under a CASS.

5) One of the primary purposes of a CASS is to detect and analyze trends for indications of program weaknesses or deficiencies. For example, CASS auditors would not necessarily audit a single maintenance-related rejected takeoff, although the CASS would investigate the event as part of the reactive function. A CASS would, however, consider whether that instance indicated a need to focus audits on a particular area from the trending proactive point of view.

6) Auditors and analysts should maintain informal lines of communication with personnel in the other departments so that maintenance personnel can discuss concerns they may have. Through this informal communications process, the operator can learn about potential hazards in the system. For example, the operator may learn about an event that could have occurred but, because of some intervention, did not. This event would be known to shop

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personnel but is otherwise difficult or impossible to detect in routine audits. With informal lines of communication open to shop personnel, a CASS may detect this near-event. You should ensure that the operator's CASS procedures address how to encourage this type of communication and interaction.

D. Analysis of Audits.

1) Audit results should undergo an analysis to identify a deficiency or a real/potential hazard in any aspect or element of the maintenance program. The objective of the audit analysis is to allow the operator to address the problem in such a way as to avoid recurrence of the deficiencies. To the extent possible, the operator should set forth the analysis process in the CASS documentation.

2) The analysis tells operators where to allocate resources and helps them understand what was identified. RM principles should be incorporated into the analysis process. The analysis will help CASS personnel determine the level of priority that the issue merits and what type of additional technical expertise may be required to complete the RCA and evaluate corrective action options.

3) The analysis process should be as objective as possible to avoid any tendency to promote individual or commercial interests. The more thorough the analysis, the greater the likelihood the operator will uncover why the system deficiency occurred and how the organization can respond definitively.

4) The analysis process starts during the audit itself, because auditors must collect information for later analysis. If a CASS is to uncover a procedural weakness, for example, information about the procedure must be collected. This should be factual and objective information that does not contain premature judgment about a root cause.

a) Auditors and analysts should be encouraged to be inquisitive and think in terms of "what if?" so that the CASS functions proactively, detecting problem areas or trends before they can lead to an accident, incident, or infraction of regulations.

b) For example, what if event X occurred in conjunction with observed condition Y? While audits are designed mainly to verify that an operator is performing maintenance in accordance with its manual, the regulations, and applicable requirements, auditors and analysts should also be alert for systemic deficiencies.

c) There may be procedures in the manual that are correctly followed but that have become outdated, conflict with other manual procedures, or for some other reason are in need of a change. This assessment of the system design should also place priority on finding the systemic or root cause of a program deficiency over seeking to assign personal blame at any level of the organization.

d) This inquisitive approach should spread throughout the CASS organization, from determining audit priorities and scheduling through auditing and analyzing, including monitoring and evaluating corrective actions. The end result for this system assessment is seeking out the identification of new or potential hazards.

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5) The audit analysis process is typically more qualitative than the operational data analysis. Operators may find it useful to manage the collected data through database or quantitative applications. Be aware that this approach does not have to be complicated or costly. The level of formality and sophistication should match the operator's conditions.

3-3900 VERIFY THE CASS FUNCTIONS CONCERNING THE EFFECTIVENESS OF THE MAINTENANCE PROGRAM.

A. Surveillance of the Effectiveness of the Maintenance Program.

1) The main tool for assessing whether the air carrier's maintenance program is effective is the collection of operational data (data resulting from airplane operations). This way, the output of the maintenance program can be measured. However, not all operational data or information may be useful for determining maintenance program effectiveness.

NOTE: Consistent with the "effectiveness" part of the CASS regulation, the primary type of effectiveness surveillance that the operator should be accomplishing is the collection of operational data.

2) A primary goal of air carrier maintenance programs is to ensure that each air carrier aircraft released to service is Airworthy, as well as to provide the maximum level of availability for operations in air transportation. However, in order to consistently reach these goals, the air carrier must have a means of determining if the maintenance program is producing the intended results.

3) Generally speaking, at the end product level, an indicator of the effectiveness of the maintenance program is the amount of time an air carrier aircraft is not available for operations in air transportation due to issues controlled by the maintenance program. This particular effectiveness indicator can be broken down into fleet availability or individual aircraft availability, and broken down still further to the reliability of aircraft systems, subsystems, and components. In simple terms, the amount of unscheduled maintenance that reduces the availability of an air carrier aircraft for operations in air transportation is a primary indicator of whether or not the maintenance program is producing its intended results.

B. Collecting Operational Data.

1) Air carrier operational data collection systems under the CASS effectiveness activity are critical to the air carrier's ability to determine the level of effectiveness of its maintenance program. These systems should have capabilities for collecting, storing, managing, and retrieving all types of operational data that the air carrier can use to help it determine the level of maintenance program effectiveness.

2) Current systems that collect information regarding the status of aircraft structures, systems, and engines have a wide variance ranging from simple paper systems administered manually by air carrier personnel to the very sophisticated, complex, and automatic, real-time data collection systems that use information collected from sensors embedded all over the aircraft. As of this writing, there are operational data collection systems planned that will manage, and sometimes repair, system faults through automatic computer activity. Newer

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transport category aircraft are delivered with sophisticated electronic, propulsion, flight control, and structural monitoring and data acquisition systems.

3) In recent years, an increased emphasis has been placed on using these automatic data collection capabilities, in conjunction with emerging sensor, data processing, and systems status monitoring and assessment technologies, to realize real-time conditions of aircraft components. While most of these automatic systems are not well defined, the goal is to use real-time flight data to detect system flaws, defects, or abnormal operating conditions early enough to allow timely intervention.

4) The key thing to remember is that these new maintenance management systems are part of the continuing evolution of maintenance. They should be characterized as a new and different way of doing maintenance, not a means of eliminating maintenance. As maintenance is still being accomplished, these systems do not eliminate maintenance actions. They may, however, eliminate some scheduled maintenance activities.

5) Contact the Aircraft Maintenance Division (AFS-300) for specific guidance before you authorize an air carrier to use an automatic data collection system or automatic Aircraft Systems Health Monitoring and Management System.

C. Operational Data Procedures.

1) The operator should have written procedures to guide its operational data collection process. CASS procedures should include a risk-based methodology for determining the type and frequency of operational data collection so that resources focus on the most revealing data, with regard to maintenance program effectiveness. An air carrier CASS should include clear procedures for determining:

- What operational data to collect;
- Who will collect it;
- How to collect it;
- When to collect it; and
- What to do with it.

2) Operational data can be divided into routine or nonroutine data collection and analysis. The routine data element uses a proactive data collection and analysis process that seeks to identify indicators of maintenance program ineffectiveness before they can progress to a functional failure that results in a reduction in aircraft availability. Some examples are:

- Aircraft logbook information detailing unscheduled maintenance, including maintenance deferred in accordance with the MEL/Configuration Deviation List (CDL);
- “Chronic” aircraft systems that have repeat write-ups within a specified time period (e.g., 10 to 15 days);
- Corrosion prevention and control program findings;
- Engine condition trend monitoring data;

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- Individual item failure rates; and
- Mechanical Reliability Reports (MRR), Mechanical Interruption Summaries (MIS), and similar data.

3) The nonroutine operational data element is a reactive data collection and analysis process that seeks to identify indicators of maintenance program ineffectiveness after an undesirable event has occurred. Some examples are:

- Accidents and incidents;
- In-flight engine and propeller separations and uncontained engine failures;
- In-flight engine shutdowns;
- High-load events;
- Flight delays and cancellations related to mechanical issues;
- Rejected takeoffs;
- Unscheduled parts replacement or unscheduled maintenance;
- Unscheduled landings due to mechanical issues;
- Lightning strikes; and
- Hard landings.

4) As with reactive audit surveillance, a CASS generally approaches problems from the analytical, systems perspective. For example, in response to one or more rejected takeoffs, a CASS might focus the operational data collection and analysis to determine if a pattern in rejected takeoffs was evident, or a CASS might examine other types of data in relation to the rejected takeoff situation.

5) The above data sets are presented only as examples. Although the data sets are oriented toward equipment, this area of a CASS may also collect other types of data, such as information on the different types of maintenance errors experienced by the operator.

6) The operator's CASS documentation should include a means of identifying data that is relevant and useful for that operator to use in monitoring the effectiveness of its specific maintenance program. The operator should periodically review and reevaluate the usefulness of the data it collects and analyzes to accomplish this portion of the CASS.

D. Analysis of Operational Data.

1) Provide analysts with an understanding of the potential significance of each data set and how to process the data to understand its significance. This may require statistical analysis to compare the frequency of certain events, equipment failures with a determined norm, or qualitative analysis to evaluate reports of certain types of events.

NOTE: This process is not necessarily the same as what would be used in an FAA-approved reliability program.

2) Emphasize that the analysis of operational data should consider root causes of negative trends or anomalies. This preliminary RCA, including human factors, may require

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collaboration with technical personnel in the affected areas, specialists in engineering and reliability departments, or the OEM.

3) Delineate the roles of the CASS analysts as well as other departments or personnel in the analysis of operational data.

4) Some operators select a system that uses alerts or warnings if results of the analysis exceed certain predetermined parameters. A CASS should not rely completely on such alerts to the exclusion of analysts' judgment. The FAA's expectation of a CASS in this regard is that the operator has a complete, written procedure to review and analyze the operational data collected and to determine when further review is necessary.

5) While the surveillance and analysis steps differ for the verification of the performance of the maintenance program versus verification of the effectiveness of the program, the process merges when responding to CASS findings and providing a corrective action, as necessary.

6) Results from the two requirements of CASS (performance and effectiveness) identify potential deficiencies (hazards) in the maintenance program. In responding to these findings and analyses, the objective of a CASS is to determine the root causes of program deficiencies and address them appropriately, regardless of the perspective from which the deficiencies are found. Note that the discussion is focused on a CASS function, not an organization. For a given operator, that function might be performed by more than one organization.

7) Generally, the area responsible for surveillance will present their results to the technical or production area of the operator with a preliminary analysis of the collected information and, in some cases, possible underlying causes of the problem. Personnel in technical or production areas usually complete the RCA and develop proposed corrective action alternatives.

3-3901 VERIFY THE CASS FUNCTIONS CONCERNING THE CORRECTIVE ACTION PROCESS. A corrective action process is the process of interdependent activities that traces the symptom(s) of a problem to its cause, produces solutions in a timely manner for preventing the recurrence of the problem, and implements the changes. The activities within the corrective action process are:

- RCA;
- Development of corrective action;
- Implementation of corrective action; and
- Monitoring a corrective action.

A. RCA.

1) RCA applies to both audit findings and analysis of results and trends in the operational data. For example, either audits or operational data analysis may point to maintenance errors caused by inadequate training. Analysis should not stop with simply

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determining which mechanics received inadequate training and then retraining the mechanics. Rather, the analysis should determine why the training breach occurred and consider areas in management, communications, scheduling, or training program design that may be involved.

2) The key is to have a CASS structure that addresses the basic disciplines and elements involved in finding and correcting program deficiencies. The CASS procedures should note that in performing an RCA, all relevant areas should be considered, including the role of senior management in setting appropriate policies, procedures, and an environment of communication.

3) Following a systems approach, an RCA treats errors as defects in the system rather than in an individual. RCA looks beyond the symptom to find the organizational defect that permitted an error to occur, to correct the fundamental problem, and to prevent recurrence. The more thorough the analysis, the greater the likelihood that the operator will uncover why the system deficiency occurred and how the organization can respond definitively.

4) The process starts during the audit itself, because auditors must collect information conducive to later analysis. If a CASS is to uncover a procedural weakness, for example, information about the procedure must be collected. This should be factual and objective information, not a premature judgment about the root cause. RCA is a key to any complete CASS, even though procedures may vary in complexity from operator to operator.

5) Regarding the thoroughness of the analysis, the principles and considerations of an RCA are closely related to those of risk assessment. Both processes do not simply consider the person involved in an issue (e.g., the mechanic made a mistake) but all aspects of the organization within which that person works. This approach includes the premise that human error is a consequence of the system rather than a deliberate action of an individual and that proactive measures and continuous reform of different aspects of the processes and organization can address latent conditions in the system and increase the system's resistance to operational hazards. The term "latent condition" refers to flawed procedures or organizational characteristics that are capable of creating hazards if the right conditions or actions occur.

6) Ensure that the operator's procedures or corporate culture do not advocate the blame culture. The blame culture can have a significant negative effect on safe operations. Terminating the individual who has the blame assigned is usually not consistent with an effective RCA.

a) Operators that adopt the blame culture:

- Fix the blame and move on;
- Focus on the individual(s) who made the error;
- Stop short of identifying systemic problems and root causes;
- Never fix the problem; and
- Allow mishaps/mistakes to recur.

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b) Written CASS procedures for an RCA should address the following questions:

- Do documented procedures lay out when the RCA process will be used?
- What events would trigger the RCA process?
- Do procedures describe who will perform an RCA?
- Are CASS auditors and other CASS personnel trained in RCA?
- Are personnel who are developing a corrective action trained in RCA?
- Do the personnel performing an RCA have a direct knowledge of the process deficiency?
- Are there procedures specific to how an RCA will apply equally to the performance and effectiveness of CASS?
- Does management "support" RCA?
- How does an RCA address findings from outside sources?

B. Areas of Emphasis for an RCA.

1) Systems analysis plays an increasingly important role in a CASS because of the increasing complexity and variety of operations, equipment, and organizations. Systems analysis emphasizes a coordinated approach to an enterprise in terms of integrated networks of people and other resources performing activities that accomplish some mission or goal in a prescribed environment.

2) Focusing on a systems approach for identifying why a deficiency occurred, personnel working on the proposed corrective action(s) should ensure that they evaluate the characteristics within the design of a process. This approach recognizes the wide range of interrelated issues that may be associated with a problem in the system, such as management policies, communications, and pilot technique, in addition to the maintenance activities themselves.

3) Human factors analysis looks at how humans communicate and perform in the work environment and then seeks to incorporate that knowledge into the design of equipment, processes, and organizations. This enhances safety and maximizes the human contribution, partly by designing systems to anticipate the inevitability of human error. Human factors that audit checklists can address include basic issues, such as whether there is adequate lighting for mechanics and inspectors to perform their work and whether schedules permit personnel to get proper rest. But the discipline addresses a wider range of issues affecting how people interface with technology and the operational system, including:

- Human physiology;
- How people learn and perceive;
- Equipment, technology, and documentation; and
- Workplace.

4) Knowledge gained from human factors analysis can:

- Help avoid maintenance errors;
- Ensure that personnel skill sets match task requirements;

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- Ensure that skill sets are maintained and improved; and
- Enhance the work environment.

a) This knowledge can help CASS analysts perform an RCA.

b) Continuing with the previous example of inadequate training, with insufficient awareness of human factors issues, operators may trace a maintenance error to a mechanic or technician who appears to have received insufficient training for the task and determine that the solution is more technical training. However, further analysis may reveal that there are contributing flaws in equipment design, job cards, manuals, the work environment, or organizational procedures, such as shift turnover, that more training will not satisfactorily overcome. Or, it may turn out that a different kind of training, perhaps involving decisionmaking skills, is called for.

5) As of this writing, the FAA is deeply involved in cooperative efforts with industry and academia in promoting human factors in aviation. This field is rapidly evolving, particularly in its application to aviation maintenance. According to a study conducted for the FAA, which cited Boeing research, maintenance error contributes to a significant portion of air carrier accidents, with shift turnover errors and work interruptions standing out as leading underlying causes. Based on the growing importance of human factors and information available to industry, the FAA expects that operators will apply concepts of human factors to their CASS surveillance and analysis.

6) CASS surveillance also should ensure that an RCA considers human factors. Those personnel designated to respond to events such as rejected takeoffs should also include human factors as part of their investigation of individual events. Otherwise, data reviewed in a CASS may be incomplete.

7) A strong CASS will focus on safety issues and support a just culture. Although the function of the CASS is to identify and correct deficiencies in the maintenance program, an effective RCA may find inadvertent human errors that can be corrected with compliance tools, or unacceptable behavior that may require company disciplinary or FAA enforcement action. Safety-conscious and compliant individuals will naturally report, cooperate, and address mistakes, design flaws, and/or systemic issues within a culture that is just. When a fair and impartial RCA uncovers facts that identify unsafe acts that are intentional or reckless, or reflect a pattern of unacceptable risk-taking, safety-conscious individuals expect just mitigating action and accountability to take place.

C. Analytical Tools and Processes. While it is not a requirement for an operator to implement any specific externally developed system, analytical tools or processes are available to assist in the analysis process. In view of the continuing evolution of this process, as of this writing, some examples of these tools are listed below.

1) The Maintenance Error Decision Aid (MEDA) tool was developed by the Boeing Human Factors Engineering group in collaboration with the FAA, airlines, and the International Association of Machinists for analyzing human performance issues related to maintenance errors and trends. Operators use MEDA to track events, investigate and prevent maintenance errors,

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and identify contributing factors, corrective actions, and prevention strategies. A software analysis package has been developed to work with this aid and facilitate analysis of systemic issues.

2) The University of Manchester developed the Managing Engineering Safety Health tool in collaboration with British Airways Engineering. The focus of this system is researching the workplace and organizational environment in aircraft maintenance to find the issues with the greatest potential to contribute to human factors problems. The system uses software, diagnostic, and sampling tools. Managing Engineering Safety Health conducts anonymous survey-like assessments among personnel at the work location. This is a more structured, data-intensive approach toward determining and monitoring personnel attitudes toward the system than the interview process discussed earlier. The industry has far less practical experience with Managing Engineering Safety Health than with MEDA.

3) The Human Factors Accident Classification System Maintenance Extension tool was developed by the U.S. Naval Safety Center in collaboration with the FAA for use in the air carrier industry as well as naval aviation. This comprehensive system incorporates a number of analytical tools and has profiled maintenance errors and contributing conditions, permitting development of potential prevention measures. While the Human Factors Accident Classification System Maintenance Extension may be more sophisticated than many operators would need, it demonstrates principles and techniques of software-aided analysis that operators could apply to a CASS.

D. Developing and Implementing a CAP.

1) Development. After the assessment of risk and completion of an RCA, a final decision can be made on a proposed CAP. As directed by written procedures, the CAP should address the root cause of the deficiency and provide a means of verifying that the corrective action fixed the problem.

a) Responsibility/Authority.

1. A CASS should designate the position or organization responsible for evaluating and approving proposed corrective actions as well as the parties responsible for implementing, monitoring, and ensuring that all affected parties receive notification, both within the company and externally, if necessary.

2. The CASS director or other designated manager may appoint a corrective action team to design and propose a corrective action. The team, which typically represents a cross section of the departments involved in audits, operational data collection, analysis, and production, oversees the implementation of the corrective action.

3. Technical and reliability control boards are most often used in conjunction with FAA-approved reliability programs; however, a similar concept applies to a CASS, even if no FAA-approved reliability program exists.

4. The danger exists that one individual might be assigned to develop an entire CAP for which they have relatively little or no control (authority) to implement, and is

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a discrepancy in itself and must be fully addressed before any corrective action is assigned. Ultimately, the direct responsibility must always remain with the department required to address the discrepancy.

5. For example, a corrective action may require a revision to a manual. The department (inspection) that is responsible for the CAP might require the assistance of another department (technical publications) to publish the revision. Consequently, the department that is able to publish the manual would now be responsible (secondary) for publishing the manual.

6. It would be acceptable for auditors to help guide the responsible persons through the corrective action process. However, the auditors must remain independent from the corrective actions they may subsequently audit. The roles of auditors, analysts, managers, and committees should be clear when implementing the CAP.

7. The appropriate authority must accompany the responsibility if the process is to be effective. CASS procedures should address:

- Who has received the authority to develop the CAP?
- Who will be responsible to develop the CAP?
- Who is responsible to approve the CAP?
- Does the air carrier maintain the appropriate role of auditors in developing a CAP?

b) Duties.

1. The CASS procedures should identify how this plan will receive approval and at what level of the company. The CAP should address all relevant issues, including a timetable for completion of the action with milestones, if appropriate. The appropriate technical department (and other departments, such as flight operations, if the corrective action goes beyond the inspection and maintenance organizations) should then implement the plan.

2. While developing a corrective action, consideration should be made for determining the effectiveness of the corrective action. The corrective action should address what exactly would determine the effectiveness of the corrective action during the followup process. Being that the corrective action is developed to address the causal factor(s), the determination of the effectiveness should be based on what measure(s) would be used to validate the effectiveness.

3. For example, if the deficiency involved the installation of incorrect fasteners and the root cause was determined to be the lack of training, the future followup would evaluate the effectiveness of any training that might have been implemented as it relates to the deficiency. Are the incorrect fasteners being installed after training has been accomplished?

c) CASS procedures should specify that personnel will analyze a corrective action proposal carefully before its selection and implementation to ensure that corrective action is necessary and will actually fix the problem and not lead to unintended negative consequences.

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1. Air carrier procedures should instruct both the CASS and technical area personnel of the need to consider the impact of the proposed corrective action on other aspects of the operation. This includes other areas of the maintenance program, such as manuals. The corrective action may require coordination with other areas, such as flight operations, that might be affected.

2. A CASS should provide written procedures for the development of a CAP that addresses:

- When a CAP will be developed, based on risk assessment;
- How to develop a corrective action proposal with the focus being on addressing the root cause, as necessary;
- Documentation of timelines for accomplishment of tasks within the CAP;
- How will the plan be approved;
- The recordkeeping and documentation requirements of the CAP;
- How risk assessment and/or systems analysis will be used to guard against unintended consequences; and
- How the effectiveness will be determined during the followup process (as necessary).

3. In some cases, the operator may require data or assistance from a manufacturer to help correct a deficiency detected by the CASS. The operator should offer guidance in its CASS procedures, based on its particular experience, on how CASS and other personnel should address the need for assistance or information from manufacturers, and how to proceed in case of unsatisfactory or slow responses. This may include developing a standardized letter citing the need for this information or assistance to satisfy the requirements of § 121.373, § 135.431, or other pertinent regulations. It may also include working with the FAA principal inspector (PI) to find solutions.

2) Implement the CAP. After development of a CAP, the responsible individual(s) must implement the plan. The importance of actually implementing the plan cannot be overstated. The completion of the corrective action must occur so that the discrepancy is addressed and the necessary followup surveillance can occur so that the effectiveness of the corrective action can be determined.

a) Responsibility/Authority.

1. The danger exists that one individual might be assigned to implement an entire CAP for which they have relatively little or no control (authority) to implement, and is a discrepancy in itself and must be fully addressed before any corrective action is assigned. Ultimately, the direct responsibility must always remain with the department that is required to address the discrepancy.

2. For example, a corrective action may require a revision to a manual. The department (inspection) that is responsible for the CAP might require assistance from another

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department (technical publications) to publish the revision. Consequently, the department that is able to publish the manual would now be responsible (secondary) for publishing the manual.

3. In the event that a CAP requires changes, procedures should assign authority to specific individuals to enable them to make changes to the plan.

4. It would be acceptable for auditors to help guide the responsible persons through the corrective action process. However, the auditors must remain independent from the corrective actions that they may subsequently audit.

5. The roles of auditors, analysts, managers, and committees should be clearly defined when implementing the CAP.

6. The appropriate authority must accompany the responsibility if the process is to be effective. CASS procedures should address the following questions:

- Who will be responsible for implementing the CAP?
- Who is responsible for making changes to the CAP?
- Who will determine when the CAP has been completed?
- Does the air carrier maintain the appropriate role of auditor when implementing a CAP?

b) Duties. Accomplishment of these duties is essential to the success of a CAP.

1. CASS procedures should ensure that the corrective action is implemented. Procedures should specify how to implement the plan from the time of development to closure.

2. The CAP should be specific as to what is expected to occur or to be accomplished. Clear timelines should document the completion of specific actions within the plan. For example, a CAP might have numerous actions that must occur in order to complete the plan, perhaps in a sequential order.

3. It is essential that communication exist throughout the corrective action process. Procedures should include guidelines for how the technical area will communicate the status of the corrective action to the person responsible for monitoring implementation. Also, procedures should provide all parties involved with what will constitute a closure of individual action items within the plan and/or the plan in whole.

4. The procedures for auditors, analysts, managers, and committees should be clearly established if the process is to be effective. CASS procedures should address the following questions:

- How will the implementation of a CAP be accomplished?
- How will changes to the documented plan and/or timeline be addressed?
- When will individual action items within the CAP and/or entire CAP be considered “closed”?

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3) Monitoring the CAP.

a) Under the CASS, monitoring of the CAP should be a documented and systematic approach towards ensuring the implementation of the documented CAP. Without documented procedures for monitoring the CAP, the possibility exists that corrective action will not be implemented.

b) Furthermore, if a corrective action was developed to mitigate or eliminate causal factors and was not implemented, the effectiveness of the corrective action could not be measured and the causal factors would still exist. CASS procedures should ensure that the corrective action was completed.

c) Responsibility/Authority.

1. An identifiable individual or entity (such as a CASS board) should be given the overall responsibility and authority for monitoring the status of the CAP. CASS auditors or analysts may have the direct responsibility of ensuring that the corrective action has been completely implemented in accordance with the established timetable or, if not, determining why the timetable has changed.

2. Responsibilities should include determining if any changes in the corrective action are acceptable, as well as who will make the determination for plan closure.

3. The roles of auditors, analysts, managers, and committees should be clear when monitoring the CAP. The appropriate authority must accompany the responsibility if the process is to be effective.

4. CASS procedures should address:

- Who will monitor the status of the CAP?
- Who will approve changes to the CAP?
- Who will determine when the CAP has been completed?

d) Duties. The following procedures are essential to the success of the corrective action:

1. CASS procedures should ensure that the corrective action was completed. Therefore, procedures should specify how the plan will be monitored from the time of implementation to closure.

2. The means for tracking the corrective action against a timeline will vary between operators, and methods are normally dependent on the policies of the operator. Monitoring the plan may be accomplished through the use of electronic media and/or paper media. Procedures should identify what method or methods will be used to monitor the implementation of the CAP.

3. Effective communication must exist between the owner of a CAP and the individual who is monitoring the plan. Procedures should include clear guidelines for

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communicating the status of the corrective action from the affected technical area to the individual responsible for monitoring implementation. Also, procedures should provide all parties involved with a clear performance standard for closure of individual action items within the plan and/or the plan as a whole.

4. Auditors, analysts, managers, and committees must have clearly established procedures if the monitoring process is to be effective. CASS procedures should address the following questions:

- How will the CAP be tracked (monitored) in accordance with the timeline?
- How will automation or computerized systems be used to monitor the implementation?
- How will changes to the documented plan and/or timeline be addressed?
- When will individual action items within the CAP and/or entire CAP be considered "closed?"

E. Verify the CASS Functions Concerning the Followup Process.

1) At the beginning of the corrective action process, a risk-based determination was made to mitigate or eliminate the associated risk. This determination led to the development and implementation of a CAP (risk control).

2) When a CAP included an RCA, the primary goal of the CAP would have been to prevent recurrence of the discrepancy. To be effective, the plan would have specifically addressed the identified causal factor(s).

3) Additional surveillance or data collection may be necessary to validate the effectiveness of the CAP. The followup surveillance plan is the means by which the effectiveness is validated and has two principles: verifying the effectiveness of the CAP and additional surveillance planning (auditing and/or data collection).

a) Responsibility/Authority.

1. An identifiable individual or entity (such as a quality organization) should be given the responsibility and authority for performing the followup of the CAP. CASS auditors or analysts may have the responsibility for making a determination of the effectiveness of the CAP and may sometimes determine that the corrective action was not effective and requires additional action(s).

2. The roles of auditors, analysts, managers, and committees should be clearly defined in the CAP process as well as the additional surveillance planning process. The appropriate authority must always accompany the responsibility if the process is to be effective.

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3. CASS procedures should address the following questions:

- Who will validate that the CAP was effective?
- Who will approve changes to the surveillance planning or immediate actions?

b) Duties.

1. Performance measures to evaluate the effectiveness of the corrective action should be specific. The performance measures should have been established during the development of the CAP and should provide the information necessary to determine the level of action plan effectiveness.

2. Verifying the CAP effectiveness may require a one-time audit or could require a series of frequent audits. CASS procedures should include how to determine the level of followup audits for verifying corrective action implementation. For example, based on the risk assessment or complexity of the corrective action, the designated CASS analyst or team may schedule special, less frequent, or more frequent audits.

3. They may also change the data collection process or institute other means of verification. The FAA expects the operator to have a well-designed and logical process to design the followup actions.

4. The accomplishment of the followup process should be verifiable. The operator should document the outcome of the process. This documentation should provide enough information to be able to conclude that the process has been accomplished.

5. The procedures for auditors, analysts, managers, and committees should be clear if the process is to be effective. The methodology will probably vary from one operator to another, but the principles should be evident and verifiable in written procedures.

6. CASS procedures should address:

- What measures will be used to evaluate the effectiveness of the corrective action, including identification of data to be collected, awareness of the possibility of unintended consequences, and events that should trigger a response;
- When and/or how often the followup will occur;
- How to use the automation or computerized systems to document the followup process; and
- How to determine changes to surveillance planning and/or data collection.

F. Analyze Results. Upon completion of the review/surveillance, analyze the results and determine if the operator/applicant's CASS meets all of the requirements. If there are deficiencies, initiate collaborative discussions with the operator/applicant to resolve the issues.

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3-3902 TASK OUTCOMES.

A. Complete the PTRS Record (if applicable).

B. Complete the Task. Complete ATOS SAI or EPI DCT, as appropriate, for the CASS Element 1.3.11. Successful completion of this task will result in the acceptance of the CASS program or revision and/or a determination that the CASS is being performed properly and is producing the desired results.

C. Document the Task. File all supporting paperwork in the operator/applicant's office file.

3-3903 FUTURE ACTIVITIES. Normal surveillance.

RESERVED. Paragraphs 3-3904 through 3-3915.

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VOLUME 3 GENERAL TECHNICAL ADMINISTRATION

CHAPTER 55 PART 145 REPAIR STATIONS

Section 1 Review and Approve a Part 145 Repair Station's Training Program

3-4461 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.

A. Maintenance: 3230, 3396, 3397.

B. Avionics: 5230, 5396, 5397.

3-4462 OBJECTIVE. This chapter defines the terms and requirements for approval of a repair station's training program under Title 14 of the Code of Federal Regulations (14 CFR) part 145 by the responsible aviation safety inspector(s) (ASI). It also explains the policies and procedures applicable to repair stations of varying size and complexity.

3-4463 DEFINITIONS.

A. Course. A course is a set number of lectures, materials, or number of hours of study in a particular subject. For example, a course under the initial course of study for managers and supervisors may be "Repair Station Manual, Policies, and Procedures."

B. Course of Study. A course of study, or curriculum, is a series of related separate courses in a subject area, such as the initial course of study for managers and supervisors.

C. Course Outline. A course outline, or syllabus, outlines the entire subject presented in an individual course. The course outline for the "Repair Station Manual, Policies, and Procedures" course may include the modules devoted to the Repair Station Manual (RSM), repair station policies, and repair station procedures, with each module further broken down into subjects. For example, the "procedure" module could include "Recordkeeping Procedures, Timekeeping Procedures, and Facility Security Procedures."

D. Course Module. A course module is a set, logical, self-contained unit of a course. A course module may be given in one training session or lecture or spread over more sessions. Modules of the "Repair Station Manual, Policies, and Procedures" course may be: "The Repair Station Manual;" "Repair Station Policies;" and "Repair Station Procedures."

E. Courseware. Courseware is instructional material developed for each curriculum, such as lesson plans, instructor guides, computer software programs, audiovisual programs, workbooks, aircraft or article technical manuals, and handouts. Courseware must accurately reflect curriculum requirements, be effectively organized, and be properly integrated with instructional delivery methods.

F. Employee Training Record. The training record is the employee file in which all training is documented and retained for Federal Aviation Administration (FAA) review for a minimum of 2 years.

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G. Indoctrination. Indoctrination, or orientation, is part of the initial training for all incoming personnel on general procedures that are unique to the repair station's operation, maintenance and inspection systems, and regulatory compliance requirements. Indoctrination establishes a common core of knowledge among employees.

H. Initial Training. Initial training establishes new employee technical skill level and is adjustable based on an assessment of their training, experience, and relevant certificates held. However, whenever changes to repair station ratings, new tools and equipment, materials, and new methods, techniques, and practices are introduced to current employees as recurrent training, the initial training requirements for new employees should be updated, and existing employees should be provided abbreviated initial training on the new information.

I. Instructor. An instructor is an individual competent in the training methods, techniques, and practices, and familiar with the subject being taught.

J. Recurrent Training. Recurrent training is repetitive training at specific intervals to refresh employee knowledge of repair station policies, programs, and regulatory requirements. Alternatively, changes to repair station ratings, new tools and equipment, materials, and new methods, techniques, and practices may be imparted to existing employees through recurrent training.

K. Task. A task is a piece of work to be done, an individual task that is part of the maintenance, preventive maintenance, and alterations required to return an article to service under the privileges of the repair station certificate and rating as assigned by appropriate management or supervisory personnel.

L. Task Levels. Task levels are the areas defined in an article's technical data that comprise the division between maintenance, preventive maintenance, alterations, inspections, overhauls, and other definitions, and provide a clear indication of when a set of tasks is different from another set of tasks.

M. Testing and Checking. Methods for evaluating employees as they demonstrate a required level of knowledge in a subject and, when appropriate, apply the knowledge and skills learned in instructional situations to practical situations.

N. Training Categories. Training categories identify a distinct course of study such as indoctrination, initial, recurrent, remedial, and specialization training.

O. Training Hours. Training hours include the total amount of time necessary to complete the training required by a curriculum segment. This must provide an opportunity for instruction, demonstration, practice, and testing, as appropriate.

P. Training Methods. Training methods identify how the training will be conducted and include formal classroom, computer-based, on-the-job, distance learning, and embedded training.

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Q. Training Program Characteristics. The training program characteristics are features of an overall good training program or good training program element, such as a needs assessment and program review.

R. Training Program Elements. An entire training program is made up of a number of different elements, such as the recordkeeping system, the initial course of study for managers and supervisors, or the recurrent course of study for inspectors.

S. Training Sources. Training sources identify who conducts the training. Possible training sources are original equipment manufacturers, Aviation Maintenance Technician Schools (AMTS), operators and other repair stations, government agencies, and trade associations.

3-4464 BACKGROUND.

A. Prior to August 2001 Rule Change. Before the August 2001 Final Rule change, part 145 requirements did not specify training requirements for personnel involved in the repair of aircraft, accessories, or components that are returned to service by repair stations. Exceptions to the training program requirement were focused on those repair stations that performed maintenance, preventive maintenance, and alterations for 14 CFR parts 121 and 135 air carriers and those repair stations that were European Aviation Safety Agency (EASA)-accepted.

B. Contracted Work. The state of aircraft maintenance has undergone a great deal of change. There is a trend for air carriers to contract work out to repair stations. This is done often for heavy maintenance that is either in excess of the air carrier's capacity, and for a specific aircraft type of which few are in operation, or for a number of specific major repairs and alterations.

C. Repair Station Training Program. With the implementation of new repair station requirements, adoption of a training program for repair station employees who perform maintenance (including inspection), preventive maintenance, and alterations would enhance aviation safety by helping to ensure that those employees are fully capable of performing the work. It also promotes a level of safety equivalent to that of maintenance performed under parts 121 and 135.

3-4465 BASIC FORMAT REQUIREMENTS.

A. Training Program Purpose. The purpose of the training program is for the repair station to:

- Comply with the regulatory requirements of part 145, § 145.163;
- Provide the training necessary for employees to perform their job functions efficiently, safely, and correctly; and
- Familiarize employees with the RSM, quality systems, and procedures.

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B. Training Program Manual. The RSM or training program manual must include procedures required by the regulations for revising the training program. It must also include procedures for submitting those revisions to the certificate-holding district office (CHDO) for approval.

C. Locations Outside the United States. Repair stations located outside the United States should submit the repair station training program in English.

D. Procedures. The procedures should address how often the program will be reviewed to determine if it is current and adequate for the type of maintenance being performed at the facility. Because advancements in technology can cause aviation maintenance to change rapidly, a periodic review of training needs is appropriate. The procedures should include who will be responsible for planning recurrent training and any new training that may be necessary. Repair stations that have established a management review program should include the training program for review during that meeting.

E. The Principal Inspector (PI). The PI must review the initial or revised procedures in the certificate holder's or applicant's program submission. These should not be considered all inclusive. Each facility is unique and may require additional procedures to verify regulatory requirements and the needs of the repair station. Procedures may address the following:

- Who in the repair station is responsible for submitting the initial training program and subsequent revisions to the FAA?
- When will the revisions be submitted?
- How will the revision be approved (include the company approval as well as FAA)?
- How often will the repair station review training program currency and completeness?
- Who in the repair station will perform this review?
- How will the repair station record and implement revisions?
- How will the revised text be identified and program materials updated?

3-4466 PREPARATION.

A. Inspector Responsibilities. Each PI will need to become familiar with the operation of the repair station prior to reviewing and approving a repair station's training program submission. This is primarily due to the diversity in the certificate holder's size (physical size and numbers of employees), ratings, capabilities, contract activities, and personnel experience and skill levels. The PI should consider all of these to determine if the certificate holder's training program meets the regulatory requirements in this chapter.

B. Certificate Holder Responsibilities. The certificate holder is responsible to ensure that the training program continuously reflects the repair station's capabilities and the work its employees perform. Changes to any of the repair station's capabilities may constitute the need to revise the training program. Some of these capabilities include:

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- Certificate ratings, privileges, and limitations;
- Maintenance functions performed;
- Personnel, position, ability, experience, and skill level;
- Tools, equipment, and materials;
- Procedures, methods, techniques, and practices;
- Contractual arrangements with an air carrier or operator;
- Contracting maintenance services;
- Regulatory requirements; and
- Certificate holder's RSM and quality system requirements.

C. Training Program Structure.

1) Repair Station Needs Assessment. The repair station's needs assessment procedures enable the repair station to identify its training requirements based on job positions, duties, and tasks. It also establishes an objective method for determining training standards, assessing the capability of its employees, and establishing training programs for its employees to fill the gap between position/skill/task requirements and employee capabilities. Procedures associated with the repair station's needs assessment will be based on its size, employee hiring, assignment and training practices, customer bases, and the complexity of its ratings and scope of operations. The repair station should establish the basic standard that identifies the individual employee's training needs by assessing the job functions and duties against the employee's specific skills and knowledge. The repair station can then assign training areas, programs, and lessons to fill any gaps between the skills and knowledge needed for the job tasks and the employee's capabilities.

a) The program description should include the processes the repair station will use to identify its training requirements for ensuring each individual assigned to perform maintenance (including inspection), preventive maintenance, and alterations tasks is capable of performing the job properly. The training needs assessment is a method of analyzing the job tasks associated with the repair station's maintenance and alteration positions. This entails identifying the knowledge and skills required to successfully fill positions that perform maintenance and alteration tasks. In addition, when determining its training requirements, a repair station should analyze the nature of its business structure and its customers.

b) When identifying overall training needs, the repair station will consider:

- The tasks associated with each position responsible for performing maintenance, preventive maintenance, or alteration;
- The skills, experience, and training of new and current employees;
- How assessments will be made of employees being assigned new tasks;
- The return of an employee to tasks after an extended period;
- The introduction of new regulations, procedures, equipment, or recordkeeping requirements; and
- Change in the nature of basic repair station capability.

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c) The needs assessment reviews the repair station's training requirements in the context of its existing staff's capability and tasks associated with specific work assignments. Based on the outcome of its training needs assessment, the repair station can develop and revise its areas of study and/or courses. The training needs assessment should identify the requirements for initial and recurrent training. Based on its needs assessment, the repair station will determine the type and extent of training needs for the company and for individual employees.

2) Employee Needs Assessment.

a) The repair station's procedure should evaluate the current capability of its repair station employees, both technical and nontechnical. Only those performing maintenance or alteration tasks must be trained under part 145; however, the repair station may wish to include employees that support or manage technical personnel. The training program should differentiate between those employees that require training under the program and those that will receive training in accordance with the procedures at the repair station's discretion. Once the repair station assesses a technical employee's capabilities, it will identify employee-specific training needs.

b) When carrying out any assessment of an individual's capabilities, the repair station's process should be as objective as possible and structured to produce consistent results. The repair station should establish the standard skill level and qualifications for assigned tasks under the job function or position, then establish objective methods for comparing an individual's capability to those standards. It may be necessary for the repair station to use more than one method to adequately assess an individual's capability. The repair station should also have procedures to accept prior experience, training, or education to establish an individual's capability. For example, a repair station may accept graduation certificates from a 14 CFR part 147 school and/or an Airframe and Powerplant (A&P) certification as acceptable evidence of a basic knowledge and skill level in a particular area. A repair station could also have procedures for accepting certificates from previous training by manufacturers, associations, or military records. The repair station should have procedures to ensure the following:

- The assessment is objective-based and consistent;
- The individual's training records document the assessment;
- The individual conducting the assessment is qualified to evaluate the results of the assessment; and
- The individual is capable of performing the tasks consistently at an acceptable level and assigning necessary initial, recurrent, or remedial training.

3) Indoctrination. Indoctrination training should consist of the repair station's specific operations and procedures. This is core training for all repair station personnel. The scope and depth of indoctrination training may vary based on the individual's assigned position. However, indoctrination training should be similar for all employees to establish a standard core of knowledge. The repair station should determine the level of indoctrination training required for each job assignment through its training needs assessment process. The training program should address the following subjects, regardless of the repair station's size or ratings:

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a) Title 14 CFR requirements, particularly those associated with the repair station maintenance functions and authority as reflected on the certificate and operations specifications (OpSpecs).

b) Company manuals, policies, procedures, and practices, including quality control (QC) processes, particularly those associated with ensuring compliance with maintenance (including inspection), preventive maintenance, and alteration procedures established to show compliance with part 145.

c) Department of Transportation (DOT) hazardous material (hazmat) requirements, general Occupational Safety and Health Administration (OSHA) and Environmental Protection Agency (EPA), and other local, State, and Federal laws requiring training for different categories of employees.

NOTE: The repair station must not confuse employee hazmat familiarization and training (Title 49 of the Code of Federal Regulations (49 CFR) part 172 subpart H) with the regulatory requirement of DOT 49 CFR part 171, § 171.8 hazmat employee/hazmat employer training standards, which require mandatory hazmat training for those personnel engaged in the shipping of hazmats.

d) Maintenance human factors. Training in maintenance human factors is an essential part of an FAA-approved training program. The repair station's submitted training program and any revision thereto must include human factors elements. The FAA will not prescribe what human factors elements to include, but those elements should focus on aviation maintenance and safety-related issues. If human factors were not included, their exclusion would hinder the training program approval. (Refer to the current edition of Advisory Circular (AC) 145-10, Repair Station Training Program, for additional information.)

e) Computer systems and software, as applicable to the repair station's maintenance (including inspection), preventive maintenance, and alteration systems and procedures.

f) Facility security.

NOTE: Some of the subjects listed above do not fall under the direct purview of the FAA or the Flight Standards Service (AFS).

NOTE: Regardless of the experience level of incoming personnel, indoctrination on procedures unique to the repair station should ensure a smooth transition into the work environment. The repair station should schedule this phase of training within a reasonable time after hire to ensure that the employee understands the repair station's operations.

4) Initial Training. This training should consist of all the technical subject areas and be consistent with the specific employee's position and assigned job activities.

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a) The repair station's technical training areas of study may be separate and distinct from indoctrination training and may apply to different categories of employees within a given job position. Technical training requirements should focus on providing employees with the appropriate skill or task training required to properly perform job position assignments.

b) The repair station should have procedures to determine the applicable scope and depth of initial and/or recurrent training based on each job assignment and each employee's experience and capability established by the needs assessment. The needs assessment is the basis for determining an individual's initial and recurrent training requirements.

c) When developing the initial or recurrent training courses, the repair station may want to take into account that individuals will not have the same training, experience, and skill level. For example, when developing its initial course of study for technicians, a repair station may want to have separate programs for:

- Individuals that hold an A&P certificate;
- Individuals with experience performing similar tasks at another repair station;
- Individuals with applicable military aviation maintenance experience; and
- Individuals with no skills, experience, or knowledge.

d) A repair station may have more than one training course for its employees. For example, initial training for new repair station technicians with limited repair station experience may include the following in-depth courses:

- Maintenance human factors;
- Tools;
- Test equipment, including ground support equipment;
- Materials and parts;
- Records and recordkeeping;
- Specific hazmat, OSHA, and EPA requirements;
- Shop safety; and
- Specific job or task training.

NOTE: Training in maintenance human factors is an essential part of an FAA-approved training program. The repair station's submitted training program and any revision thereto must include human factors elements. The FAA will not prescribe what human factors elements to include, but those elements should focus on aviation maintenance and safety-related issues. If human factors were not included, their exclusion would hinder the training program approval. (Refer to AC 145-10 for additional information.)

e) In contrast, initial training for new technicians with prior repair station experience may include a general review of the same subjects as necessary and detailed technical training only for specific job or task assignments. In all events, the repair station should establish an individual's specific training requirements based on a needs assessment. Additionally, whenever introducing new information on the topics, the repair station should update the initial

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training requirements for new employees and provide existing employees with abbreviated initial training on the new information. Alternatively, the repair station may impart the additional information to existing employees through the recurrent training requirements.

f) The time devoted to initial or recurrent training can vary depending on the level of experience of the individual and skills and knowledge associated with the assigned job or tasks. However, the repair station should establish a basic minimum standard for all employees in a specific job position, whether through training given by the repair station or knowledge acquired through other sources. For example, the repair station could establish minimum time requirements for training or, alternatively, could assess the need for training based upon skills and knowledge testing. In either event, the repair station training program must ensure that the employee is capable of properly performing assigned tasks.

NOTE: Some of the subjects listed above do not fall under the direct purview of the FAA or AFS.

5) Recurrent Training. This training program element should provide procedures for recurrent training of subject areas relevant to a repair station employee's job function in order for them to remain current within their assigned job activities.

a) Recurrent maintenance training commonly includes training, known as refresher training, to ensure that a repair station employee remains capable of properly performing the assigned job. The repair station's program should define the terms "initial" and "recurrent" and identify the areas of study and/or courses/lessons that it will provide under the two definitions. The definitions should be associated with either the person receiving the training or the training course or information being offered. The repair station should have procedures to determine the recurrent training requirements for each job assignment or employee. Not all job assignments will have the same recurrent training requirements. The repair station may also wish to provide a procedure for determining when training is not required to ensure an employee is capable of performing assigned tasks.

b) The repair station should have procedures to determine the type and frequency of recurrent training for each of its employees through the needs assessment. The repair station may also need procedures to develop one-time recurrent training courses when there are changes to the subjects of initial training. Alternatively, or in addition, the repair station may define standard recurrent training that it will provide on a regular basis to address any subject provided in initial training. If the repair station provides new information on initial training requirements to existing employees under the recurrent training system, its program procedures should set forth two different types of recurrent training:

1. That which updates the initial training requirements on a one-time basis, and

2. That conducted on a regular basis (refresher training).

c) Each repair station's recurrent training program should differ as it should be based on the repair station's needs assessment, which will take into account its size, employees, customers, and complexity of ratings and operations.

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6) Specialized Training. The repair station should have procedures to identify job assignments that will require special skills or have complexity that would require the development of specialized training to ensure capabilities. Some areas that may require specialized training include flame and/or plasma spray operations, special inspection or test techniques, special machining operations, complex welding operations, aircraft inspection techniques, or complex assembly operations. Individuals who attend specialized training and develop competency in a particular job assignment or task should be able to convey the information to other employees. The repair station's training program should address the initial and recurrent training requirements for any task or assignment that it determines requires specialized training.

7) Remedial Training.

a) A repair station should have procedures to determine an individual's training requirements, including when it will provide an employee with remedial training. The repair station should use remedial training procedures to rectify an employee's demonstrated lack of knowledge or skill by providing information as soon as possible. In some instances, remedial training may consist of an appropriately knowledgeable person reviewing procedures with an employee through on-the-job training (OJT). The repair station should design remedial training to fix an immediate knowledge or skill deficiency and may focus on one individual.

b) Successful remedial training should show an individual what happened, why it happened, and how to prevent it from happening again in a positive manner. Remedial training may be included in the repair station's definitions of initial or recurrent training requirements.

8) Training Documentation. Training program documentation should be tailored to the repair station's size and job assignments, complexity of capabilities, and maintenance functions.

a) The repair station must document, in a format acceptable to the FAA, the individual employee training records set forth in the manual approved by the FAA under § 145.163(a). The capability of each employee depends on training, knowledge, and experience. Consequently, the determination by the repair station that an employee is able to perform the maintenance, preventive maintenance, or alteration assignment requires an analysis of the factors that contribute to the employee's capability. The data to accomplish this analysis should be found in the employee's training records if the principles of this chapter are followed when the training program is developed.

b) The repair station may retain its training records electronically or in hardcopy. In either case, the repair station should standardize the format and content for the training records based on individual job assignments. However, each employee's records should contain at least:

1. The employee's name and job position.

2. Training requirements as determined by the needs assessment, including requirements for indoctrination, initial, and other training required by areas and course titles.

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3. FAA certificates applicable to the qualifications. For example, supervisors, Required Inspection Items (RII) personnel, and persons approving articles for return to service must be certificated under 14 CFR part 65, excluding those repair station personnel located outside the United States and its territories (see paragraph 3-4467).

4. Other certifications, diplomas, and degrees.

5. Authorizations and qualifications (if not covered by part 65 certificates).

6. Proof of training course completion, if determined applicable to capabilities.

7. List of accomplished training, to include enough information to determine whether it is applicable to the employee's capability to perform assigned tasks:

- Course title or description,
- Course objective,
- Date completed,
- Test results,
- Total hours of training,
- Location of training,
- Name of instructor and/or instructor qualifications, and
- Signature of employee.

8. Other documentation relevant to determining capability to perform tasks associated with assigned duties, such as past employment, knowledge, oral, and practical tests results, etc.

c) All records that are required by the training program to determine whether an employee is capable of performing assigned tasks as well as those that document training conducted by the repair station should be considered those required by § 145.163(a). Therefore, the training program should detail these records and retain them for a minimum of 2 years. The repair station is encouraged to have procedures to regularly review all training records to ensure they comply with the requirements set forth in the training program manual.

D. Measurement of Capability. The training program should have methods to identify current levels of capability and methods for monitoring and managing capability.
Section 145.163 requires that "the training program must ensure each employee assigned to perform maintenance, preventive maintenance, or alterations, and inspection functions is capable of performing the assigned task." Organizations should have a mechanism for determining capability of employees for all areas (both technical and non-technical) in which an employee is required to be competent. Assessing capability in the practical application of tasks and maintenance functions is difficult; therefore, it may be appropriate for the repair station to apply a selection of the mechanisms listed below.

1) Examination. A good mechanism for assessing knowledge, but not necessarily the capability of applying knowledge in a work context.

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2) Interview.

3) Qualifications. A good source of evidence if the training course or other method used to gain the qualification is directly relevant and practical for application in the workplace.

4) Completion of Training Courses. A good way of providing information, but not sufficient to prove individual capability in applying the knowledge gained from the course.

5) On-the-Job Assessment. A good way of determining capability, however, its effectiveness relies heavily on the competence of the supervisor or manager conducting the assessment as it relies on their subjective judgment.

6) Human Factors Assessments. Employees are asked what they would take into account when doing particular tasks. As an example, a planner explains knowledge of maintenance human factors: he would consider the effect fatigue might have and schedule critical tasks to be completed during the day shift or at the start of the night shift rather than in the early hours of the morning. This explanation shows that the planner understands how some maintenance human factor issues are applicable to his job. The pervading culture within an organization may be contrary to good assessment principles (e.g., the culture might be that errors are not tolerated and are regarded as signs of incompetence). If this is the case, it is likely that judgments of capability will be biased towards that company culture. It is important, therefore, that employees are trained in how to assess capability, and that independent checks are carried out of the capability assessment process. Documentation of the assessment process should include:

a) Establish objective levels of capability (apprentice, journeymen, inspector, RII inspector, instructor, supervisor, etc.). Source background for identifying these levels can be based on the concepts described in the current edition of AC 65-2, Airframe and Powerplant Mechanics Certification Guide, and part 147 appendix A. Other sources of concepts may be required to determine instructor, manager, and other employee levels.

b) Establish levels of capability based on the specific job function of the employee and identify the task level to which that employee is able to perform.

c) Monitor and manage capability through documentation of the performance level of the employee:

- Method of ensuring that the employee understands the application of maintenance, preventive maintenance, or alterations, and the repair station's performance issues appropriate to that person's function in the organization;
- Recording of the capability of the employee to consistently repeat the performance of a task at an acceptable level;
- Audit of tasks performed;
- Method for identifying and correcting deficiencies; and
- Foreign repair stations regulated by EASA use the word "competency" in their EASA Part-145 regulations. The FAA uses the word "capability" in

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§ 145.163(b). When an FAA-certificated domestic or foreign repair station uses one of these words in their training program, they are to be considered synonymous in their meaning and application.

3-4467 ISSUES AFFECTING PROGRAM REQUIREMENTS. The following issues vary by repair station and may affect the construction of its training content.

A. Added Requirements. Maintenance performed for 14 CFR parts 121, 125, and 135, and for foreign air carriers or foreign persons operating a U.S.-registered aircraft in common carriage under 14 CFR part 129 adds requirements to the repair station training program, which must be documented. Repair station procedures should describe a plan for ensuring that training is conducted on the air carrier's program for the maintenance functions to be contracted prior to the facility performing maintenance, preventive maintenance, or alterations for the specific air carrier or commercial operator. Documentation and recording of the specific training is the responsibility of both the air carrier and the repair station. Documented training should show specifically that the repair station was trained in accordance with the air carrier's or commercial operator's program and applicable section of its maintenance manual.

B. Foreign Repair Stations. The significant difference between domestic and foreign repair station personnel is that foreign repair station personnel are not issued a certificate under part 65. Equivalent personnel positions must have the same level of training as specified for their domestic counterparts. This training would include those subject areas as discussed in this chapter.

C. EASA-Accepted Facilities.

1) Repair stations that hold approval under EASA may already have a training program that complies with part 145 requirements. PIs should perform a careful review of this program to ensure that the applicable regulatory requirements of part 145 or EASA Part-145, § 145.163 are met. Upon review by the PI to ensure that the training program contains all the required elements, the PI may then approve the program. The training program now becomes the repair station's FAA-approved training program. For a certificated repair station that operates within the guidelines defined in an "International Agreement," that repair station's training program is approved in accordance with the procedures of that agreement.

2) A difference between FAA and EASA requirements is that knowledge of human performance and limitations (HPL) has been in International Civil Aviation Organization (ICAO) Standards and Recommended Practices (SARP) for many years. EASA Part-145 expanded its training requirement to extend HPL to all staff, as well as certifying staff, and to include initial as well as recurrent training.

3-4468 TRAINING METHODS AND SOURCES.

A. Methods. There are many methods available to formulate a good training program as well as actually delivering training. Certain training methods are more appropriate than others for teaching specific types of skill and knowledge. Training methods can be classified into one of the following categories:

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1) Classroom Training. A training course is normally defined as one that is usually taught by a manufacturer or other aviation agency/operator, or by the repair station if instructor-training personnel are trained and subject matter experienced. A valuable asset of this type of training is the interaction between course instructors and attendees, where views and experiences are compared. The importance of a skilled and knowledgeable trainer cannot be overestimated. Much of the emphasis of training should be upon reinforcing or changing attitudes and imparting knowledge, and a good trainer/facilitator is the key. This is normally considered in classroom/formal training where the quality of the training relies heavily on the instructor's ability and the adequacy of the classroom environment.

2) OJT. OJT encompasses the basic principle of learning while accomplishing a task or work. Normally this consists of demonstrations and supervised practice with equipment and procedures in the actual work environment. It can be an effective method of imparting skills to employees and may be most effective when:

- Employees already have prerequisite knowledge and skills and do not need long explanation and discussions;
- The target skills can only be taught, or are best learned, in an actual work environment;
- The work environment cannot be reasonably simulated or replicated in the classroom or with computer-based training (CBT);
- The training task closely matches tasks found in the repair station, such as accomplishing steps in a procedure;
- The training program documents appropriate curriculum and syllabi; and
- The training program documents a method to ensure that OJT instruction personnel are qualified and experienced in giving training.

3) CBT. CBT, or Internet-based training, is a generic term that refers to any electronically-based technology that is used to create and deliver training. Most products include built-in testing, participant management, administration, and recordkeeping functions. There are wide varieties of hardware and software applications that can be used or tailored to a particular repair station's needs.

a) The primary advantages are an interactive method of training, intelligent tutoring systems, and the capacity of material to be adapted to individual employee needs with testing that conforms to a level of knowledge, skill, and pace. It permits the material presentation and testing to be standardized. It is also good for enhancing skills that require practice, such as troubleshooting and computational skills, or memorization of facts such as specifications. Use of CBT prior to attending a course/class can help ensure that an employee masters the basic prerequisite knowledge needed for the class.

b) Repair stations should assess whether or not the particular category of a training program can be completed by use of CBT alone or by adding practical skill level training and testing to ensure the appropriate capability level of the employee.

4) Distance Learning. This refers to any training in which the instructor and the employees are not in the same geographical location. There are many different forms such as:

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- Mail-based correspondence courses using written, videotaped, or even CBT materials;
- Satellite and video conferencing or "virtual" classroom;
- CBT one-way video or one-way video with two-way teleconferencing; and
- Internet/Intranet, which can provide both live instruction and interactive courseware similar in manner to CBT.

a) Normally the employee watches a video, completes the corresponding work assignment, and the materials are mailed back to the granting institution.

b) The advantage to this type of training is that material, employee testing, and assessment are more likely to be standardized and can be tailored to a repair station's needs and provide information for required records.

5) Just-In-Time/Embedded Training.

a) This permits users to learn specific job tasks just before they need to accomplish it, or during the accomplishment of the task itself. This method of training is also called "embedded" training because it can be incorporated into the equipment or software that is used to perform the job in question. This type of training may encompass interactive instruction or application and require observation by an instructor or supervisor.

b) Embedded training can also appear in software applications and operating systems as sophisticated contextual "help" programs or tutorials. The application itself becomes the instructor. In this case, there is not usually a method to ensure that the employee can perform the specified task to an appropriate level. This means that the training program must contain a method to ensure that the designated knowledge and skill level is obtained by the employee. Embedded training is most appropriate under the following conditions:

- Employees cannot be novices and must have some knowledge of the topic or task;
- The task to be learned is clearly identified in scope and is conceptually simple;
- The media and method in which training is embedded are part of the task or equipment to be learned; and
- A clear record of the employee testing and assessment must be contained in the repair station's program.

B. Sources. A repair station may adopt several training sources in the development of its training program. A combination of sources, methods, and the training needs assessment may be used by the repair station. Each source also has advantages and disadvantages depending on the repair station's training needs and size. Training sources can be classified into one of the following categories:

1) Original Equipment Manufacturer (OEM). An OEM usually provides both formal and informal types of courses depending on complexity of subject matter. However, there are usually prerequisites that the employee must meet prior to attending OEM courses, such as

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previous mechanical/electronic background and experience. OEMs that have training departments normally also have the records showing the qualifications of their instructors. Instructor qualifications must be made available to the repair station prior to using the OEM services for training.

NOTE: Most OEM training is either a specific system, or an article or product of a system, and may not cover the interactivity of system or article to a product.

2) AMTS. AMTSs approved under part 147 can be a great source of training for repair stations. They have certified and qualified instructors; approved curriculum, syllabus, and course material; and the necessary equipment to provide hands-on skills training. While this is an excellent source of training, repair stations may need to supplement this training with their own indoctrination, initial, and recurrent training along with article and/or product training to a specific level. The repair station's training program should describe the use of this type of source and have a method (assessment) to determine what is most suitable for it and its personnel when it plans to use an AMTS.

NOTE: In some cases, repair stations may choose to use AMTSs, other repair stations, air carriers, or other entities to provide all or some of their training under contract. If this is the case, the repair station is still responsible for the administrative requirements, such as administration and currency of the training program, qualifications of instructors, ensuring the capability of personnel, maintaining training records, and coordinating approval and changes to its program with the CHDO, etc.

3) Other Repair Stations. Large part 145 repair stations, especially those that are EASA-accepted or that perform work for an air carrier or operator, may be an excellent source to provide training to smaller repair stations. Smaller repair stations may contract with these facilities for technical training as it pertains to its ratings and OpSpecs or maintenance human factors training. The utilization of this type of training may provide a cost savings to a smaller entity.

4) Federal or State Agencies. In many cases, Federal or State agencies provide training courses on aviation industry and related industry requirements: regulations, OSHA/EPA, shop safety, maintenance human factors, etc. When repair stations make this type of training part of their program, they should ensure that the training meets the needs and requirements of the repair station's capabilities.

5) Trade Associations. Many trade associations provide a variety of training sources, including seminars, product demonstrations, videos, computer-based instructions, equipment manufacturers, etc.

6) Other Sources. There are a variety of other training sources, which include, but are not limited to, independent seminars, product demonstrations, computer-based instructions, videos, and equipment manufacturers. All sources of information should be viewed as potential training sources. The repair station's training program should have a method of incorporating training opportunities to ensure that each employee is capable of performing assigned tasks.

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7) Combination of Sources. A combination or all of these methods and sources may be appropriate to any given repair station.

C. Coordination Requirements. These tasks require coordination among the ASIs (maintenance and avionics). Regional coordination may be required.

3-4469 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Title 14 CFR Parts 39, 43, 45, 65, 91, 121, 125, 129, 135, 145, and §§ 145.163 and 145.209(e).
- Title 49 CFR Parts 170 through 175.
- AC 145-10, Repair Station Training Program.
- AC 145-9, Guide for Developing and Evaluating Repair Station and Quality Control Manuals.

B. Forms:

- FAA Form 8060-4, Temporary Airman Certificate.
- FAA Form 8610-2, Airman Certificate and/or Rating Application (if applicable).

C. Job Aids. Job Task Analyses (JTA): To be determined (TBD).

3-4470 ELECTRONIC MEDIA.

A. Use of Electronic Media. Air agencies that elect to use electronic media (CD-ROM, Local Area Network (LAN)-based, or Internet-based systems) must be allowed to use those systems without interference or extra procedures. It is incumbent upon the air agency to ensure that its CHDO is equipped for the media it selects to ensure that delays or other hindrances do not occur. To ensure a consistent approach to document and manual submissions and revisions, the requirement for signing the title page or revision page will be replaced by transmittal documents.

B. Use of Electronic Transmissions. Use of electronic transmissions (e.g., email or fax responses) are an acceptable alternative to the cover letter if the repair station is equipped to transmit and receive any necessary attachments. This may include the use of electronic signatures. This method should be addressed in the repair station's procedures and be found acceptable to the FAA.

3-4471 EVALUATION AND APPROVAL OF A TRAINING PROGRAM AND REVISIONS.

A. AC 145-10.

1) AC 145-10 was developed for industry and provides information on the development of a repair station employee training program mandated under § 145.163. The AC provides an acceptable means, but not the only means, of showing compliance with

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§ 145.163. Sample training programs described in appendices 1 and 2 of the AC represent structures that may be used by a repair station to develop its training program. Each person subject to part 145 should develop his or her own program tailored to individual operations. Because the AC contains only guidance on developing a training program, the word "should" used within the AC applies only to an entity that chooses to follow a particular suggestion without deviation.

2) AC 145-10 contains additional governmental, mandatory, and nonmandatory subjects not specifically required by § 145.163. The FAA is aware that the additional training outlined in the AC exceeds that required by § 145.163, but feels it necessary to provide these subject samples as a guide for a complete and comprehensive safety-directed program. If the repair station chooses to develop a training program with the additional nonregulatory subjects, only those required by regulation would be subject to FAA approval. One means of developing this type of program by a repair station could include a separation of the regulatory and nonregulatory training subjects within their training manual.

3) Training in maintenance human factors is an essential part of an FAA-approved training program. The repair station's submitted training program and any revision thereto must include human factors elements. The FAA will not prescribe what human factors elements to include, but those elements should focus on aviation maintenance and safety-related issues. If human factors were not included, their exclusion would hinder the training program approval. (Refer to AC 145-10 for additional information.)

B. Overview of the Process. Training program approval is predicated upon the repair station's ability to conform to the requirements of part 145, which is based on a repair station's specific capabilities. Depending on the complexity of the repair station's request and the availability of FAA resources, the approval process may be accomplished in only a few days, or the process may last a few months. Once the FAA approves the repair station training program, the repair station will begin to follow their approved procedure. The approval process applies to each repair station requesting approval of a new program or a revision to a currently approved program. Training programs submitted to the FAA for approval and found to be in conflict with regulatory requirements or to be inadequate must be appropriately modified by the repair station in accordance with the established repair station manual procedures. When appropriate, job aids have been developed to assist inspectors in the approval process. These job aids are discussed in paragraph 3-4473.

C. Procedures for Obtaining Training Program Approval.

1) The procedures for obtaining the training program approval normally begin with a meeting between the responsible training personnel of the repair station and the PI to discuss the scope of the training, the timing of the program document submittal, and other plans. This meeting will be an opportunity for the repair station to ask questions about the FAA process. Although this meeting is not required, it will provide an opportunity for both sides to understand the expectations of the other on a subject that is new to both. For a new repair station, this initial meeting is also an opportunity for the FAA to verify the intent of a new repair station with respect to:

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- Ratings and other authorizations that will be sought;
- Maintenance function that will be contracted;
- Customers that include parts 121, 125, and 135 and/or certain part 129 operators;
- Personnel's current and required capabilities;
- Tools, equipment, and facilities;
- Overview of procedures and paperwork; and
- Proposed training and training sources.

2) The formal submittal of the training program should be made on or before the dates as defined in part 145.

3) The repair station may submit its program document as electronic media; however, it is the repair station's responsibility to ensure that the CHDO is equipped to review and store the submitted material in the media the repair station selects. Material submitted electronically must be accompanied by a transmittal document. The FAA approval will be similarly indicated by a transmittal document. These transmittal documents may be in the form of an email, fax, or letter and may include the use of electronic signatures. As required by § 145.209(e), the repair station's manual must contain a description of the procedure it will use to submit changes to the training program. Similar procedures should be used to submit the program for initial approval. The repair station's accountable manager or someone acting on his or her behalf must sign the submittal.

4) The content of the initial training program submittal may be reviewed using the criteria and standards described in AC 145-10.

5) The FAA will review the proposed training program or revision and either approve it or prepare an explanation of why the program or revision cannot be approved as submitted. A letter or electronic transmittal of the FAA approval or rejection will be sent to the individual who has signed the submittal for the repair station.

6) If the FAA is not able to approve a submittal, the repair station should propose revisions that address the FAA's concerns. When the repair station has adequately addressed all the concerns expressed in the FAA rejection, the program will be approved.

7) A change to the approved training program can be initiated by the repair station or by input from the PI. Any revision to the program document should be provided to the inspector for approval. The training program will be changing constantly, as it should, to accommodate changes to the repair station's work and/or customers, and in response to the ongoing assessment processes of the repair station and of the FAA. Correction of typographical errors and changes to phone numbers would be examples of changes not needing FAA approval. However, the repair station should send a corrected copy to the FAA.

8) The FAA does not determine instructor qualifications. However, if the FAA—through its surveillance process—finds that the qualifications or skills of an instructor are deficient, the repair station must correct any deficiency associated with that instructor and with its instructor selection and quality monitoring process.

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9) The training program must have a process measurement element that verifies the effectiveness of the training. This provides a continuous improvement characteristic to the training program. Therefore, one of the key areas the FAA will monitor is the feedback process that takes evaluation results and adjusts training needs. The FAA might also independently assess training to evaluate the effectiveness, particularly where safety risk is relatively high.

10) Training standards are not set by the FAA but the PI should verify that the repair station has an adequate training program to meet regulatory requirements. If, in the course of normal surveillance or in the investigation of an unplanned and undesirable event, an FAA inspector discovers inadequate training, he or she will notify the repair station that a training deficiency has been identified and that a change must be made. The FAA will give the repair station a reasonable time to make the change as long as steps are taken by the repair station to ensure that no unairworthy product results from the training deficiency. When the repair station develops a modification to the training program to correct the deficiency, the FAA will review it and either approve the revised program or indicate that additional changes are still required.

11) If the program or program revision is submitted in an electronic format, the FAA inspector will indicate approval or denial with an email message or letter. If approval of the submittal is denied, the FAA email message or letter will include an explanation of the denial.

12) The training program revision process may be initiated by either the repair station or the FAA as follows:

a) Repair station-initiated: The operator informs the FAA that it is planning to establish a new training program element/component or to change an existing program.

b) FAA-initiated: The FAA informs an operator that revisions to its training program are required based on recently acquired information relative to training techniques, aviation technology, aircraft maintenance history, or regulatory changes.

13) The training program approval/rejection process may be initiated by the FAA, as follows:

a) When review of the training program or revision has shown compliance with the regulation and the form and manner prescribed in this chapter, issue a letter of approval. (See Figure 3-155, Example Letter of Approval.)

b) When review for approval of the training program or revision is rejected, issue a letter of rejection, with an explanation of discrepancies; the letter of approval format may be used. (See Figure 3-156, Example Rejection Explanation Statement.)

14) A repair station training program must meet the requirements of § 145.163. A repair station's training sources, training methods, curriculum, training courses, etc., are not subject to FAA approval. The PI only determines that the elements of a repair station training program are met, which ensures that the repair station trains to meet its capabilities and customer-specific requirements. The training program content will be evaluated for compliance of the rule. The repair station shoulders the responsibility that its training program sources, methods, curriculum, and courses meet the requirements of the rule and its customers.

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D. Evaluating the Training Program. The elements for training evaluation listed in Table 3-123, Elements for Training Evaluation, may also be used as an inspector tool in determining that a repair station's training program contains the elements necessary to sustain the repair station's capabilities.

1) At a repair station to which more than one discipline of inspector is assigned, inspectors should work together during the review and approval of the training program. Even a repair station assigned only one PI may benefit from a peer review using their expertise to ensure that programs are in accordance with the regulations.

2) The evaluation begins when the repair station starts training under the approved training program. The PI should monitor training conducted under program approval. Whenever possible, the first session of training conducted should be monitored by the PI or a qualified inspector. An FAA inspector does not need to observe every training session. A sufficient sampling of the training sessions, however, should be observed as a basis for a realistic evaluation.

3) During the evaluation, the repair station must demonstrate the ability to effectively train their personnel. Any deficiency identified during the evaluation of the training program must be discussed with the repair station. The repair station will make the necessary changes to correct the deficiency to its training program.

E. Elements Available for Evaluating Training. The PI must develop a plan for systematically evaluating training given under the approved training program. There are five elements that can be evaluated when assessing the overall effectiveness of training programs. These five elements are: course outlines, courseware, training methods and training environment, testing and checking, and surveillance and investigation of repair station activities. These elements are interrelated; however, each can be separately evaluated.

1) Before evaluating a training program, an inspector must become familiar with the contents of the training courses to be evaluated. This preparation is essential if an inspector is to determine if a repair station has developed an effective course of instruction.

2) Direct examination of courseware includes reviewing materials such as lesson plans, workbooks, etc. Courseware is usually the training program element that is most adaptable to revision or refinement. Inspectors must review at least a sampling of the courseware.

3) Direct observation of instructional delivery includes surveillance of training methods, such as instructor lectures, CBT presentations, and OJT instruction. Effective learning can only occur when an instructor is organized, prepared, and properly uses the courseware and various training aids. The inspector must determine if the instructional delivery is consistent with the courseware. For example, the inspector should note if the instructor teaches the topics specified in the lesson plan. Training aids and devices should function as intended during the instructional delivery. In addition, during training, the inspector should be sensitive to the type of questions being asked by employees and should identify the reasons for any excessive repetition. These conditions may indicate ineffective training method or courseware. The inspector must also determine if the instructional environment is conducive to learning. Distractions that

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adversely affect delivery, such as excessive temperatures, extraneous noises, poor lighting, and cramped classrooms or workspaces, are deficiencies because they interfere with learning.

4) Direct observation of testing and checking is an effective method for determining whether learning has occurred. Examining the results of tests, such as oral or written tests, or OJT, provides a quantifiable method for measuring training effectiveness. The PI must examine and determine the causal factors of significant failure trends.

5) Direct observation of training and checking in progress is an effective method of evaluating training. Sometimes the opportunity for direct observation, however, will be limited. In such cases, the PI will have to rely more on his evaluation of other sources of information such as reports of surveillance and investigations. Results of inspection reports, incident or accident reports, compliance actions, enforcement actions, and other relevant information about the repair stations should be evaluated by the PI for training effectiveness. For example, repeated reports of deficiencies, such as the inability to grasp troubleshooting techniques or incorrect use of technical data or RSM procedures, may be traceable to a lack of specific training or ineffective training. Such information may provide indications that revisions or refinements are necessary for a training course and/or training course modules.

Figure 3-155. Example Letter of Approval

ABC Repair Station
Accountable Manager
417 Oakton Boulevard
Enid, OK 78154

Dear Mr. Townsend:

Training program/revision approval is granted to ABC Repair Station's training program, dated May 21, 2006. The effective date of approval is May 21, 2006. ABC Repair Station may continue to train in accordance with this program until ABC Repair Station revises its program in accordance with § 145.163(d) and obtains FAA approval in accordance with § 145.209(e).

Figure 3-156. Example Rejection Explanation Statement

This letter is in response to your request for approval of Revision 2 to ABC Repair Station's training program/revision, dated March 2, 2006. Your request for approval of Revision 2 is rejected for the following reason: Revision 2 deletes training previously given on Cessna 182 aircraft and does not provide any identifiable instruction to your mechanics, repairmen, or technicians. Presently there is not another course of training for ABC Repair Station containing adequate information on Cessna 182 aircraft maintenance.

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Table 3-123. Elements for Training Evaluation

Course Outlines	Course outlines contain the specific training course modules and the amount of time allocated for the course. The course modules must be consistent with the regulatory requirements and safe maintenance practices. This element requires direct examination.
Courseware	Courseware converts the syllabus outline information into usable instructional material. Courseware must be consistent with the syllabus outline and be organized to permit an effective training method. It is readily adaptable to adjustments and refinement by the repair station. This element usually requires direct examination.
Training Methods and Training Environment	Training methods are used to convey information to the employee. Effective learning is maximized if the training method adheres to and properly uses the courseware. The training environment should be conducive to effective learning. This element requires direct observation.
Testing and Checking	Testing and checking is a method for determining whether learning has occurred. Testing and checking standards are used to determine that a desired level of knowledge and skill has been acquired. Testing and checking also measures the effectiveness of courseware and training method. This element requires direct observation. It can be supplemented by examining the repair station's records of test and checks.
Surveillance and Investigation of Repair Station Activities	Surveillance and investigations produce information about a repair station's overall performance. A high rate of satisfactory performance usually indicates a strong, effective training program. Repeated unsatisfactory performances can often be traced to deficiencies in a training program. This element requires the examination and analysis of surveillance and investigative reports.

3-4472 INSPECTOR EVALUATION GUIDE FOR THE DEVELOPMENT AND IMPLEMENTATION OF A PART 145 REPAIR STATION'S TRAINING PROGRAM. The training program development process includes:

A. Needs Assessment/Analysis. The purpose of this phase is to determine the goals and objectives of the training.

B. Design Phase. This phase serves to refine training goals and objectives and instructional and evaluation strategies.

C. Course of Study. The course categories can be organized into a course outline, specific course, or course modules.

D. Prototype. This phase includes the delivery of training materials, the training of instructors, and a dry run of the sections in the program to verify proper flow of the material.

E. Validation. At this stage, the training can be delivered in a typical training environment. Meetings should be held to discuss and evaluate the prototype to fine-tune the program.

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F. Adoption. The training program is scheduled and formally announced.

G. Implementation. The training is provided at this stage.

H. Employee Evaluation. It is important to evaluate the employee's comprehension of all course material.

I. Program Measurement. Program developers should identify valid and reliable processes to measure training program effectiveness.

J. Feedback. This phase allows the product to influence the training program in a constant cycle of evaluation and improvement, such as through class and/or instructor evaluations.

3-4473 ADDITIONAL TRAINING PROGRAM STRUCTURE GUIDES.

A. Training Course Outline (TCO). The repair station as appropriate can determine its training requirements. Each course/course module should include the following information:

1) Course Prerequisites. What employees must have completed before they are eligible for the course.

2) Training Subject. What knowledge is to be imparted by the course and the course content.

3) Course Duration. May be specified in hours.

4) Training Methods. The method for the training course should be specified. There are varieties of methods to choose from based on what is most appropriate for the course in question. They range from OJT to formal classroom courses.

5) Completion Standards. There should be a description of what has to be accomplished for the employee to complete the course/syllabus. Examples of this could be a knowledge or practical test with a passing grade, a submitted project or demonstration of skill, or a certificate of completion.

B. Qualifications and Authorizations. The repair station should describe the training requirements for various qualification levels of its employees depending on their job function as well as individual authorizations. For example:

- RII (if applicable),
- Inspector levels,
- Technician skill levels, and
- Specialized services.

C. Instructor Selection. The repair station's training program should include criteria for instructors and a description of how instructors are selected. In cases where the sources of training are external to the repair station, it may not be possible to select instructors, but the

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quality of instruction should be monitored to ensure the quality of training employees receive is adequate.

D. Planning and Scheduling. Most training should be scheduled in advance to ensure adequate preparation time and to maintain a continuity of training for all employees. Management should plan training based on current requirements, but the plan should be adaptable to changing needs, such as those of a new customer or with the acquisition of new equipment. Occasionally, remedial training will be required for employees stemming from the results of an audit or unacceptable skill demonstration. This type of training cannot be scheduled in advance and may have to be accomplished relatively quickly. Therefore, the training schedule should be sufficiently flexible to accommodate such circumstances.

E. Training Records. The repair station's training program should specify where employee training records are maintained and for how long (at least 2 years). Many repair stations will elect to keep employee training record summaries in a computer system. If records are maintained electronically, the repair station should also maintain a physical file to keep important documents such as FAA certificates, diplomas, and proofs of course completions. The training program should also specify the procedures by which records are maintained as well as what QC will be conducted over those records. At a minimum the training record should include:

- Employee's name and signature,
- Dates and duration of training,
- Type of training,
- Location of training,
- Name and signature of instructor, and
- Test results (if applicable).

F. Training Facility. A description of the repair station training facility/facilities may be included in the repair station's training program. If the facility has a dedicated classroom, it should be adequately lighted, ventilated, and equipped. Alternatively, an offsite facility could be used, or the facility may be the repair station's work area.

G. QC.

1) Each repair station should discuss in their training program how they intend to monitor the quality of the training they provide to their employees. There should be a formalized effort to review the effectiveness of the training program, although this may be through an external means (such as an audit accomplished by a department other than that training). At the very least, employees should be asked to fill out course evaluation forms. These should be compiled and analyzed to identify either best practices or deficiencies in instructors or training materials.

2) Supervisors may also elect to attend certain classes to enhance the QC process, although this may not be easy for classes provided by external organizations. Audits of external training providers may be scheduled as an alternative. If this is not possible or desirable, some interviewing of returning course attendees can be accomplished to obtain more detailed information than would be possible through a written questionnaire.

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H. Definitions and Abbreviations. The repair station training program should define all terms and acronyms for the sake of clarity and to avoid confusion in cases where acronyms are company specific and may have different meanings among different facilities.

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Figure 3-157. Training Program Content Analysis

Repair Station Certificate Number:				
Date Completed:				
A.	**Evaluate Training Program.**	**YES**	**NO**	**N/A**
1.	Has a systematic analysis been completed to identify the tasks performed by the trainee?			
2.	Does the task list appear complete, based on current roles and responsibilities, facility mission, and ongoing activities?			
3.	Have the required knowledge, skills, and abilities to perform the identified tasks been defined?			
4.	Are the task list and required knowledge, skills, and abilities reviewed and updated periodically to reflect changes in procedures, facility systems/equipment, job scope, and advances in technology?			
5.	Have knowledge, skills, and abilities to be enhanced through training been selected?			
6.	Have training settings including classroom, laboratory, or "on-the-job" training (OJT) been selected appropriately for the selected knowledge, skills, and abilities?			
7.	Has a logical sequence for training that builds upon a growing base of knowledge, skills, and abilities been defined?			
8.	Have entry-level requirements been specified for employees?			
9.	Do entry-level requirements include physical abilities, educational, technical, and experience requirements?			
B.	**Interview Employees.**			
10.	Does the training program improve the ability of the employee to perform his or her job?			
11.	Are there elements of employee job or specific tasks where they are not trained, but feel that training is needed?			
12.	Are training settings appropriate for the material covered? (Classroom training covers required knowledge, application training addresses skills, and OJT strengthens abilities to perform tasks.)			
13.	Has training been sequenced properly?			
C.	**Interview Supervisors.**			
14.	Are personnel able to perform their jobs more effectively following training?			
15.	Are there essential tasks or elements of employees' jobs that are not addressed in current training?			
16.	Does a mechanism exist to inform the training organization of changes in job responsibilities, in work practices, and in equipment so that job/task analyses are updated?			
COMMENTS:				

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Figure 3-158. ASI Checklist to Facilitate Training Program Approval

This checklist is to be used as a minimum standard to assist the aviation safety inspector (ASI) in establishing a basis for approval of the training program required by 14 CFR part 145, § 145.163. The elements identified on the checklist are derived from regulatory requirements and accepted industry practices. The checklist may be altered or modified to fit a wide range of applications in order to attain an acceptable comfort level for the approving inspector. It is recommended that this form or a similar form used by the approving official be retained by the certificate-holding district office (CHDO).

	Repair Station Certificate Number:	**YES**	**NO**
1.	Is the manual identified with company name, address, certificate number, and other contact information appropriate to this manual (phone, fax, e-mail, etc.)?		
2.	Does the manual have a control system?		
3.	Does the control system include a distribution list identifying a particular manual to a person or location?		
4.	Does the manual contain an adequate revision system to allow an easy determination of currency and person responsible for inserting the revision?		
5.	Is there a procedure for submitting revisions to the CHDO for approval and retaining records for a 2-year minimum?		
6.	Does the training program have provisions for initial and recurrent training?		
7.	Does the training program adequately identify task functions for the performance of maintenance or inspection functions?		
8.	Does the training program adequately ensure that each employee performing a maintenance or inspection function is capable of performing the assigned task?		
9.	Are individual training requirements identified and documented in an acceptable manner?		
10.	Is there a method of measure or test to ensure the training is effective?		
11.	Has the advisory circular and handbook guidance been reviewed to ensure that issues particular to this training program have been addressed?		
12.	Does the training manual qualify for FAA approval?		
COMMENTS:			
Signature:		**Date:**	

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3-4474 TASK OUTCOMES.

A. Complete the PTRS Record.

B. Complete the Task. Completion of this task will result in one of the following actions:

1) Approval/denial of the training program/revision by doing the following:

a) Place "Approved" with the date, office identification, and signature of the inspector on the List of Effective Pages (LEP).

b) File office copy of training program/revision as follows:

- If it is an original training program, file a copy of the entire training program in the certificate holder/applicant's office file; and
- If it is a revision, remove the affected pages, insert the revised pages in the current training program, and update the manual control system.

c) Return the training program/revision to the applicant with a letter.

2) Reject the training program/revision by doing the following:

- Return all copies to the applicant with letter explaining discrepancies; and
- Explain to the applicant that the manual must be corrected and resubmitted in order to proceed with the certification or revision process, file all supporting paperwork in the certificate holder/applicant's office file, and update the enhanced Vital Information Database (eVID).

3-4475 FUTURE ACTIVITIES. Perform followup and surveillance inspections as required. This section is not all inclusive; repair station size and capabilities may determine which elements are applicable.

RESERVED. Paragraphs 3-4476 through 3-4490.

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VOLUME 3 GENERAL TECHNICAL ADMINISTRATION

CHAPTER 60 PROCEDURES FOR AVIATION SAFETY INSPECTOR DECISIONMAKING

Section 1 Aviation Safety Inspector Decisionmaking Regarding Airworthiness Directive Compliance

3-4863 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES AND AIR TRANSPORTATION OVERSIGHT SYSTEM (ATOS) BUSINESS PROCESS AND TOOLS.

A. Maintenance: 3649.

B. Avionics: 5649.

C. ATOS Business Process and Tools. Risk management process (RMP), Corrective Action Tracking Tool (CATT), and Dynamic Observation Report (DOR).

NOTE: The aviation safety inspector (ASI) will use the appropriate Organizational Technical Administration, Aircraft and Equipment, or ATOS business process and tools.

3-4864 OBJECTIVE. This section provides guidance to ASIs to determine if a product complies with an Airworthiness Directive (AD). It also provides guidance for ASIs when they are unable to clearly determine the compliance status of the product.

3-4865 GENERAL. The Federal Aviation Administration's (FAA) policies and procedures require all ASIs to determine what resources are needed to solve difficult and controversial issues, which will eliminate single-person and subjective determinations. ASIs are directed to seek guidance from internal FAA resources, including the certificate-holding district office (CHDO), principal inspectors (PI), Aircraft Evaluation Group (AEG), Aircraft Certification Office (ACO), Regional Office (RO), and/or appropriate FAA headquarters (HQ)-level branch. ASIs should rely on these resources to gather the appropriate information on which to determine AD compliance and applicability.

3-4866 INTRODUCTION. The FAA is responsible for announcing and enforcing adequate standards and regulations. Title 49 of the United States Code (49 U.S.C.), § 44702(b)(1)(A) specifies, in part, that when prescribing standards and regulations and when issuing certificates, the FAA will give full consideration to "the duty of an air carrier to provide service with the highest possible degree of safety in the public interest." Thus, § 44702(b)(1)(A) should be clearly understood to mean that this responsibility rests directly with the air carrier, irrespective of any action taken, or not taken, by an FAA inspector or the FAA.

3-4867 DEFINITIONS.

A. Airworthiness. Title 49 U.S.C., § 44704(d) best defines airworthiness by imposing a two-pronged definition. In order to be Airworthy, an aircraft must:

- Conform to its type design certificate, and
- Be in condition for safe operation.

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B. Airworthiness Directives (AD). ADs are substantive regulations that the FAA issues in accordance with Title 14 of the Code of Federal Regulations (14 CFR) part 39, § 39.5. ADs are issued when:

1) An unsafe condition has been found to exist in particular aircraft, aircraft engines, propellers, or appliances installed on an aircraft; and

2) The condition is likely to exist or develop in other aircraft, aircraft engines, propellers, or appliances of the same type design. Once an AD is issued, a product may be operated only after it meets the requirements of that AD.

NOTE: Sensitive Security Information (SSI) AD guidance is located in Volume 6, Chapter 2, Section 36.

C. Alternative Method of Compliance (AMOC).

1) An AMOC is an FAA-approved method of compliance, other than the one specified in an AD, that resolves an unsafe condition on a product and provides an Acceptable Level of Safety (ALoS). An AMOC may also change the time required to accomplish an AD.

2) In August 2002, the FAA made Amendment No. 39-9474 to part 39. The amendment incorporates several standard provisions previously included in individual ADs. One standard provision specifies that an AD applies to a product even if the product is modified, altered, or repaired in the area addressed by the AD. In such cases, an AMOC may be required. Another standard provision identifies procedures for asking the FAA to approve AMOCs to an AD.

D. Product. Per § 39.3, the term “product” means an aircraft, aircraft engine, propeller, or appliance.

E. Method of Compliance Letters. Method of compliance letters involve an approval when an AD contains statements similar to the following example: “If cracked skin is found, before further flight, repair the cracked skin and replace the loose or missing fasteners with new fasteners, as applicable, in accordance with a method approved by the Manager, Seattle ACO, FAA.” The Transport Airplane Directorate uses a method of compliance letter to approve these requests. Method of compliance letters are not covered in the current edition of FAA Order 8110.103, Alternative Methods of Compliance (AMOC); however, the Transport Airplane Directorate uses the AMOC letter requirements of Order 8110.103 as a baseline for preparing method of compliance letters.

F. Change in Compliance Time. Section 39.19 distinguishes an AMOC from a change in compliance time when it states, “Anyone may propose to FAA an alternative method of compliance or a change in the compliance time, if the proposal provides an acceptable level of safety.” However, a change in compliance time must be requested and approved using the AMOC process.

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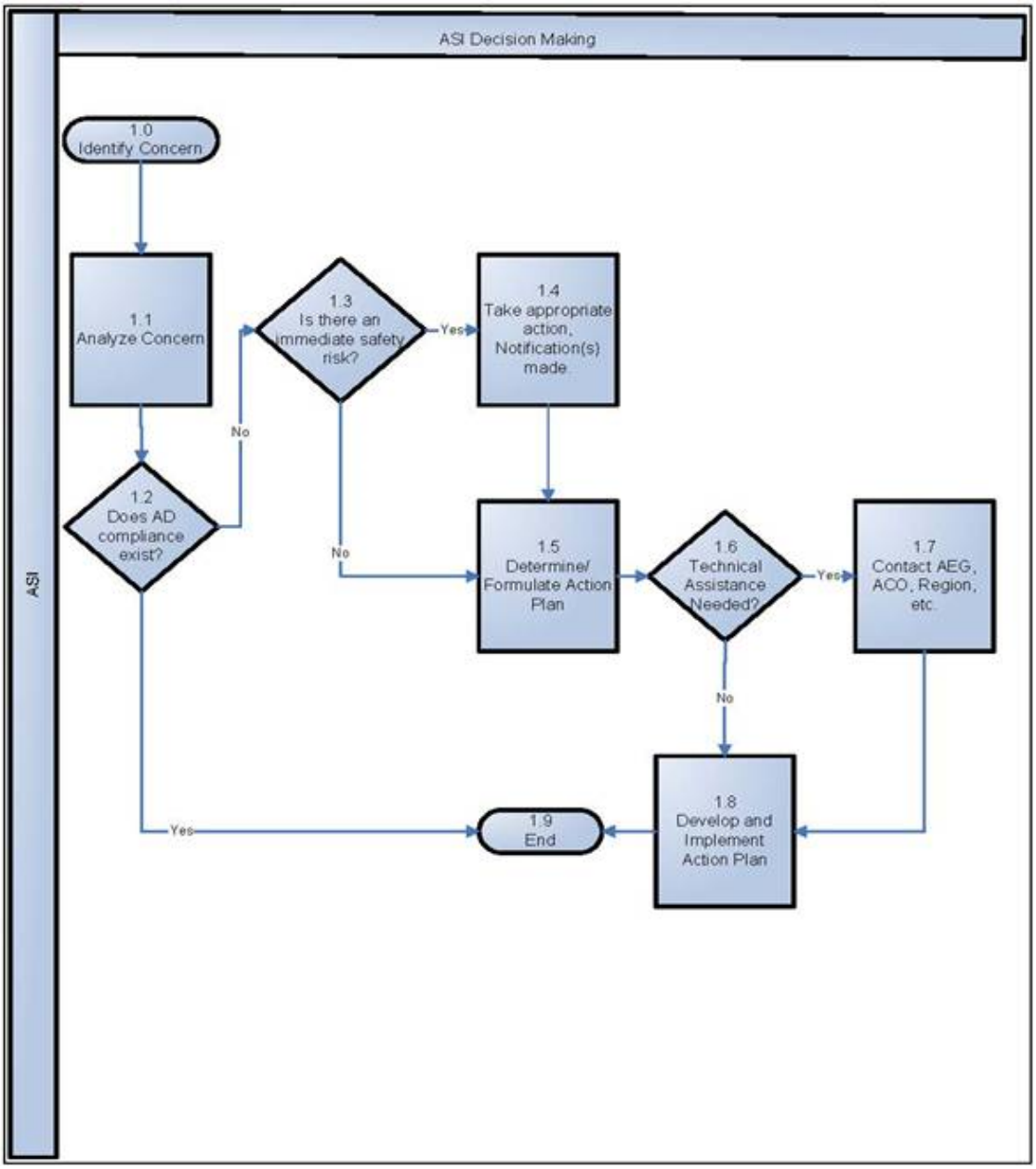
3-4868 ASI DECISIONMAKING PROCESS. See Figure 3-174, ASI Decisionmaking Regarding Airworthiness Directive Compliance, for the following steps.

Figure 3-174. ASI Decisionmaking Regarding Airworthiness Directive Compliance



A. Identify Concern (Step 1.0).

1) When ASIs suspect noncompliance with an AD, they must determine whether actual noncompliance exists. The ASI should obtain and review all documents that pertain to the area of the suspected noncompliance. Service documents may contain information to determine

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the nature and extent of an unsafe condition and what actions are required to correct the condition. ASIs should consider the following data sources:

- Copy of the complete AD, Service Information/Service Bulletin (SB), and any referenced documents. SBs may contain general notes that ASIs should review.
- Copy of any Engineering Orders (EO) or other operator or certificate holder documents that describe how the AD (or referenced document) should be accomplished.
- Minimum equipment lists (MEL)/Master Minimum Equipment Lists (MMEL).
- Copies of any AMOCs (including global AMOCs) that may have been issued for the AD.
- Copies of any maintenance records that apply.

2) If the ASIs need technical clarification or assistance to determine whether suspected AD noncompliance exists, the ASIs should first contact the AEG. The AEG will act as a liaison with the ACO, and will assist the ASI to determine and understand the technical requirements of the AD.

3) After reviewing all pertinent documents and facts, the ASI must define the concern so that the matter may be appropriately analyzed under Step 1.1.

B. Analyze Concern (Step 1.1).

1) After gathering and confirming the facts in Step 1.0, ASIs must use their experience, ability, knowledge, skills, and professional judgment to analyze and assess the identified concern. By doing so, ASIs may determine the severity and impact on safety.

2) ASIs should visually inspect the aircraft, aircraft engine, propeller, or appliance to which the suspected noncompliance applies in order to determine the exact extent or nature of the noncompliance. For example, determine if an AD was accomplished. If so, then determine if the accomplished work was unintentionally altered or partially altered.

3) When technical issues arise, ASIs should seek assistance by first contacting the appropriate AEG (Transport, Rotorcraft, Small Aircraft, Engine, and Propeller) for assistance. The field office may also coordinate with its respective region for assistance if a particular problem arises with an operator. ASIs should consider that the problem may be more widespread and could be a fleet problem that needs to be addressed at a broader level and be coordinated with the AEGs.

C. Does AD Compliance Exist? (Step 1.2). After analyzing the data from Step 1.1, the ASI should determine if noncompliance exists. If AD compliance exists, proceed to Step 1.9. However, if AD compliance does not exist, proceed to Step 1.3 to determine if there is an immediate safety risk.

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NOTE: ASIs should consult with the operator throughout the decisionmaking process. ASIs who are not on the operator's oversight certificate should also consult with the oversight ASI. When first noting the unsafe condition, the ASI should immediately contact the air carrier's station manager or any other person in the air carrier's chain of command; the responsibility for the airworthiness of the aircraft rests with the air carrier (refer to 14 CFR part 121, § 121.363), and they must correct any unsafe condition before the aircraft returns to service.

NOTE: Section 121.363 states, "(a) Each certificate holder is primarily responsible for—(1) The airworthiness of its aircraft, including airframes, aircraft engines, propellers, appliances, and parts thereof; and (2) The performance of the maintenance, preventive maintenance, and alteration of its aircraft, including airframes, aircraft engines, propellers, appliances, emergency equipment, and parts thereof, in accordance with its manual and the regulations of this chapter. (b) A certificate holder may make arrangements with another person for the performance of any maintenance, preventive maintenance, or alterations. However, this does not relieve the certificate holder of the responsibility specified in paragraph (a) of this section."

D. Is There an Immediate Safety Risk? (Step 1.3).

1) ASIs should consider the following questions to base their recommendations or decisions of an immediate safety risk. This list, which is not all-inclusive, will be determined on how an individual operator functions:

- Is this a single aircraft or fleet of aircraft?
- Is the concern an imminent safety hazard?
- Is the aircraft prepared and available for flight?
- Is the aircraft undergoing major overhaul?

NOTE: Analyzing the concern in Step 1.1 will assist the ASI in answering these questions.

2) ASIs may advise the CHDO PI to use the RMP, which provides procedures to manage hazards and their associated risks. The RMP provides a means to document and track hazards, and to oversee and evaluate the disposition of associated risks to continue adjusting the risk assessment. (See Volume 10, Chapter 3, Section 1 or Volume 6, Chapter 9, Section 2.)

3) If the objective evidence shows an immediate safety risk, proceed to Step 1.4, Take Appropriate Action.

4) If the objective evidence does not show an immediate safety risk, proceed to Step 1.5, Determine/Formulate Action Plan.

NOTE: An example of determining a safety risk would be that an AD and associated manufacturer's SB called for a clamp to be installed at a specific angle

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or position in the aircraft wheel well. After several aircraft cycles the clamp then rotated to a position that was not in accordance with the AD and SB. This condition would most likely not create a safety hazard if the clamped item did not cause chafing or interfere with other lines, ducts, or clamps in the area.

E. Take Appropriate Action (Step 1.4).

1) Notification. After identifying the noncompliance as an immediate safety risk, ASIs notify the CHDO, PI, and their Front Line Manager (FLM). The responsible CHDO PI will take the steps for notification within airline management, region, AEG, ACO, and office manager.

2) Inspector Action. If the affected aircraft is allowed to continue in service, the ASI takes the appropriate steps to mitigate the safety risk. This step can be as simple as notifying responsible operator personnel (e.g., captain, station manager, and lead mechanic) of the concern and observing operator/air carrier action. The ASI may also exercise FAA authority contained in Volume 8, Chapter 5, Sections 5 and 12.

F. Determine/Formulate Action Plan (Step 1.5).

1) The CHDO PI, in collaboration with the finding ASI, will start gathering data and start formulating an action plan that would help operators bring their aircraft into compliance. The CHDO PI may elect to continue the action plan within the CHDO. In this case, the finding ASI will gather all relevant data, documents, and pictures, and provide them to the CHDO PI.

2) The CHDO PI will formulate a strategy for correction and/or mitigation. Consideration should be given to the data sources identified in Step 1.0.

3) ASIs should review all documents to determine the nature and extent of the unsafe condition and the nature and extent of the actions required to fix it. If the identified noncompliance does not affect safety, discuss with the AEG and ACO if an AMOC is appropriate.

4) CHDO PIs should contact the applicable AEG for technical assistance. The AEG acts as a subject matter expert (SME) for delegated type aircraft and will work with the applicable ACO to resolve compliance issues. If further technical clarification is needed with the content of an AD and its SBs, the AEG will act as a liaison with the appropriate ACO.

5) As information becomes available, the CHDO PI may use the RMP (see Volume 10, Chapter 3) to continue adjusting the risk assessment.

6) To understand the scope of noncompliance, ASIs should also use this step to:

a) Identify and analyze any hazards in the operator's operating environment or systems to decide if noncompliance is an isolated incident, systemic problem, regulatory noncompliance, or airworthiness issue. Noncompliance could apply to ADs, engineering authorizations, etc.

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b) Determine if the noncompliance may be more widespread (e.g., a fleet problem) that needs to be addressed at a broader level and be coordinated with the AEGs.

c) Determine if other aircraft have been transferred or sold to another operator for possible notification concerning the AD noncompliance.

G. Technical Assistance Needed? (Step 1.6). The CHDO PI from the previous step determines what technical assistance is needed. For all aircraft engine and propeller engineering assistance, including any question over technical compliance, the AEG will be the first organization contacted to liaise with the ACO and/or the manufacturer.

H. Contact AEG, ACO, Region, etc. (Step 1.7). The CHDO PI identifies each area of expertise required and initiates the contact to gather additional data and expertise to resolve the item of concern. In highly visible situations, all parties (AEG, CHDO, and ACO) should conduct conference calls to ensure information is understood and an action plan is agreed upon.

I. Develop and Implement Action Plan (Step 1.8).

1) The CHDO PI implements corrective and/or mitigation strategies to ensure that the operator/air carrier addresses the identified hazard and unacceptable levels of risk. At this stage and after consultations, the action plan is developed, finalized, and then implemented to correct or mitigate the AD noncompliance.

2) The operator carries out the corrective action or mitigation strategy with the CHDO. This process is usually an agreed-upon methodology with the operator and the CHDO. The PI must identify the necessary actions to oversee the operator's correction or mitigation of the hazard and associated levels of risk. The PI must also track and follow up on the operator's corrective actions and should use one or more of the following tools to do so:

a) PTRS.

b) ATOS.

- RMP.
- CATT.
- DOR.

J. Task Outcomes, Document Findings (Step 1.9).

1) Complete the PTRS Record.

a) Use the appropriate Organizational Technical Administration or Aircraft and Equipment PTRS activity code.

b) Record the activity results.

2) Complete the ATOS Record. Use the appropriate ATOS business processes for recording the data collection activities (see Volume 10).

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NOTE: ASIs will document any other information as determined by local, regional, or national guidance.

3) Complete Compliance and/or Enforcement Actions. Take and document other appropriate actions used to correct safety issues or deviations from a regulation or a standard.

- Compliance Action (see Volume 14, Chapter 1, Section 2, Compliance Action Decision Procedure);
- Administrative or Legal Enforcement Action, if deviations are caused by intentional, reckless, or criminal behavior, or if the person(s) is incapable, or unwilling to cooperate (see Volume 14, Chapter 1, Section 2 and FAA Order 2150.3, FAA Compliance and Enforcement Program).

3-4869 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Advisory Circular (AC) 39-7, Airworthiness Directives.
- Aircraft Certification Service (AIR) Quality Management System (QMS) documents available on the AIR QMS Web site at https://my.faa.gov/org/linebusiness/avs/offices/air/qms/doc/master_index.html.
- ATOS RMP, CATT, and DOR.
- FAA Order 8040.1, Airworthiness Directives.
- FAA-IR-M-8040.1, Airworthiness Directives Manual.
- FAA Order 8110.103, Alternative Methods of Compliance (AMOC). (Reference AMOCs and the 24/7 process.)
- Volume 10, Air Transportation Oversight System.
- Volume 14, Compliance and Enforcement.
- FAA Order 2150.3, FAA Compliance and Enforcement Program.

B. Forms. None.

C. Job Aids. None.

3-4870 FUTURE ACTIVITIES. If the inspectors noted deficiencies during the operator's corrective action, they should conduct followup inspections as necessary.

RESERVED. Paragraphs 3-4871 through 3-4874.

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VOLUME 3 GENERAL TECHNICAL ADMINISTRATION

CHAPTER 60 PROCEDURES FOR AVIATION SAFETY INSPECTOR DECISIONMAKING

Section 2 Aviation Safety Inspector Surveillance Decisionmaking

3-4875 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES AND AIR TRANSPORTATION OVERSIGHT SYSTEM (ATOS) BUSINESS PROCESS AND TOOLS.

A. PTRS. Aviation safety inspectors (ASI) (all disciplines) should enter the appropriate surveillance code for the surveillance activity they are accomplishing (e.g., 3627 for a Maintenance Ramp Inspection). In addition, they should enter "ASIDEC" (without quotes) in the PTRS "National Use" box.

B. ATOS Business Process and Tools. Risk management process (RMP), Corrective Action Tracking Tool (CATT), and Dynamic Observation Report (DOR).

NOTE: The ASI will use the appropriate ATOS business process and tools or the National Work Program Guidelines (NPG).

3-4876 OBJECTIVE. This section provides decisionmaking guidance to you, an ASI, when performing surveillance on air carriers, repair stations, or any operator using the NPG. It also provides decisionmaking guidance for you when performing surveillance and you are unable to clearly determine the airworthiness of an operator's aircraft, engine, propeller, or component.

NOTE: For guidance regarding the ASI decisionmaking process for Airworthiness Directives (AD), see Section 1 of this chapter.

3-4877 GENERAL. The Federal Aviation Administration's (FAA) policies and procedures require all ASIs to determine what resources they need to solve difficult and controversial surveillance issues that will eliminate single-person and subjective determinations. ASIs must seek guidance from internal FAA resources, including the certificate-holding district office (CHDO), principal inspectors (PI), Front Line Managers (FLM), office managers, Aircraft Evaluation Groups (AEG), Aircraft Certification Offices (ACO), Regional Offices (RO), and/or appropriate FAA headquarters (HQ)-level branches. ASIs should rely on these resources to gather the appropriate information on which to determine proper surveillance techniques that apply using all related guidance in this order.

3-4878 INTRODUCTION. The FAA is responsible for announcing and enforcing adequate standards and regulations. Title 49 of the United States Code (49 U.S.C.) § 44702(b)(1)(A) specifies, in part, that when prescribing standards and regulations and when issuing certificates, the FAA will give full consideration to "the duty of an air carrier to provide service with the highest possible degree of safety in the public interest." Thus, you should understand that § 44702(b)(1)(A) means this responsibility rests directly with the air carrier, irrespective of any action taken, or not taken, by an FAA inspector or the FAA.

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3-4879 DEFINITIONS.

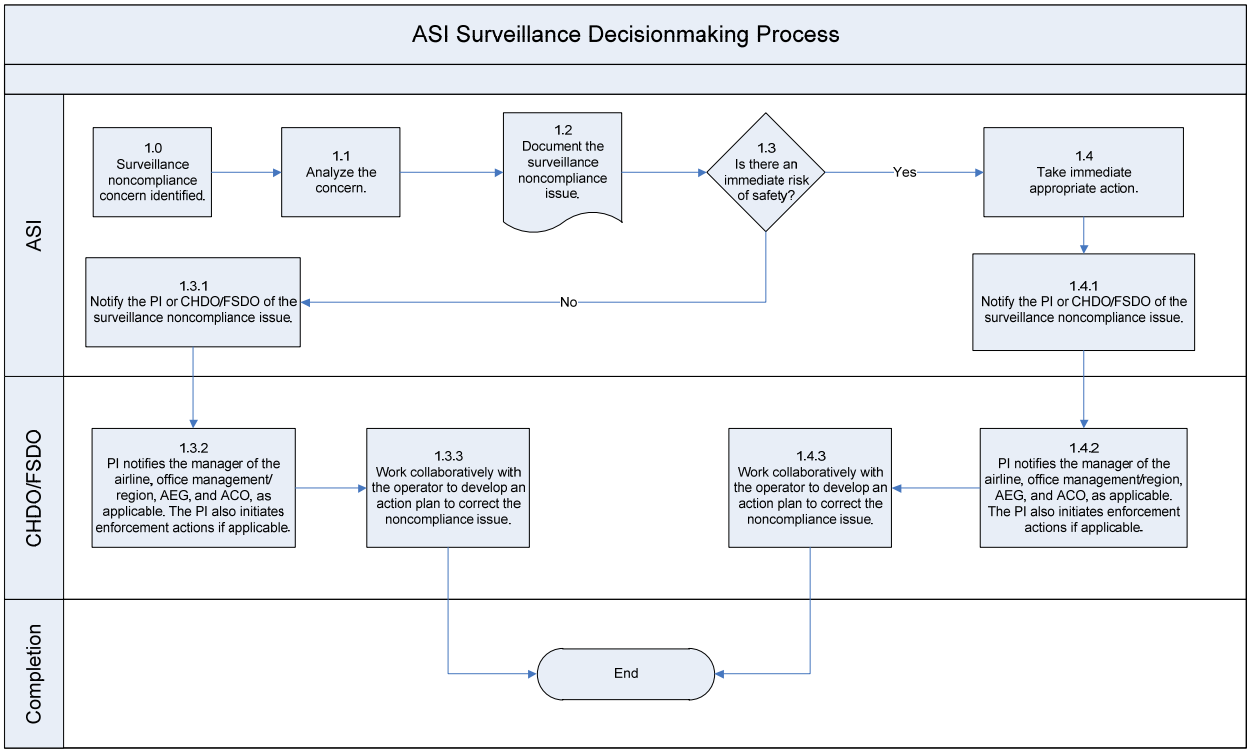
A. Airworthiness. Title 49 U.S.C. § 44704(d) best defines airworthiness by imposing a two-pronged definition. In order to be Airworthy, an aircraft must:

- Conform to its type certificate (TC), and
- Be in condition for safe operation after inspection.

B. Surveillance. The term "surveillance," as used in this order, relates to this ongoing duty and responsibility and related programs. Surveillance programs provide the FAA with a method for a continual evaluation of certificate holder compliance with Title 14 of the Code of Federal Regulations (14 CFR) and safe operating practices. Information generated from surveillance programs permits the FAA to act upon deficiencies and safety issues, which affect, or have a potential effect on, aviation safety.

3-4880 ASI DECISIONMAKING PROCESS. See Figure 3-184, ASI Surveillance Decisionmaking Process, for the following steps.

Figure 3-184. ASI Surveillance Decisionmaking Process



A. Surveillance Noncompliance Concern Identified (Step 1.0).

1) When you suspect noncompliance when performing surveillance activities, you must determine if an actual noncompliance exists. Obtain and review all documents and evidence that pertain to the area of the suspected noncompliance. The documents and evidence may

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contain information to determine the nature and extent of an unsafe condition and what actions are required to correct the condition. You should consider at least these data sources:

- The operator's General Maintenance Manuals (GMM), General Operations Manual (GOM), and Quality Control Manual (QCM);
- The Repair Station Manual (RSM);
- Minimum equipment lists (MEL)/Master Minimum Equipment Lists (MMEL) and Configuration Deviation Lists (CDL); and
- Copies of any maintenance records that apply.

2) After reviewing all pertinent documents and facts, define the concern so you can appropriately analyze the concern in Step 1.1.

B. Analyze the Concern (Step 1.1).

1) After gathering and confirming the facts in Step 1.0, use your experience, ability, knowledge, skills, and professional judgment to analyze and assess the identified concern. By doing so, you may determine the severity and impact on safety.

2) You should visually inspect the aircraft, aircraft engine, propeller, or appliance to which the suspected noncompliance applies in order to determine the exact extent or nature of the noncompliance concern.

3) To understand the scope of noncompliance, you should also use this step to identify and analyze any hazards in the operator's operating environment or systems. This could help you decide if the noncompliance concern is an isolated incident, a systemic problem, regulatory noncompliance, or an airworthiness issue.

C. Document the Surveillance Noncompliance Concern (Step 1.2).

1) After analyzing the concern and data from the previous steps, you should determine if noncompliance exists. If the surveillance activity being conducted reveals noncompliance, you must properly document it. Proceed to Step 1.3 to determine if there is an immediate safety risk.

2) Title 14 CFR part 91, § 91.403; part 121, § 121.363; and part 135, § 135.413 state that the owner or operator/certificate holder is primarily responsible for the airworthiness of its aircraft.

D. Is there an Immediate Safety Risk? (Step 1.3).

1) You should consider the following questions to base your recommendations or decisions of an immediate safety risk. How an individual operator functions will determine this list, which is not all-inclusive:

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- Is this a single aircraft or fleet of aircraft?
- Is the concern an imminent safety hazard?
- Is the aircraft undergoing maintenance?
- Is the aircraft prepared and available for flight?

NOTE: Analyzing the noncompliance concern in Step 1.1 will assist you in answering these questions.

2) You may advise the CHDO/Flight Standards District Office (FSDO) PI to use the RMP or the Repair Station Assessment Tool (RSAT), which provides procedures to manage hazards and their associated risks (see Volume 10, Chapter 3, Section 1, or Volume 6, Chapter 9, Section 2).

3) If the objective evidence does not show an immediate safety risk, proceed with Step 1.3.1, and follow through to Step 1.3.3, as appropriate.

4) If the objective evidence shows an immediate safety risk, see subparagraph H, Take Immediate Appropriate Action, and perform Step 1.4 through Step 1.4.3, as appropriate.

NOTE: An example of determining an immediate safety risk could be during a surveillance inspection. The assigned ASI finds a dent in the wing leading edge, and the aircraft is scheduled for a revenue flight. The ASI determines that the safety risk is low and informs the flightcrew of the problem. This condition would most likely not create a safety hazard if the flightcrew had the dent deferred by maintenance using the appropriate guidance prior to the aircraft departing.

E. Notify the PI or CHDO/FSDO of the Surveillance Noncompliance Concern (Step 1.3.1).

1) Notify the appropriate CHDO/FSDO, PI, and FLM of the surveillance noncompliance concern.

2) The CHDO PI, in collaboration with you, starts gathering data and starts formulating and developing an action plan to correct the noncompliance concern that would help the operator bring its aircraft into compliance.

3) As information becomes available, the CHDO PI may use the RMP or RSAT to continue adjusting the risk assessment (see Volume 10, Chapter 3, Section 1, or Volume 6, Chapter 9, Section 2).

F. The PI Notifies the Manager of the Airline, Office Management/Region, and AEG/ACO, as Applicable (Step 1.3.2).

1) The CHDO PI identifies each area of expertise required and initiates the contact to gather additional data and expertise to resolve the noncompliance concern. In highly visible situations, all parties (i.e., AEG, CHDO, RO, and ACO) should conduct conference calls to ensure everyone understands the information and agrees on an action plan.

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2) CHDO/FSDO PIs should contact the applicable AEG for technical assistance. The AEG acts as a subject matter expert (SME) for delegated type aircraft and works with the applicable ACO to resolve compliance issues. If further technical clarification is necessary with the content of the noncompliance, the AEG acts as a liaison with the appropriate ACO.

3) Determine if the noncompliance concern may be more widespread (e.g., a fleet problem) and needs to be addressed at a broader level and coordinated with the AEGs and the RO.

4) CHDO/FSDO PIs initiate enforcement action if applicable.

G. The PI Works Collaboratively with the Certificate Holder to Develop an Action Plan to Correct the Noncompliance Concern (Step 1.3.3).

1) Based on the office type, and using ATOS or NPG procedures for corrective action, follow appropriate FAA order policy regarding the next steps for correction and/or mitigation to address the identified noncompliance concern.

NOTE: If necessary for action, the PI should consider the data sources identified in Step 1.0.

2) The operator carries out the corrective action with the oversight of the CHDO PI. This process is usually an agreed-upon methodology with the operator and the CHDO. The PI must identify the necessary actions to oversee the operator's correction or mitigation of the noncompliance concern and associated levels of risk. The official notification to the operator of the action plan approval should be in the form of a letter from the CHDO. The PI must also track and follow up on the operator's corrective actions, and should use one or more of the following tools to do so:

a) PTRS.

b) ATOS.

- RMP.
- CATT.
- DOR.

c) Safety Performance Analysis System (SPAS).

d) Enhanced Vital Information Database (eVID).

3) The CHDO PI may elect to continue the action plan within the CHDO. In this case, you will gather all relevant data, documents, and pictures, and provide them to the CHDO PI.

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H. Take Immediate Appropriate Action (Step 1.4).

1) If the affected aircraft is allowed to continue in service, take the appropriate steps to mitigate the safety risk. This step can be as simple as notifying responsible operator personnel (e.g., captain, station manager, or lead mechanic) of the concern and observing operator/air carrier action. You may also exercise FAA authority contained in Volume 8, Chapter 5, Section 12.

2) You should review all documents to determine the nature and extent of the unsafe condition and the nature and extent of the actions required to correct it.

I. Notify the PI or CHDO/FSDO of the Surveillance Noncompliance Concern (Step 1.4.1).

1) After you identify the noncompliance concern as an immediate safety risk, notify the CHDO/FSDO and your FLM.

2) The CHDO PI, in collaboration with you, starts gathering data and starts formulating and developing an action plan to correct the noncompliance concern that would help the operator bring its aircraft into compliance.

3) As information becomes available, the CHDO PI may use the RMP or RSAT to continue adjusting the risk assessment (see Volume 10, Chapter 3, Section 1, or Volume 6, Chapter 9, Section 2).

J. The PI Notifies the Office Management/Region and AEG/ACO, as Applicable (Step 1.4.2).

1) The CHDO PI identifies each area of expertise required and initiates the contact to gather additional data and expertise to resolve the noncompliance concern. In highly visible situations, all parties (i.e., AEG, CHDO, RO, and ACO) should conduct conference calls to ensure everyone understands the information and agrees on an action plan.

2) CHDO/FSDO PIs should contact the applicable AEG for technical assistance. The AEG acts as a SME for delegated type aircraft and works with the applicable ACO to resolve compliance issues. If further technical clarification is necessary with the content of the noncompliance concern, the AEG acts as a liaison with the appropriate ACO.

3) Determine if the noncompliance concern may be more widespread (e.g., a fleet problem) and needs to be addressed at a broader level and coordinated with the AEGs.

4) CHDO/FSDO PIs initiate enforcement action if applicable.

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K. The PI Works Collaboratively with the Certificate Holder to Develop an Action Plan to Correct the Noncompliance Concern (Step 1.4.3).

1) Based on the office type, and using ATOS or NPG procedures for corrective action, follow appropriate FAA order policy regarding the next steps for correction and/or mitigation to address the identified noncompliance concern.

NOTE: If necessary for action, the PI should consider the data sources identified in Step 1.0.

2) The operator carries out the corrective action with the oversight of the CHDO PI. This process is usually an agreed-upon methodology with the operator and the CHDO. The PI must identify the necessary actions to oversee the operator's correction or mitigation of the noncompliance concern and associated levels of risk. The official notification to the operator of the action plan approval should be in the form of a letter from the CHDO. The PI must also track and follow up on the operator's corrective actions, and should use one or more of the following tools to do so:

a) PTRS.

b) ATOS.

- RMP.
- CATT.
- DOR.

c) SPAS.

d) eVID.

3) The CHDO PI may elect to continue the action plan within the CHDO. In this case, you will gather all relevant data, documents, and pictures, and provide them to the CHDO PI.

L. Task Outcomes, Project Completion.

1) Complete the PTRS Record.

a) Use the appropriate surveillance PTRS activity code.

b) Record the activity results.

c) Enter "ASIDEC" (without quotes) in the PTRS "National Use" box.

2) Complete the ATOS/PTRS Record.

a) Use the appropriate ATOS/PTRS business processes for recording the data collection activities (see Volumes 6 and 10).

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b) Document any other information as determined by local, regional, or national guidance.

3) Complete Enforcement Actions. Complete any enforcement actions, as appropriate (refer to the current edition of FAA Order 2150.3, FAA Compliance and Enforcement Program).

3-4881 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- ATOS Data Collection Tool (DCT).
- ATOS RMP, CATT, and DOR.
- eVID.
- FAA Order 2150.3, FAA Compliance and Enforcement Program.
- FAA Order 1800.56, National Flight Standards Work Program Guidelines.
- PTRS.
- SPAS.
- Volume 6, Surveillance.
- Volume 10, Air Transportation Oversight System.

B. Forms. None.

C. Job Aids.

1) See the Flight Standards Evaluation Program (FSEP) applicable job aids listed below:

- 44709 Re-Examination (709).
- Advanced Qualification Program (AQP).
- Air Transportation Designee (ATD).
- Air Transportation Oversight System (ATOS).
- Aviation Event Waivers/Authorizations Job Aid (AVENT).
- Aviation Safety Action Program (ASAP).
- Check Airmen (CHKA).
- Continuing Analysis and Surveillance System (CASS).
- European Aviation Safety Agency Supplement (EASA).
- Flight Crewmember Training Program (FCT).
- General Aviation Designees (GAD).
- General Process (GEN PRO).
- Minimum Equipment List (MEL).
- Operations Specifications (OPSS).
- Part 129 (129).
- Part 142 Training Center (PT142).
- Part 145 (PT145).
- Pilot Deviation Investigation (PD).
- Voluntary Disclosure Reporting Program (VDRP).

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2) Please use the General Process job aid if no other job aid is applicable.

3) You can access the current editions of these job aids at https://my.faa.gov/org/linebusiness/avs/offices/afs/programs/fsep/job_aids.html.

3-4882 FUTURE ACTIVITIES. If you note any deficiencies during the operator's corrective action, you may conduct follow up inspections.

RESERVED. Paragraphs 3-4883 through 3-4886.

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CHAPTER 60 PROCEDURES FOR AVIATION SAFETY INSPECTOR DECISIONMAKING

Section 2 Aviation Safety Inspector Surveillance Decisionmaking

3-4875 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES AND AIR TRANSPORTATION OVERSIGHT SYSTEM (ATOS) BUSINESS PROCESS AND TOOLS.

A. PTRS. Aviation safety inspectors (ASI) (all disciplines) should enter the appropriate surveillance code for the surveillance activity they are accomplishing (e.g., 3627 for a Maintenance Ramp Inspection). In addition, they should enter "ASIDEC" (without quotes) in the PTRS "National Use" box.

B. ATOS Business Process and Tools. Risk management process (RMP), Corrective Action Tracking Tool (CATT), and Dynamic Observation Report (DOR).

NOTE: The ASI will use the appropriate ATOS business process and tools or the National Work Program Guidelines (NPG).

3-4876 OBJECTIVE. This section provides decisionmaking guidance to you, an ASI, when performing surveillance on air carriers, repair stations, or any operator using the NPG. It also provides decisionmaking guidance for you when performing surveillance and you are unable to clearly determine the airworthiness of an operator's aircraft, engine, propeller, or component.

NOTE: For guidance regarding the ASI decisionmaking process for Airworthiness Directives (AD), see Section 1 of this chapter.

3-4877 GENERAL. The Federal Aviation Administration's (FAA) policies and procedures require all ASIs to determine what resources they need to solve difficult and controversial surveillance issues that will eliminate single-person and subjective determinations. ASIs must seek guidance from internal FAA resources, including the certificate-holding district office (CHDO), principal inspectors (PI), Front Line Managers (FLM), office managers, Aircraft Evaluation Groups (AEG), Aircraft Certification Offices (ACO), Regional Offices (RO), and/or appropriate FAA headquarters (HQ)-level branches. ASIs should rely on these resources to gather the appropriate information on which to determine proper surveillance techniques that apply using all related guidance in this order.

3-4878 INTRODUCTION. The FAA is responsible for announcing and enforcing adequate standards and regulations. Title 49 of the United States Code (49 U.S.C.) § 44702(b)(1)(A) specifies, in part, that when prescribing standards and regulations and when issuing certificates, the FAA will give full consideration to "the duty of an air carrier to provide service with the highest possible degree of safety in the public interest." Thus, you should understand that § 44702(b)(1)(A) means this responsibility rests directly with the air carrier, irrespective of any action taken, or not taken, by an FAA inspector or the FAA.

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3-4879 DEFINITIONS.

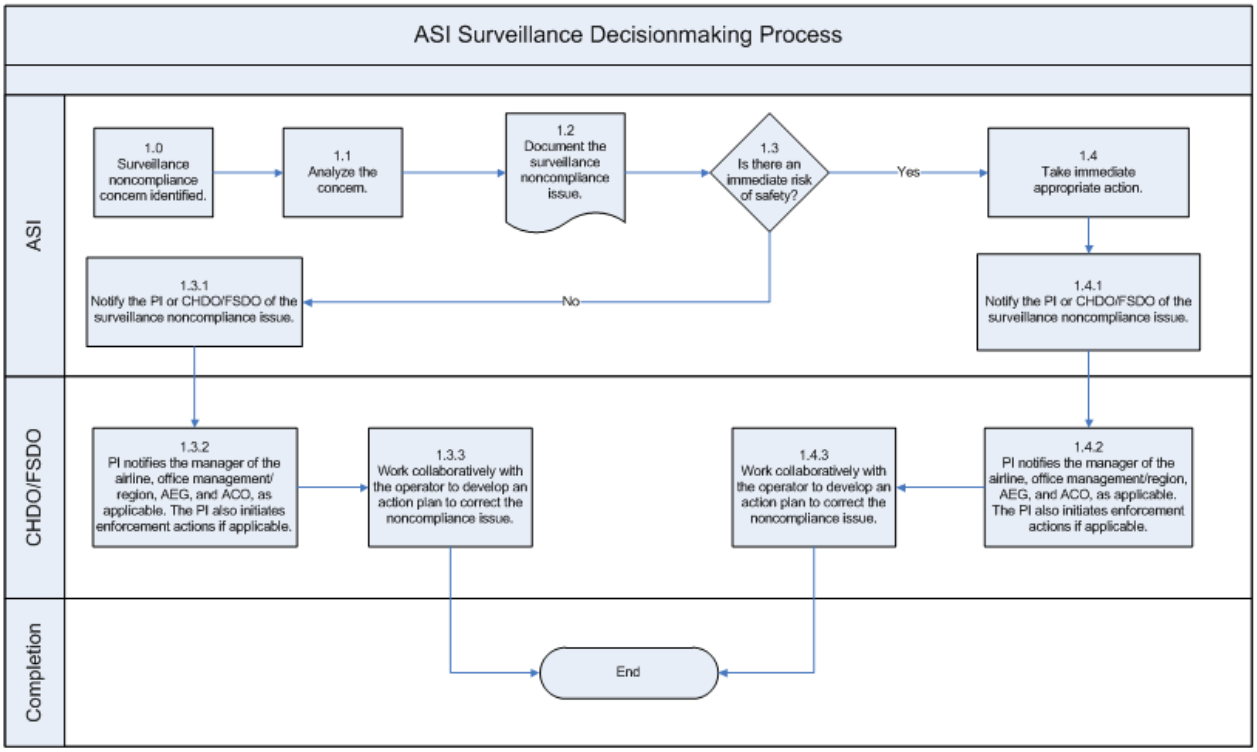
A. Airworthiness. Title 49 U.S.C. § 44704(d) best defines airworthiness by imposing a two-pronged definition. In order to be Airworthy, an aircraft must:

- Conform to its type certificate (TC), and
- Be in condition for safe operation after inspection.

B. Surveillance. The term "surveillance," as used in this order, relates to this ongoing duty and responsibility and related programs. Surveillance programs provide the FAA with a method for a continual evaluation of certificate holder compliance with Title 14 of the Code of Federal Regulations (14 CFR) and safe operating practices. Information generated from surveillance programs permits the FAA to act upon deficiencies and safety issues, which affect, or have a potential effect on, aviation safety.

3-4880 ASI DECISIONMAKING PROCESS. See Figure 3-184, ASI Surveillance Decisionmaking Process, for the following steps.

Figure 3-184. ASI Surveillance Decisionmaking Process



A. Surveillance Noncompliance Concern Identified (Step 1.0).

1) When you suspect noncompliance when performing surveillance activities, you must determine if an actual noncompliance exists. Obtain and review all documents and evidence that pertain to the area of the suspected noncompliance. The documents and evidence may

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contain information to determine the nature and extent of an unsafe condition and what actions are required to correct the condition. You should consider at least these data sources:

- The operator's General Maintenance Manuals (GMM), General Operations Manual (GOM), and Quality Control Manual (QCM);
- The Repair Station Manual (RSM);
- Minimum equipment lists (MEL)/Master Minimum Equipment Lists (MMEL) and Configuration Deviation Lists (CDL); and
- Copies of any maintenance records that apply.

2) After reviewing all pertinent documents and facts, define the concern so you can appropriately analyze the concern in Step 1.1.

B. Analyze the Concern (Step 1.1).

1) After gathering and confirming the facts in Step 1.0, use your experience, ability, knowledge, skills, and professional judgment to analyze and assess the identified concern. By doing so, you may determine the severity and impact on safety.

2) You should visually inspect the aircraft, aircraft engine, propeller, or appliance to which the suspected noncompliance applies in order to determine the exact extent or nature of the noncompliance concern.

3) To understand the scope of noncompliance, you should also use this step to identify and analyze any hazards in the operator's operating environment or systems. This could help you decide if the noncompliance concern is an isolated incident, a systemic problem, regulatory noncompliance, or an airworthiness issue.

C. Document the Surveillance Noncompliance Concern (Step 1.2).

1) After analyzing the concern and data from the previous steps, you should determine if noncompliance exists. If the surveillance activity being conducted reveals noncompliance, you must properly document it. Proceed to Step 1.3 to determine if there is an immediate safety risk.

2) Title 14 CFR part 91, § 91.403; part 121, § 121.363; and part 135, § 135.413 state that the owner or operator/certificate holder is primarily responsible for the airworthiness of its aircraft.

D. Is There an Immediate Safety Risk? (Step 1.3).

1) You should consider the following questions to base your recommendations or decisions of an immediate safety risk. How an individual operator functions will determine this list, which is not all-inclusive:

- Is this a single aircraft or fleet of aircraft?
- Is the concern an imminent safety hazard?

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- Is the aircraft undergoing maintenance?
- Is the aircraft prepared and available for flight?

NOTE: Analyzing the noncompliance concern in Step 1.1 will assist you in answering these questions.

2) You may advise the CHDO/Flight Standards District Office (FSDO) PI to use the RMP or the Repair Station Assessment Tool (RSAT), which provides procedures to manage hazards and their associated risks (see Volume 10, Chapter 3, Section 1, or Volume 6, Chapter 9, Section 2).

3) If the objective evidence does not show an immediate safety risk, proceed with Step 1.3.1, and follow through to Step 1.3.3, as appropriate.

4) If the objective evidence shows an immediate safety risk, see subparagraph H and perform Step 1.4 through Step 1.4.3, as appropriate.

NOTE: An example of determining an immediate safety risk could be during a surveillance inspection. The assigned ASI finds a dent in the wing leading edge and the aircraft is scheduled for a revenue flight. The ASI determines that the safety risk is low and informs the flightcrew of the problem. This condition would most likely not create a safety hazard if the flightcrew had the dent deferred by maintenance using the appropriate guidance prior to the aircraft departing.

E. Notify the PI or CHDO/FSDO of the Surveillance Noncompliance Concern (Step 1.3.1).

1) Notify the appropriate CHDO/FSDO, PI, and FLM of the surveillance noncompliance concern.

2) The CHDO PI, in collaboration with you, starts gathering data and starts formulating and developing an action plan to correct the noncompliance concern that would help the operator bring its aircraft into compliance.

3) As information becomes available, the CHDO PI may use the RMP or RSAT to continue adjusting the risk assessment (see Volume 10, Chapter 3, Section 1, or Volume 6, Chapter 9, Section 2).

F. The PI Notifies the Manager of the Airline, Office Management/Region, and AEG/ACO, as Applicable (Step 1.3.2).

1) The CHDO PI identifies each area of expertise required and initiates the contact to gather additional data and expertise to resolve the noncompliance concern. In highly visible situations, all parties (i.e., AEG, CHDO, RO, and ACO) should conduct conference calls to ensure everyone understands the information and agrees on an action plan.

2) CHDO/FSDO PIs should contact the applicable AEG for technical assistance. The AEG acts as a subject matter expert (SME) for delegated type aircraft and works with the

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applicable ACO to resolve compliance issues. If further technical clarification is necessary with the content of the noncompliance, the AEG acts as a liaison with the appropriate ACO.

3) Determine if the noncompliance concern may be more widespread (e.g., a fleet problem) that needs to be addressed at a broader level and coordinated with the AEGs and the RO.

G. Develop an Action Plan to Correct the Noncompliance Concern (Step 1.3.3).

1) Based on the office type, and using ATOS or NPG procedures for corrective action, follow appropriate FAA order policy regarding the next steps for correction and/or mitigation to address the identified noncompliance concern.

NOTE: If necessary for action, the PI should consider the data sources identified in Step 1.0.

2) The operator carries out the corrective action with the oversight of the CHDO PI. This process is usually an agreed-upon methodology with the operator and the CHDO. The PI must identify the necessary actions to oversee the operator's correction or mitigation of the noncompliance concern and associated levels of risk. The official notification to the operator of the action plan approval should be in the form of a letter from the CHDO. The PI must also track and follow up on the operator's corrective actions, and should use one or more of the following tools to do so:

a) PTRS.

b) ATOS.

- RMP.
- CATT.
- DOR.

c) Safety Performance Analysis System (SPAS).

d) Enhanced Vital Information Database (eVID).

3) The CHDO PI may elect to continue the action plan within the CHDO. In this case, you will gather all relevant data, documents, and pictures, and provide them to the CHDO PI.

H. Take Immediate Appropriate Action (Step 1.4).

1) If the affected aircraft is allowed to continue in service, take the appropriate steps to mitigate the safety risk. This step can be as simple as notifying responsible operator personnel (e.g., captain, station manager, or lead mechanic) of the concern and observing operator/air carrier action. You may also exercise FAA authority contained in Volume 8, Chapter 5, Section 12.

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2) You should review all documents to determine the nature and extent of the unsafe condition and the nature and extent of the actions required to correct it.

I. Notify the PI or CHDO/FSDO of the Surveillance Noncompliance Concern (Step 1.4.1).

1) After you identify the noncompliance concern as an immediate safety risk, notify the CHDO/FSDO and your FLM.

2) The CHDO PI, in collaboration with you, starts gathering data, and starts formulating and developing an action plan to correct the noncompliance concern that would help the operator bring its aircraft into compliance.

3) As information becomes available, the CHDO PI may use the RMP or RSAT to continue adjusting the risk assessment (see Volume 10, Chapter 3, or Volume 6, Chapter 9, Section 2).

J. The PI Notifies the Office Management/Region and AEG/ACO, as Applicable (Step 1.4.2).

1) The CHDO PI identifies each area of expertise required and initiates the contact to gather additional data and expertise to resolve the noncompliance concern. In highly visible situations, all parties (i.e., AEG, CHDO, RO, and ACO) should conduct conference calls to ensure everyone understands the information and agrees on an action plan.

2) CHDO/FSDO PIs should contact the applicable AEG for technical assistance. The AEG acts as an SME for delegated type aircraft and works with the applicable ACO to resolve compliance issues. If further technical clarification is necessary with the content of the noncompliance concern, the AEG acts as a liaison with the appropriate ACO.

3) Determine if the noncompliance concern may be more widespread (e.g., a fleet problem) that needs to be addressed at a broader level and coordinated with the AEGs.

K. Develop an Action Plan to Correct the Noncompliance Concern (Step 1.4.3).

1) Based on the office type, and using ATOS or NPG procedures for corrective action, follow appropriate FAA order policy regarding the next steps for correction and/or mitigation to address the identified noncompliance concern.

NOTE: If necessary for action, the PI should consider the data sources identified in Step 1.0.

2) The operator carries out the corrective action with the oversight of the CHDO PI. This process is usually an agreed-upon methodology with the operator and the CHDO. The PI must identify the necessary actions to oversee the operator's correction or mitigation of the noncompliance concern and associated levels of risk. The official notification to the operator of the action plan approval should be in the form of a letter from the CHDO. The PI must also track

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and follow up on the operator's corrective actions, and should use one or more of the following tools to do so:

a) PTRS.

b) ATOS.

- RMP.
- CATT.
- DOR.

c) SPAS.

d) eVID.

3) The CHDO PI may elect to continue the action plan within the CHDO. In this case, you will gather all relevant data, documents, and pictures, and provide them to the CHDO PI.

L. Task Outcomes, Project Completion.

1) Complete the PTRS Record.

a) Use the appropriate surveillance PTRS activity code.

b) Record the activity results.

c) Enter "ASIDEC" (without quotes) in the PTRS "National Use" box.

2) Complete the ATOS/PTRS Record.

a) Use the appropriate ATOS/PTRS business processes for recording the data collection activities (see Volumes 6 and 10).

b) Document any other information as determined by local, regional, or national guidance.

3) Complete Compliance and/or Enforcement Actions. Take and document other appropriate actions used to correct safety issues or deviations from a regulation or a standard.

a) Compliance Action (see Volume 14, Chapter 1, Section 2, Compliance Action Decision Procedure).

b) Administrative or Legal Enforcement action, if deviations are caused by intentional, reckless, or criminal behavior; or if the person(s) is incapable, or unwilling to cooperate (see Volume 14, Chapter 1, Section 2, Compliance Action Decision Procedure, and FAA Order 2150.3, FAA Compliance and Enforcement Program).

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3-4881 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- ATOS Data Collection Tool (DCT).
- ATOS RMP, CATT, and DOR.
- eVID.
- FAA Order 1800.56, National Flight Standards Work Program Guidelines.
- PTRS.
- SPAS.
- Volume 6, Surveillance.
- Volume 10, Air Transportation Oversight System.
- Volume 14, Compliance and Enforcement.
- FAA Order 2150.3, FAA Compliance and Enforcement Program.

B. Forms. None.

C. Job Aids.

1) See the Flight Standards Evaluation Program (FSEP) applicable job aids listed below:

- 44709 Re-Examination (709).
- Advanced Qualification Program (AQP).
- Air Transportation Designee (ATD).
- Air Transportation Oversight System (ATOS).
- Aviation Event Waivers/Authorizations Job Aid (AVENT).
- Aviation Safety Action Program (ASAP).
- Check Airmen (CHKA).
- Continuing Analysis and Surveillance System (CASS).
- European Aviation Safety Agency Supplement to Repair Stations (EASA).
- Flight Crewmember Training Program (FCT).
- General Aviation Designees (GAD).
- General Process (GEN PRO).
- Minimum Equipment List (MEL).
- Operations Specifications (OpSpecs).
- Part 129 (129).
- Part 142 Training Center (PT142).
- Part 145 (PT145).
- Pilot Deviation (PD) Investigation.
- Voluntary Disclosure Reporting Program (VDRP).

2) Please use the General Process (GEN PRO) job aid if no other job aid is applicable.

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3) You can access the current editions of these job aids at https://my.faa.gov/org/linebusiness/avs/offices/afs/programs/fsep/job_aids.html.

3-4882 FUTURE ACTIVITIES. If you note any deficiencies during the operator's corrective action, you may conduct followup inspections.

RESERVED. Paragraphs 3-4883 through 3-4886.

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VOLUME 4 AIRCRAFT EQUIPMENT AND OPERATIONAL AUTHORIZATIONS

CHAPTER 2 ALL WEATHER TERMINAL AREA OPERATIONS

Section 1 Introduction

4-146 ORGANIZATION AND OVERVIEW OF CHAPTER 2. The description of All Weather Terminal Area Operations (AWTA) and the approval process are divided into 11 sections:

- Section 1 introduces AWTA, providing an overview of concepts and evolution of AWTA, as well as various factors affecting AWTA. This section is historical and conceptual information only. For specific authorizations and requirements, see the following sections;
- Section 2 provides the five-step process for operator approval to conduct Category (CAT) II/III operations (except small Category A aircraft);
- Section 3 provides an approval process for conducting CAT II operations in small Category A aircraft under Title 14 of the Code of Federal Regulations (14 CFR) part 91;
- Section 4 provides guidance for Surface Movement Guidance and Control Systems (SMGCS), including operator requirements and airport authorization by All Weather Operations Specialists (AWOS);
- Sections 5–7 provide respective overviews of CAT I, CAT II, and CAT III operational requirements;
- Section 8 provides specific approval guidance for 14 CFR part 129 operators;
- Section 9 provides specific approval guidance for special instrument approach procedures (IAP);
- Section 10 provides specific approval guidance for maintenance and inspection programs for low-visibility approach landing minimums; and
- Section 11 provides an introduction to performance-based operations.

4-147 GENERAL BACKGROUND. AWTA include all terminal area operations conducted under instrument flight rules (IFR), including certain operations conducted in visual conditions. Terminal area operations conducted under visual flight rules (VFR) in visual weather conditions are not addressed in this chapter. This chapter discusses concepts, national direction, and guidance to be used by Federal Aviation Administration (FAA) inspectors when evaluating, approving, or denying requests for authorization to conduct AWTA operations. This chapter also covers operational approvals for an operator proposing to use new aircraft, AWTA operating systems, lower-than-standard takeoff minimums, and approach and landing operating minimums. The basic principle for AWTA takeoff, approach, and landing operations is that operating minimums are permitted to be reduced through improvements in operational capabilities. This principle is valid only if an acceptable alternative maneuver is maintained or if an extremely high probability of safely completing the maneuver exists. All IAPs are constructed to permit safe instrument flight to the missed approach point (MAP), followed by an instrument missed approach. The safety of conducting an instrument approach to a published minimum and executing the missed approach is not dependent on establishing visual reference with the landing surface. The criteria for constructing an instrument approach are based on the premise that an

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instrument missed approach will be necessary under certain circumstances. Visual reference with the landing surface, however, becomes a safety factor when the flight descends below the published IFR minimum height or altitude. The visibility or Runway Visual Range (RVR) minimum for a particular runway becomes a safety consideration in both fuel planning and selection of alternate airports.

A. AWTA. AWTA in domestic and international operations are complex, with many variations in aircraft and ground equipment, as well as procedures and standards. FAA inspectors must evaluate proposed AWTA, giving due consideration to the following:

- Operator's type of operation (14 CFR part 91, 91 subpart F, 91 subpart K (91K), 121, 129, and 135—fixed-wing or helicopter);
- Type of proposed AWTA (takeoff, landing, etc.);
- Type of operator's aircraft and equipage;
- Airports proposed for use;
- Operating minimums proposed; and
- Operator's experience, both in similar or other aircraft, and in the type of operation proposed.

B. Specific Standards. Specific standards are provided in this chapter to evaluate operations using aircraft and equipment that have well-understood operational characteristics and limitations in specific AWTA. When an operator requests approval to conduct operations not covered by these standards, or when an operator requests to use lower operating minimums than provided by these standards, the request must be forwarded to the regional Flight Standards division (RFSD) Next Generation (NextGen) Branch (AXX-220). AXX-220 will coordinate with the Flight Technologies and Procedures Division (AFS-400) to develop any additional necessary AWTA operational concepts.

C. Authority and Responsibility for Approval of AWTA.

1) The complex nature of AWTA in domestic and international environments, the wide variation of airborne and ground-based equipment, and the variation in procedures and standards used in these operations, require a broad-based evaluation and approval process. Due to operational and technical complexities, it is essential for this evaluation and approval process to use a systems approach (big picture approach).

2) This systems approach must involve many personnel who are knowledgeable in their respective areas. When the safety of a proposed operation is being evaluated, personnel knowledgeable in such areas as aircraft certification, instrument landing system (ILS) ground equipment design and maintenance, visual aid concepts and criteria, IAP design criteria, airport design criteria, flight inspection, air traffic control (ATC) procedures, flight operational programs, and aircraft maintenance programs must be involved.

3) This broad-based systems approach process is particularly important in the evaluation and approval of CAT II and CAT III approach and landing operations. Although approval of CAT I operations is relatively straightforward due to the high level of CAT I

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operational experience and international standardization, CAT II and CAT III operations must be examined and approved on a runway-by-runway and an operator-by-operator basis.

4-148 EVOLUTION OF AWTA. In the early years of aviation, all flight operations were conducted in visual flight conditions. During those early years, electronic ground-based Navigational Aids (NAVAID) were not available and cockpit instrumentation could not support flight in instrument meteorological conditions (IMC). The capability of AWTA slowly evolved as flight instrumentation, airborne navigation equipment, and ground-based electronic NAVAIDs were developed and improved. The development of the gyroscope established the foundation for instrument flight. The essential information provided by the gyroscope permitted pilots to safely control aircraft during instrument flight conditions. Operating minimums were gradually reduced as overall capability for instrument flight improved. The introduction of turbojets for commercial service in 1958 provided the stimulus for further and more rapid refinement of equipment, operating procedures, and standards. For the first 3½ years, turbojet operating minimums for approaches with vertical guidance (called precision approaches) were specified as a ceiling of 300 feet and visibility of ¾ statute mile (sm). These early minimums were modified to a decision height (DH) of 200 feet and a visibility of ¾ sm (RVR 4000), and became known as the "basic turbojet minimums." Included as part of the initial concept of operating minimums was an increase in the operating minimums for air carrier pilots in command (PIC) until 100 hours of flight experience in a particular type of aircraft was obtained. This was determined by adding 100 feet to the published ceiling and ½ sm to the published visibility for each approach. This aspect of the concept of operating minimums is still in use today. The high-minimum PIC requirement is currently specified in parts 91K, 121, and 135 (with RVR landing minimum equivalents in the operations specification (OpSpec)).

4-149 BASIC TYPES OF AWTA APPROACH AND LANDING OPERATIONS. There are two general classes of approach and landing operations: those conducted under VFR, and those conducted under IFR. There are three basic types of IFR approach and landing operations: visual approaches, contact approaches, and instrument approaches.

A. Visual Approaches. A visual approach can be authorized by ATC if the aircraft is being operated under IFR in visual meteorological condition (VMC) (reported weather at airport must have ceiling at or above 1000 feet and visibility of 3 miles or greater). Although a pilot conducting a visual approach is expected to proceed to the destination airport by pilotage or visual reference to another aircraft, the flight remains under an instrument flight plan. ATC retains responsibility for both traffic separation and wake/vortex separation, unless the pilot reports the preceding aircraft in sight and is instructed to follow it. ATC will provide flight-following and traffic information until the aircraft is instructed to contact the control tower. Either ATC or the pilot may initiate a request for a visual approach.

NOTE: Charted visual flight procedures (CVFP), a subset of visual approaches, are also considered to be visual approaches.

B. Contact Approaches. A contact approach can only be authorized by ATC when requested by the pilot. The flight must be operated clear of clouds, the pilot must have at least 1 mile of flight visibility, and can reasonably expect to be able to continue to the airport in those conditions. The pilot must be on an IFR flight plan, and the ground visibility at the destination

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airport must be reported to be at least 1 sm. A contact approach is an approach procedure that may be used by a pilot (with prior ATC authorization) instead of a published Standard Instrument Approach Procedure (SIAP) or special IAP. ATC will not authorize a contact approach at an airport that does not have a functioning IAP. Although ATC provides separation services to a flight during a contact approach, the pilot must assume full responsibility for obstacle clearance and navigation to the destination airport.

C. Instrument Approaches. IAPs are provided to permit descent in instrument conditions from the en route environment to a point where a safe landing can be made at a specific airport.

1) The types of SIAPs include the following approaches based on International Civil Aviation Organization (ICAO) standard NAVAIDs, such as an ILS, Global Positioning System (GPS), Very high frequency (VHF) Omnidirectional Range (VOR), and non-directional radio beacon (NDB). IAPs using these NAVAIDs may require, or may be supplemented by, use of distance measuring equipment (DME).

2) In addition to NAVAID IAPs, there are also IAPs based on ATC radar services such as airport surveillance radar (ASR) and precision approach radar (PAR). SIAPs also include Performance-based Navigation (PBN) procedures that are developed in accordance with U.S. Terminal Instrument Procedures (TERPS) or ICAO Procedures for Air Navigation Services Aircraft Operations (PANS-OPS).

3) Area Navigation (RNAV) and Required Navigation Performance (RNP) concepts are consistent with the performance characteristics of systems such as GPS, DME/DME/Inertial Reference Units (IRU), GPS/DME/DME/IRU, or flight management system (FMS)/GPS, or FMS/GPS/IRU.

D. Lighting System Credits. All straight-in operating minimums are based on the use of ground-based visual aids to enhance seeing-conditions during the final stages of approach and landing operations (deceleration for helicopters). These reductions are known as lighting system credits and cannot be used to reduce operating minimums for circling maneuvers due to the large area required for safe maneuvering (turn radius) at the various speeds used. Therefore, operating minimum reductions based on lighting credits can only be authorized for instrument approaches to runways that provide a straight-in landing capability. The standard minimum IFR altitudes cannot be reduced due to obstacle limitations, NAVAID signal limitations, and/or navigation system limitations. As such, reductions in operating minimums below the basic values established for each type of approach are expressed only as reductions in the visibility/RVR required to safely conduct the approach. The minimums for the various navigation systems and lighting system combinations are specified in the current edition of Order 8260.3, United States Standard for Terminal Instrument Procedures (TERPS).

4-150 EVOLUTION OF CAT I OPERATIONS.

A. Achieving Current CAT I Operating Minimums. Initial steps toward achieving current CAT I operating minimums began on September 28, 1961. These original developments became the foundation for the “building block” approach leading to further reductions in

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operating minimums. The first air carrier operator met these requirements on May 11, 1962, enabling itself to utilize the new reduced minimums of a 200-foot ceiling and ½-sm visibility (RVR 2600). The minimums reductions were based on meeting all of the following requirements:

1) Ground-based NAVAIDs:

- A complete, operational ILS.
- A maximum glideslope (GS) angle of 3 degrees.

2) Ground-based visual aids:

- High Intensity Runway Lights (HIRL).
- Full configuration approach lights with sequenced flashing lights.
- All-weather runway marking or runway centerline (RCL) lights.

3) Airborne equipment:

- A flight director (FD) system or an automatic approach coupler (autopilot).
- An instrument failure warning system or cockpit procedures for assuring the immediate detection of instrument failures or malfunctions.

4) PIC experience, training, and qualification:

- One hundred hours of experience as PIC in the particular type of turbojet or turbine-powered airplane.
- Raw data approach to 200 feet.
- FD and/or autopilot approach to 100 feet.
- ILS approach (FD and/or autopilot as appropriate) to 100 feet, followed by a landing.
- Engine-out ILS approach to a landing or missed approach.

5) Additional runway field length and crosswind component limitations:

- Fifteen percent or 1,000 feet of additional field length (whichever is greater) over normal regulatory requirements.
- Maximum crosswind component of 10 knots.

B. Specifying the Operating Minimums. A major change in the method of specifying the operating minimums for approaches with vertical guidance evolved with the introduction of the DH and RVR concepts. These changes were finalized by the publication of U.S. TERPS criteria in 1966. This conceptual change eliminated the ceiling requirement by introducing a DH. This conceptual change was necessary because of the limitations in the methods used to observe or measure ceiling and visibility. Often ceiling and visibility observations were taken several miles from the approach end of a runway, and as a result were frequently not representative of the seeing-conditions encountered during the final stages of an approach and landing, especially in rapidly changing or marginal weather conditions. Operational use of RVR

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reports began in 1955, but they were not available at most major airports until the early 1960s. Since 1989, all approach and landing operations using minimums below ½-sm visibility have been based on RVR reports.

C. Reduced Operating Minimums. In 1963, operating minimums were reduced further to DH 200/RVR 1800 for two- and three-engine airplanes (usually Category B or C) and DH 200/RVR 2000 for four-engine airplanes (usually Category D). These reductions were based on the "building block" approach established in 1961 and the added requirement for enhanced in-runway lighting systems such as high-intensity touchdown zone (TDZ) and RCL lighting. In 1964, the minimums for runways not equipped with TDZ and RCL lights were reduced to DH 200/RVR 2400. Improvements in visual aids were and remain critical in reducing landing minimums. These aids provide pilots with the necessary external visual references for manually controlling and maneuvering the aircraft during the final approach, flare, landing, and taxiing. The requirement for improvements in the overall airborne and ground-based equipment capabilities, combined with a cautious incremental reduction in operating minimums, ensured that a high level of safety was maintained.

D. Common CAT I Operating Minimums for Aircraft Categories A–D. In 1988, CAT I operating minimums for Category D airplanes were reduced to DH 200/RVR 1800. This change established common CAT I minimums for all airplanes. The 1988 reduction was based on more than 20 years of successful experience with Category B and Category C turbojet aircraft operating to DH 200/RVR 1800, as well as research and analysis. This research has shown that the handling characteristics and seeing-conditions in existing turbojet Category D airplanes were equivalent to other turbojets.

E. Lowest CAT I Operating Visibility Minimums.

1) In 2006, the lowest CAT I operating visibility minimums were revised to harmonize these minimums with the European Aviation Safety Agency (EASA). The majority of harmonized visibility minimums were based on a geometric calculation using the glidepath angle (or published vertical angle), height above threshold (HATh), and length of instrument approach lighting using the following formula: RVR = (HATh ÷ tangent glidepath angle) - length of instrument approach lighting.

2) Standard lengths for four categories of instrument approach lighting were based on the minimum lengths of lighting systems in each category. RVRs for 200 feet HATh were calculated using a glidepath angle of 3 degrees. RVR values were restricted to a minimum of 1800 to retain operationally proven minimum RVRs. Use of visibility minimums below RVR 2400 requires operative TDZ and RCL lighting or use of an approved Head-Up Display (HUD), FD (except single-pilot), or autopilot coupled approach to DH.

3) In 2009, FAA Order 8400.13, Procedures for the Evaluation and Approval of Facilities for Special Authorization Category I Operations and All Category II and III Operations, provided the criteria for Special Authorization (SA) CAT I approaches with a DH as low as 150 feet (HATh using radio altimeter (RA) minimums) and a visibility minimum as low as RVR 1400 at runways with reduced lighting, provided an approved CAT II or CAT III HUD is used to DH.

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4-151 EVOLUTION OF CAT II OPERATIONS.

A. The Concepts and Criteria. The concepts and criteria established in the early 1960s were the building blocks for all CAT II and III operations. The initial criteria for CAT II operations were issued in October 1964. These criteria resulted in a requirement for further improvements in ground-based NAVAIDs, RVR reporting capabilities, airborne equipment, maintenance standards, and pilot training and qualification. Current CAT II criteria are essentially the same as those issued in 1964, except for enhancements to provide additional flexibility and operational credit for modern flight control systems.

B. Guidance During CAT II Operations. During CAT II operations, greater reliance must be placed on the guidance provided by the ground-based NAVAIDs. Therefore, design and maintenance criteria for airborne and ground-based equipment must ensure that better performance and higher reliability are achieved by the total system. For example, before an airport can qualify for CAT II minimums, it must be equipped with an ILS that has greater signal quality, reliability, and integrity. It is also necessary for CAT II runways to have more than one RVR reporting system to provide more accurate information concerning seeing-conditions on the runway. A purpose of these requirements is to supplement the TDZ and RCL lighting required for operations below RVR 1800. Additional airborne equipment is also required, as follows:

- Dual ILS localizer and GS receivers.
- An autocoupler (autopilot) and an FD system, or two independent FD systems.
- Equipment to identify the DH (such as an RA).
- Rain removal equipment.
- Go-around guidance.
- An autothrottle system (for certain aircraft to reduce pilot workload).

C. Initial CAT II Criteria. Initial CAT II criteria were established to provide flexibility to operators in choosing various combinations of airborne equipment to meet CAT II requirements. An operator had to prove (demonstrate) that the performance and reliability of their selected airborne system performed, and continued to perform, at the level of precision and reliability required for CAT II operations. The pilot training and qualification program, through enhanced ground and flight training, also had to provide the pilot proficiency required. This program had to address factors such as the availability and limitations of visual cues in the CAT II environment, as well as the procedures and techniques for transitioning from non-visual to visual flight at low altitude during landing.

D. Type Design Approval Standards for CAT II. CAT II type design approval standards had not been established during initial CAT II operations. As a result, the following methods were established to achieve airborne equipment approval:

1) Operational Demonstration. When the operator's airborne equipment had not been certificated (type design approved) for CAT II operations, the operator was permitted to establish an extensive operational demonstration program. The purpose of this program was to show that the required levels of performance and reliability were attained and maintained. This program consisted of numerous approaches (approximately 300). The operator was also required

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to show that the methods for failure and/or malfunction detection were acceptable to the Administrator.

2) Type Design Approval. When the operator could show that the airborne equipment had been previously tested and expressly approved for CAT II operations during FAA type certification (TC) or Supplemental Type Certification (STC), the operator was not required to conduct as extensive an operational demonstration before receiving initial CAT II approval.

E. Demonstrating That All Initial Criteria Had Been Met. When an operator had demonstrated that all of the initial criteria had been met, initial operations to DH 150/RVR 1600 were authorized. This authorization was known as an "operational approval." Operational approvals were accomplished by the issuance of standard OpSpecs. Following this initial operational approval, the operator was required to demonstrate the ability to maintain the required levels of reliability and performance on a continuing basis in CAT II line operations. After 6 months, assuming continued satisfactory maintenance and performance of the airborne systems, the operator was issued an operational approval to operate with minimums of DH 100/RVR 1200. These basic CAT II criteria for approval are still applicable today but the lowest authorized RVR minimum currently is 1000.

F. CAT II Operations Other than ILS. The only types of CAT II operations that can be currently authorized for use by U.S. operators are ILS-based operations or SA for certain CAT II operations at specifically approved facilities.

4-152 EVOLUTION OF CAT III OPERATIONS.

A. Initial Step in Introducing CAT III Operations. In 1966 at an ICAO Communications/Operations (COM/OPS) divisional meeting, international CAT III ground and airborne equipment standards were established that were essential to further development of ground and airborne equipment and operating concepts.

B. Initial U.S. CAT IIIa Criteria. The initial U.S. CAT IIIa criteria (refer to the current edition of Advisory Circular (AC) 120-28, Criteria for Approval of Category III Weather Minima for Takeoff, Landing, and Rollout) were issued on September 5, 1969, to assist industry in developing a CAT IIIa capability. These criteria were based on the CAT I and CAT II building blocks, and further improvements were required in ground-based NAVAIDs, RVR reporting capabilities, airborne equipment (such as a requirement for autoland), maintenance standards, and pilot training and qualification. These initial criteria did not include definitive operational approval requirements for ground support systems, maintenance, training, and operational procedures and limitations. However, the basic concepts and the minimum airborne equipment type design requirements considered necessary for CAT IIIa operations were clearly delineated in AC 120-28. These basic concepts and equipment requirements included the following:

- Alert height (AH) concept.
- Fail passive (FP) flight control system concept.
- Fail operational (FO) CAT IIIa system concept.
- Autoland concept.

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- Dual radio (radar) altimeter requirements.
- Redundant flight control system requirements.
- Enhanced missed approach instrumentation.
- Autothrottle control system requirements.
- Enhanced failure detection and warning capability.
- Type design approval criteria.

NOTE: "Fail operational (FO)" means an airborne system with redundant operational capability down to touchdown and, if applicable, through rollout. The redundant operational systems must have no common failure modes. If one of the required systems fails below AH, the flare, touchdown, and rollout, if applicable, can be accomplished using the remaining operational system or systems. "Fail passive (FP)" means an automatic flight control system (AFCS), which, upon occurrence of any single failure, should not cause significant displacement from the approach path or altitude loss below the nominal glidepath, or (upon disconnection) involve any significant out-of-trim condition. In addition, any single failure should not cause any action of the flight control system that is not readily apparent to the pilot. Refer to AC 120-28.

C. Initial CAT IIIa Approvals. The publication of initial CAT IIIa criteria (AC 120-28) led to the rapid development of CAT IIIa airborne and ground-based capabilities. In February 1971, the B-747 was granted the first U.S. type design approval for CAT IIIa. This type design approval was based on the use of FO automatic landing systems. CAT IIIa criteria were significantly improved in December 1971, by the publication of AC 120-28A. This revision enhanced the type design (airworthiness certification) approval criteria, and established initial operational approval criteria. Washington-Dulles Airport received the first U.S. CAT IIIa ILS facility approval in January 1972. The type design for the L-1011 was certificated for CAT IIIa using FO autoland systems in April 1972. The first U.S. CAT IIIa operational approval was issued to Trans World Airlines on September 15, 1972, for FO CAT IIIa operations using the L-1011. All initial CAT IIIa operations were restricted to Type III ILS-equipped runways and FO CAT IIIa airborne equipment.

D. Type II ILS-Equipped Runways and FP Airborne Equipment. The criteria initially established for CAT IIIa (AC 120-28) were based on a conservative approach for reducing operating minimums. However, with additional operational experience, it was determined that the initial criteria were unnecessarily stringent.

1) After a thorough review of the Type II ILS equipment, the FAA determined that some Type II installations could be upgraded with minor modification to support CAT IIIa operations. Furthermore, the operational experience of Air Inter in France during extensive CAT III operations (RVR 500) using FP autoland systems indicated that under tightly controlled conditions FP CAT III operations could be safely conducted. Research efforts in the United States and Europe also supported this conclusion.

2) In October 1976, Notice N 8400.18, Job Function Reference Guide for Air Carrier Safety Inspectors (OPERATIONS), was issued to establish approval criteria for FP CAT IIIa autoland operations using DH 50/RVR 700. In December 1976, the B-727 became the

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first airplane certificated by the United States for FP CAT IIIa operations. AC 120-28B, issued in December 1977, permitted CAT IIIa operations at runways equipped with suitably modified Type II ILS equipment. It also permitted FP autoland operations with aircraft having handling characteristics, physical characteristics, and seeing-conditions equivalent to the B-727 and DC-9 airplanes.

3) A Flight Standards Service (AFS) policy decision, expressed in a letter dated June 22, 1978, authorized CAT IIIa operations to 32 runways equipped with Type II ILS equipment at 31 airports. FAA Order 8400.8, Procedures for the Approval of Facilities for FAR Part 121 and Part 135 CAT III Operations, was initially issued on September 10, 1980, to enhance the criteria and procedures for approving CAT III operation using U.S. Type II ILS facilities. These changes significantly increased the number of facilities that could support CAT IIIa operations and the number of aircraft that could potentially use these facilities.

4) As of 2010, all systems supporting CAT II or CAT III operations (Mark 20 systems) meet the integrity requirements of a Type III system. The lowest landing minimum currently (2010) authorized for CAT IIIa by U.S. operators at any airport is RVR 700. Consideration is being given to reducing the minimum RVR to 600 in order to harmonize U.S. CAT IIIa standards with ICAO.

E. Initial CAT IIIb Criteria. As operational experience and capability of airborne equipment increased in CAT IIIa operations, the need for CAT IIIb criteria was gradually realized. Initial U.S. CAT IIIb criteria were issued in March 1984 (AC 120-28C). This revision permitted operations with minimums as low as RVR 300. The B-767 became the first aircraft certificated (type design approval) for CAT IIIb by the United States. The B-767 was approved under a final draft version of that AC. The initial CAT IIIb criteria were based on the CAT I, CAT II, and CAT IIIa building blocks.

1) Further enhancements were required in the CAT IIIb criteria, particularly in ground-based NAVAIDs, lighting systems, RVR reporting systems, airborne equipment, and training and qualification programs. These revisions further clarified CAT III operational concepts, system requirements, and the visual references necessary for the various CAT III operations. Another conceptual change was implemented by establishing concepts for CAT III operations with the “pilot in the active control loop.” These new concepts permitted manually-flown CAT III operations using special flight guidance and control systems such as HUDs.

2) The first U.S. CAT IIIb operational approvals were granted to Trans World Airlines (L-1011) and Eastern Airlines (L-1011 and A300) using minimums of RVR 600. RVR 600 was the lowest minimum supported by U.S. facilities due to RVR reporting system limitations. The first CAT IIIb RVR 300 minimum approvals were granted to Delta and Eastern Airlines in September 1984, for L-1011 aircraft. Initial RVR 300 approvals were restricted to those airports equipped with CAT III taxiway RCL lights and the capability to report RVRs as low as RVR 300. The first U.S. CAT IIIb RVR 300 ILS facility approval was granted for runway 16R at Seattle-Tacoma International Airport (SeaTac) in 1987.

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4-153 CURRENT CATEGORIES OF IAPs. Various categories of instrument approach operations have been established to accommodate a wide variety of airborne and ground- or space-based capabilities. These operational categories are necessary for granting credit to operators choosing to install airborne equipment with additional capabilities. These operational categories also provide the distinction between operational capabilities and ground support system configurations. CAT I, CAT II, and CAT III are the three basic categories of instrument approach operations.

A. CAT I Operations. CAT I operations are defined as precision approach and landing operations conducted under IFR using CAT I operating minimums. CAT I operating minimums consist of a specified IFR decision altitude (DA)/DH that is not lower than the equivalent of 200 feet (60 meters) above the TDZ, and a visibility, Runway Visibility Value (RVV), or an RVR that is not lower than ½ sm or RVR 1800, respectively.

B. SA CAT I. The current edition of FAA Order 8400.13 authorizes SA CAT I approaches to an RA DH as low as 150 feet and a visibility minimum as low as RVR 1400 to runways that do not have TDZ or RCL lighting when the approach is flown using an aircraft with a HUD to DH.

C. Standard CAT II Operations. CAT II operations are approach and landing operations conducted with a DH of less than 200 feet (60 meters) but not less than 100 feet (30 meters), and an RVR of not less than 1,200 feet (350 meters).

D. CAT II RVR 1000. Order 8400.13 authorizes CAT II approaches with a DH as low as 100 feet and visibility minimums of RVR 1000 to runways that meet all CAT II equipment, performance, and lighting requirements. The operator must use either autoland or HUD to touchdown.

E. SA CAT II. Order 8400.13 authorizes CAT II approaches with a DH as low as 100 feet and visibility minimums of RVR 1200 at runways that do not meet all of the lighting requirements (Approach Lighting System With Sequenced Flashing Lights (ALSF)-2, TDZ, RCL lights) for standard CAT II. The operator must use either autoland or HUD to touchdown.

F. CAT III Operations. CAT III operations are separated into three subcategories: CAT IIIa, CAT IIIb, and CAT IIIc.

1) CAT IIIa Operations. CAT IIIa is an approach and landing operation with an RVR of not less than 700 feet (200 meters) without a DH, or with a DH of less than 100 feet (30 meters), or an AH that is typically between 50 and 200 feet, depending on aircraft certification and operator preferences. Both FP and FO airborne equipment can be used in CAT IIIa operations.

2) CAT IIIb Operations. CAT IIIb is an approach and landing operation with an RVR of less than 700 feet (200 meters) but not less than 150 feet (50 meters) and a DH of 50 feet (15 meters) or less, or an AH which is typically between 50 and 200 feet, depending on aircraft certification and operator preferences. Both FP and FO airborne equipment can be used for CAT IIIb operations.

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3) CAT IIIc Operations. CAT IIIc is an approach and landing operation without a DH and without RVR limitations (zero-zero). CAT IIIc operations are currently not authorized.

4-154 IAPs.

A. SIAP.

1) SIAPs that are published in accordance with 14 CFR part 97 without Authorization Required (AR) or Special Aircrew and Aircraft Certification Required (SAACR) restrictions are approved for all users of the U.S. National Airspace System (NAS) and are incorporated in the standard OpSpecs by reference.

2) If an IAP is published in part 97 and designated as an AR or SAACR procedure, it is only available to those operators, aircraft, and aircrews that meet the special qualification requirements for that procedure and that are approved to use it. An IAP is a series of predetermined maneuvers for the orderly and safe transfer of an aircraft under instrument flight conditions, from the beginning of the initial approach to one of the following:

- An automatic landing.
- A position from which a landing can be made visually.
- A position from which a missed approach can be executed and completed if external visual references necessary to complete the landing are not established before passing DA/DH or minimum descent altitude (MDA)/MAP.

B. IAPs and Their Operating Minimums. An instrument approach and its operating minimums are usually prescribed and approved for a specific airport and/or runway by the aviation authority (AA) that has jurisdiction over flight operations at that airport. The FAA is responsible for developing all civil IAPs and for specifying the operating minimums for all IAPs in the United States and its territories, and the U.S. Army IAPs worldwide. In the case of other military IAPs, an instrument approach and its operating minimums are prescribed and approved for a specific airport and/or runway by the authority having jurisdiction over flight operations. There are various types of IAPs that are or may be approved for use by U.S. air carriers. These types of IAPs include the following:

- IAPs published in accordance with part 97.
- IAPs authorized in OpSpecs.
- FAA-approved special IAPs (FAA Form 8260-7, Special Instrument Approach Procedure).
- Department of Defense (DOD) IAPs at U.S. military airports.
- IAPs published by a foreign country.
- IAPs developed by an air carrier in a foreign country in accordance with the current edition of FAA Order 8260.31, Foreign Terminal Instrument Procedures (FTIP).

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C. CVFPs. Even though CVFPs are available for public use by aircraft on IFR flight plans, they are not standard Instrument Flight Procedures (IFP). Except for CVFPs, it may be assumed that any SIAP charted in a U.S. Government Flight Information Publication (FLIP) is appropriately published in part 97.

4-155 OTHER IAPs. If, however, an IAP and its operating minimums are not published in accordance with part 97, other means have been established to authorize their use. In such cases, the IAP is incorporated into standard OpSpecs by reference (either with or without additional restrictions). This group of instrument procedures that are not published in part 97 includes IAPs developed by the FAA, third party developers, certain U.S. military organizations, foreign governments, and air carriers, and IAPs based on nonstandard NAVAIDs such as Tactical Air Navigational Aid (TACAN), Tactical Landing Approach Radar (TALAR), airborne radar, or commercial broadcast stations. Many of these approach procedures are not available to all users due to the location, special training, knowledge, or equipment required to safely conduct them.

A. U.S. Military IAPs. U.S. military IAPs are approved by the local base commander and published by the DOD. Since these procedures comply with U.S. TERPS criteria, U.S. military IAPs must be used by air carriers when operating at military airports, unless the procedure is noted “Not for Civil Use” by the military. IAPs published by the DOD for U.S. military airports are incorporated into the standard OpSpecs by reference.

B. Foreign Government IAPs. At foreign airports, the authority having jurisdiction over flight operations at the airport establishes the IAPs and their operating minimums. In general, the IAPs and operating minimums (if specified) at most foreign airports are developed in accordance with U.S. TERPS or ICAO PANS-OPS criteria. IAPs developed by foreign authorities using TERPS or PANS-OPS are approved for use by U.S. air carriers in accordance with FAA Order 8260.31 and are incorporated in the standard OpSpecs by reference. In some cases it may be necessary to restrict certain foreign IAPs to make them equivalent to U.S. or ICAO criteria. FAA Order 8260.31 provides direction and guidance for restricting such foreign IAPs. When a restriction to a foreign IAP is required, it must be specified in OpSpec C058.

C. IAPs Developed by an Air Carrier. At some foreign airports, an air carrier may need to develop or choose to develop an IAP. The standard OpSpecs enable an air carrier to exercise this option, provided the developed procedure meets either U.S. TERPS or ICAO PANS-OPS criteria. In such cases, the IAP developed by the air carrier may be authorized for use by listing it in OpSpec C081, provided the air carrier submits appropriate supporting information in accordance with FAA Order 8260.31. These procedures may be based on either public or private NAVAIDs.

D. Non-Federal NAVAIDs. Non-Federal NAVAIDs can be used for public and special IAPs. Approval for the use of these NAVAIDs within the NAS is established in the current edition of Order 6700.20, Non-Federal Navigational Aids and Air Traffic Control Facilities, and 14 CFR part 171. An inspector should become familiar with these documents before issuing approval to use these IAPs. Approval to use special IAPs based on non-Federal NAVAIDs is accomplished by listing them in OpSpec C081.

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E. Commercial Broadcast Station IAPs. In the past, limited authorizations to use commercial broadcast stations have been granted in unique situations. The need for these procedures has been steadily declining because of the increased availability of standard NAVAIDs. In general, new approach procedures based on commercial broadcast stations will not be approved. In any case, AFS-400 review and concurrence must be obtained before an inspector may approve an IAP based on commercial broadcast stations.

F. Special IAPs. Special IAPs are those procedures evaluated and approved by the FAA but not published in accordance with part 97. These special IAPs are not approved for general use due to the special training, private facilities, procedures, knowledge, and/or equipment required to safely conduct them. Due to these special requirements, the use of special IAPs must be authorized on an operator-by-operator basis. Special IAPs are issued on FAA Form 8260-7 and authorized in OpSpec C081.

G. IAPs Outside of Controlled Airspace. Since ATC separation services are an important element of safe instrument approach operations, special consideration and evaluation are required before operations can be authorized outside of controlled airspace (no ATC separation services available). This situation occurs when conducting an IAP at an airport that is in Class G airspace (i.e., does not have an operating control tower or when a control zone is not active). The airports, at which portions of IAPs are outside of controlled airspace, must be authorized by the standard OpSpec C064.

H. Airborne Radar Approaches (ARA). ARAs are based on the use of airborne radar. Within the United States, ARAs are classified as special IAPs and are established by the issuance of FAA Form 8260-7. Use of ARAs can be authorized through standard OpSpecs if the criteria in the current edition of AC 90-80, Approval of Offshore Standard Approach Procedures, Airborne Radar Approaches, and Helicopter En Route Descent Areas, and this order are met.

I. Offshore Standard Approach Procedures (OSAP). OSAPs are helicopter specials that are designed for use to offshore platforms. OSAPs are based on the use of GPS and the airborne radar systems and are established and approved in accordance with the criteria in AC 90-80. These special procedures are developed for individual operators and are issued and authorized through OpSpecs, management specifications (MSpecs), or letters of authorization (LOA).

4-156 CONSIDERATIONS FOR APPROACH AND LANDING OPERATIONS. U.S. TERPS contains the established minimum criteria for standard IAPs within the U.S. NAS. PANS-OPS, Volume II, contains the established minimum criteria for IAPs in most foreign countries. These criteria allow for safe instrument approach and landing capabilities for aircraft equipped with ICAO standard NAVAIDs (ILS, GPS, VOR, VOR/DME, and NDB) and performance-based approaches based on RNP concepts. Many operators have chosen to use airborne equipment exceeding the minimum capabilities required for instrument flight. A means of granting operational credit for using equipment with these increased capabilities has been established. The standard OpSpecs provide the method to approve approach and landing operations using such airborne equipment. Examples of airborne equipment with increased capabilities include automatic landing systems (autoland) and manually flown electronic landing

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systems (HUD), ARA systems, and RNAV systems with RNP and RNP AR capabilities. The following subparagraphs briefly discuss these systems.

A. Autoland.

1) Autoland Approach. An autoland approach is an instrument approach to touchdown, and in some cases, through the landing rollout. An autoland approach is performed by the aircraft autopilot, which is receiving position information and/or steering commands from onboard navigation equipment. Autoland approaches are flown in VFR and IFR. It is a commonly accepted safe operating practice for operators to require their aircrews to fly coupled approaches and autoland approaches (if certified) on suitable runways when the weather conditions are less than approximately RVR 4000.

2) Automatic Landing Systems. As an example of modern airborne equipment, the autoland is often standard on many new airplanes. This modern system gives the aircrew increased capabilities by enabling them to make safer instrument approaches and landings than those being done without the autoland. Autoland also refers to the landing that is accomplished with the autoland engaged. The aircrew is required to constantly monitor this system to ensure safe operation of the aircraft.

3) General Information. Many large transport category airplanes are equipped with autoland systems and a few helicopters are equipped with automatic deceleration and hover systems. As technology evolves, the trend of using autoland systems is increasing. Autoland systems are already standard features on many new airplanes. An air carrier, however, is not authorized to use autoland systems to touchdown in parts 121 and 135 operations unless the particular flight control guidance system is authorized for autoland by the OpSpecs. Part 121, § 121.579 and part 135, § 135.93 prohibit the use of most autopilots below certain heights (50 feet or greater) during approach and landing operations, even during VFR weather conditions. The intent of these rules is to provide pilots with the terrain or obstacle clearance and the reaction time necessary to safely intervene if the autopilot malfunctions.

4) Pilot Intervention. This is especially critical if the autopilot abruptly commands a hard-over, nose-down condition. Many autopilots (“single channel” autopilots) used in parts 121 and 135 operations are not designed to provide the redundancy necessary to automatically detect all failure combinations. If such failures occur, the pilot must intervene, disconnect the autopilot, and recover manually. Since an aircraft will lose altitude if a hard-over, nose-down condition occurs, the autopilot must be routinely disengaged before descending below the height above terrain specified by § 121.579 or § 135.93, as appropriate. Failure to disconnect the autopilot before descending below these heights could lead to ground contact during a recovery attempt if a malfunction occurred. Many aircraft are now equipped, however, with an automatic flight control guidance system (AFCGS) designed to provide the performance, redundancy, and reliability necessary to detect all significant failure combinations and to prevent the autopilot from failing in a hard-over, nose-down condition (zero height loss). With these aircraft and equipment combinations, the safety objective of §§ 121.579 and 135.93 can be met even if the system is used to touchdown. FP and FO automatic landing systems provide this capability and can be approved for use to touchdown. The operator’s approved training curriculum must include training on autoland operations and the autoland equipment must be

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properly certificated and maintained. Principal operations inspectors (POI) shall authorize the use of autoland to touchdown by issuing OpSpec C061 in accordance with § 121.579(c) or § 135.93(d).

B. Manually Flown Flight Control Guidance Systems Certificated for Landing Operations (HUD). Historically, pilots have not had FD systems and other instrument information that enabled safe manual control of an aircraft to touchdown in instrument conditions. The development of flight control guidance systems such as HUD provides the pilot with instrument information in a manner that enables safe manual control of the aircraft through touchdown and rollout. The flight guidance provided by these systems enables a pilot to duplicate the performance and functions of an autoland system. These systems provide flight guidance information equivalent to the performance, redundancy, reliability, and the hard-over, nose-down protection provided by autoland systems, which are approved for use to touchdown. Manually flown flight control guidance systems certified for landing operations can be approved for use to touchdown. The operator's approved training curriculums must include training on such manually flown operations, and the equipment must be properly certificated and maintained. Use of these manually flown systems to touchdown can be authorized by the issuance of OpSpec C062 in accordance with this order.

4-157 CONCEPT OF CIRCLING MANEUVERS.

A. Instrument Approach Design Criteria. In many situations, instrument approach design criteria will not permit a straight-in approach to the landing runway. In these situations, a circling procedure is necessary to maneuver the aircraft to a landing on the intended runway. Circling maneuvers are usually necessary when there is an obstacle or terrain problem. Circling maneuvers are also required when a NAVAID is located in a position that precludes a straight-in approach to the intended landing runway. U.S. criteria require a circling maneuver if the inbound course is offset more than 30 degrees from the RCL. Unless specifically restricted in the procedure, a circling maneuver can be initiated from any IAP and must be conducted entirely by external visual references. Electronic course or glidepath guidance cannot be used to perform a circling maneuver.

B. The Circling Maneuver. A circling maneuver is not an instrument maneuver. Sufficient visual references for manually maneuvering the aircraft to a landing must be maintained throughout a circling maneuver. The pilot must keep the aircraft's position within the established maneuvering area while performing the circling maneuver. The circling MDA must be maintained until an aircraft (using normal maneuvers) is in a position from which a normal descent (less than 1,000 feet per minute (fpm)) can be made to touchdown (decelerate to air taxi or hover for helicopters) within the TDZ. It is critical for pilots to understand that the published missed approach procedure may not provide adequate obstacle clearance, especially during the initial portion of a missed approach executed during a circling maneuver. The published missed approach is designed to provide obstacle clearance only when the missed approach is executed on the published final approach course at or above the MDA, and before passing the MAP. A published missed approach may not guarantee the necessary safety margin when a missed approach is executed past the MAP and/or below the MDA. The aircraft must remain within the established circling maneuvering area until the aircraft is at or above the MDA and established

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on the missed approach course. The following statements summarize the basic concepts of a circling maneuver:

- A circling maneuver is a visual maneuver.
- Sufficient visual references to manually maneuver the aircraft to a landing must be maintained throughout a circling maneuver.
- The aircraft must be maintained at the MDA until it is at a position from which a safe landing can be made.
- A missed approach must be executed when external visual references are lost or sufficient visual cues to manually maneuver the aircraft cannot be maintained.

C. Missed Approach Procedure. The traditional published missed approach procedure does not guarantee obstacle clearance during the initial phases of a missed approach if initiated during a circling maneuver after descending below MDA or after MAP. When a pilot loses visual reference while circling to land, follow the missed approach specified for the approach procedure. An initial climbing turn toward the landing runway will ensure that the aircraft remains within the circling obstruction clearance area. Continue to turn until established on the missed approach course. An immediate climb must be initiated because obstacle clearance is not guaranteed beyond the MAP.

4-158 LOOK-SEE APPROACHES. A look-see approach is not an actual type of approach, such as ILS or RNAV (GPS). Rather, it is a term used to describe the operation of commencing and continuing an instrument approach to DA/DH or MDA to determine if the seeing-conditions actually available at those points are sufficient to continue to a landing. Look-see approaches are approaches that can be started and then continued to the DA/DH or the MDA and the MAP, even when the weather conditions are reported to be below the authorized IFR landing minimums. This operation applies domestically only to part 91 operators. This operation may be conducted in certain foreign countries by part 121 operators. Upon arrival at the MDA and before passing the MAP, or upon arrival at the DA/DH, the approach may be continued below DA/DH or MDA if the seeing-conditions required by § 121.651(c) or part 91, §§ 91.175(c) and 91.175(1) are met. A pilot can continue to land using external visual reference if the necessary seeing-conditions are established before passing DA/DH or MDA/MAP. The operational need for look-see approaches is created by wide variations among foreign countries in weather observing and weather reporting practices, and by limitations associated with manually derived and forwarded weather reports (especially during rapidly changing weather conditions). The weather observation is often taken from a location that is several miles from the landing surface, and may not be representative of seeing-conditions encountered at DA/DH, MDA/MAP, or during landing. Part 121 operators may conduct look-see approaches at foreign airports (civil and military) unless the foreign country specifically prohibits them. Part 121 operators, however, are prohibited from conducting look-see approaches at all U.S. airports including U.S. domestic, U.S. territorial, and U.S. military airports (including U.S. military airports in foreign countries). Part 135 operators are prohibited from conducting look-see approaches at all airports, both domestic and foreign, by § 135.225.

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4-159 CONCEPTS OF DA/DH.

A. DA/DH Concept. The DA/DH concept is the foundation for CAT I and CAT II approach and landing operations. It is also an essential concept in certain CAT III operations. This concept evolved after the introduction of turbojets in 1958. It was established to resolve problems created by the use of a ceiling as an element of operating minimums, especially during rapidly changing weather conditions. The use of the DA/DH concept also enhances safety of operations in degraded seeing-conditions. A DA/DH is established to require that the pilot, at the specified height, decide whether adequate visual references are available for accomplishing the following actions:

- Verifying that the aircraft is in a position that will permit a safe landing in the TDZ.
- Determining that sufficient external visual references are available to manually maneuver the aircraft (or assess autopilot maneuvering in CAT II and CAT III operations) into alignment with the RCL.
- Determining that the aircraft can be maneuvered to touchdown within the TDZ, that directional control can be maintained on the runway, and that the aircraft can be stopped within the available runway length.
- For helicopter operations, determining that sufficient visual references are available to maneuver the helicopter to align with the landing area; to decelerate to air taxi or to hover; and to maintain directional control while air taxiing.

B. Operational Viewpoint. From an operational viewpoint, DA/DH is the limit to which a pilot can descend before having to decide to continue the approach by visual means. If the visual references required to safely continue the approach have not been established before passing DA/DH, a missed approach must be executed at DA/DH. This does not mean that a pilot waits until arriving at DA/DH before deciding to go around or to continue the approach based on visual references.

1) The decisionmaking process begins when the approach is initiated and continues throughout the approach. A pilot must continually evaluate course and glidepath displacement information throughout the approach. Knowing that significant changes cannot occur instantaneously, a pilot begins to formulate a decision concerning the probable success of the approach long before reaching DA/DH.

2) Although DA/DH is a specified point in space (PinS) at which a pilot must make an operational decision, the pilot accumulates the information required to make that decision throughout the approach. It is incorrect to assume that all aspects of the decisionmaking process are delayed until the critical instant the aircraft arrives at DA/DH. The visual cues, which become available during the descent to DA/DH, enhance the pilot's formulation of the decision, which must be made at DA/DH.

3) The operational decision to continue the approach by visual means, however, must be made before passing DA/DH. At DA/DH, a decision to continue the approach by reference to visual cues is appropriate if a pilot is satisfied that the total pattern of the visual cues provides sufficient guidance and that the aircraft is in a position and tracking so as to remain

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within a position from which a safe landing can be made. However, if a pilot is not satisfied that all of these conditions exist, a missed approach must be executed.

C. Before Passing DA/DH. The decision that the pilot must make before passing DA/DH is not a commitment to land. It is a decision to continue the approach based on visual cues. This distinction is important since the possibility exists that, after passing DA/DH, visual cues may become inadequate to safely complete the landing, or the aircraft may deviate from the flightpath to a point where a safe landing cannot be assured. Since many variables are involved, the final decision to commit to a landing is the PIC's and is primarily a judgment based on all the relevant operational factors. The PIC shall usually delay the decision to commit to a landing until the final stages of flare and landing.

1) The following is a list of statements that describe what DA/DH is.

- DA/DH is a specified decision point.
- DA/DH is the point at which a specific action must be initiated (either continue the approach by reference to visual aids or go-around).
- DA/DH is the limit to which a pilot can descend before having to decide to continue the approach using external visual references.

2) The following is a list of statements that describe what DA/DH is not.

- DA/DH is not a point where the decisionmaking process begins.
- DA/DH is not the latest point at which a go-around could or should be made.
- DA/DH is not a point where all aspects of the decision are instantaneously formulated.

D. Vertical Navigation (VNAV) Approach Procedures Using DA/DH—OpSpec C073. Based on near-term safety benefits of using a continuously defined Vertical Path (VPATH) to the runway, and a long-term goal of simplifying approach training and qualification standards, users have indicated their intent to begin additional use of VNAV capability for instrument approaches. The applicable procedures, operating criteria, and revisions to the operator's OpSpecs, if applicable, to permit additional use of VNAV capability of FMS for IAPs are contained in Volume 3, Chapter 18, Section 5.

4-160 CONCEPT OF MDA AND MAP. The MDA/MAP concept is the foundation for safe CAT I approach operations that do not have VPATH guidance (e.g., VOR or lateral navigation (LNAV)). Electronic glidepath information cannot be provided at certain locations because of obstacle or terrain problems, NAVAID sighting problems, and cost benefit factors. The MDA/MAP concept provides for safe approach operations in instrument conditions at locations that do not have VPATH guidance.

A. MDA. An MDA is the lowest permissible height (for a Nonprecision Approach (NPA) procedure) at which an aircraft can be controlled by reference only to instrument information. After passing the final approach fix (FAF), a pilot should descend on a VPATH that will enable a stabilized approach and, if the visual conditions are adequate, a descent to the runway without any intermediate level off at the MDA. If the visual conditions are

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not adequate, the pilot must level off at the MDA until sufficient visual references are available to safely complete the approach and landing. For unusual approach procedures and environmental conditions (offset final course, crosswinds, icing, etc.) a pilot may descend to the MDA at an expedited rate (not to exceed 1000 fpm).

B. Establish an MDA. An MDA is established to require that the pilot, before descending below the specified height and before passing the MAP, determines that adequate visual references are available for accomplishing the following actions:

- Verifying that the aircraft is in a position that will permit a safe landing in the TDZ.
- Determining that sufficient visual references are available to manually maneuver the aircraft to align it with the RCL, touchdown within the TDZ, and maintain directional control on the runway.
- For helicopter operations, determining that sufficient visual references are available to maneuver the helicopter to align with the landing area, decelerate to air taxi or hover, and maintain directional control while air taxiing.

1) The following is a list of statements that describe what MDA is.

- MDA is the lowest permissible height at which an approach can be continued by reference solely to flight instruments.
- MDA is the limit to which a pilot can descend before having to decide whether or not to continue the approach by using external visual references.
- MDA is the minimum height above the surface to which the aircraft can descend, unless the pilot determines that the aircraft is in a position from which it can be safely maneuvered using normal rates of descent (less than 1,000 fpm) to a touchdown within the TDZ (decelerate to air taxi or hover for helicopters).

1) The following is a list of statements that describe what MDA is not.

- MDA is not a specified decision point.
- MDA is not a point at which a specific action is initiated.
- MDA is not a point where the decision process begins.
- MDA is not the latest point at which a go-around could or should be made.
- MDA is not a point where all aspects of the decision are instantaneously formulated.

C. MAP. For an approach that does not have vertical guidance, it is necessary to define a point on or near the airport where a missed approach must be executed, if adequate external visual references for safely continuing the approach are not available. This point is specified as the MAP. A MAP is a three-dimensional (3-D) airborne position where the MDA passes over a specified geographic fix.

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1) The following is a list of statements which describe what MAP is.

- MAP is a specified decision point.
- MAP is the last point at which the approach can be continued by reference solely to flight instruments. After the MAP, the instrument approach must be discontinued.
- MAP is the last point at which the published missed approach can be safely executed in instrument conditions.

2) The following is a list of statements which describe what MAP is not.

- MAP is not always the last point at which a pilot can decide to continue the approach by external visual references. Often, the MAP is located at a point where a pilot cannot safely descend and land if the MDA is maintained until arriving at the MAP (e.g., when the MAP is located over the VOR on the airport).
- MAP is not a point where a decision or commitment to land is made.
- MAP is not a point where the decision process begins.
- MAP is not a point where all aspects of the decision are instantaneously formulated.

4-161 MINIMUM INSTRUMENT FLIGHT ALTITUDES. Except for certain CAT III operations, all instrument approach and landing operations have limitations related to obstacles, airborne instrumentation and equipment, ground-based navigation equipment, and/or visual aids. Because of these limitations, external visual information is required to safely complete instrument approaches and landings. Airborne instruments and equipment and the signals in space radiated by ground-based NAVAIDs must provide pilots adequate guidance to safely control an aircraft by reference solely to instruments until the aircraft arrives at a preestablished minimum height or altitude (DA/DH or MDA) for instrument flight. The total system (airborne and ground-based) does not provide this capability below the minimum height or altitude for instrument flight. Therefore, descent below the specified minimum height or altitude for instrument flight can only be safely accomplished when adequate external visual references are available. If adequate external visual references are not established, a pilot must execute an instrument missed approach at or before passing a preestablished MAP.

NOTE: Descent below the specified minimum IFR altitude without adequate visual references to control and maneuver the aircraft to a landing is unsafe and prohibited. The minimum height or altitude for instrument flight for an instrument approach and landing is specified in various ways depending on the type and category of the instrument approach conducted.

A. NPA Procedures. The minimum heights or altitudes for IAPs that do not have vertical guidance can be specified as an MDA, height above touchdown (HAT), height above airport (HAA), minimum descent height (MDH), Obstacle Clearance Altitude (OCA), Obstacle Clearance Height (OCH), or Obstacle Clearance Limit (OCL). MDA, HAT, HATh, and HAA are used by the United States and certain foreign countries that use TERPS criteria. OCA, OCH, and OCL are used in most foreign countries and are established in accordance with

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ICAO PANS-OPS. Although the current edition of ICAO PANS-OPS eliminated use of OCL, some countries still use OCL criteria from previous editions of PANS-OPS. Some countries, in addition to OCA and OCH, provide MDA and MDH. MDA and OCA are barometric flight altitudes referenced to mean sea level (MSL). HAT, HATh, HAA, MDH, OCH, and OCL are radio or radar altitudes referenced to either the elevation of the airport, the elevation of the TDZ, or the elevation of the landing threshold.

- MDA or OCA may be specified for any approach procedure that does not have vertical guidance.
- HAT, MDH, OCH, or OCL may be specified for straight-in approach procedures that do not have vertical guidance.
- HAA, MDH, OCH, or OCL may be specified for circling maneuvers.

B. Precision Approach Procedures and Approach Procedures with Vertical Guidance (APV). The minimum heights or altitudes for IAP with vertical guidance can be specified as a DA, OCA, DH, OCH, or OCL. In the United States and certain foreign countries that use U.S. TERPS criteria, the minimum instrument flight altitude for precision with vertical guidance and APV is DA/DH. DA/DH is specified as a DA referenced to MSL for aircraft equipped with only barometric altimeters and as HAT or HATh (for procedures developed with harmonized visibility minimums) for aircraft equipped with radio altimeter or RAs. DA, DH, OCH, and OCL are used in most foreign countries and are established in accordance with various versions of ICAO PANS-OPS. DA and OCA are referenced to a barometric altitude (MSL). DH (in most countries), OCH, and OCL are referenced to a radio or radar height above either the elevation of the airport, the elevation of the TDZ, or the elevation of the landing threshold.

C. Lowest Permissible Height or Altitude for Instrument Flight. The lowest permissible height or altitude for instrument flight for any approach cannot be lower than any of the following:

- Minimum height specified by the FAA-approved Aircraft Flight Manual (AFM).
- Minimum height or altitude for which the signals from ground-based or space-based navigation equipment can be relied upon for instrument flight.
- Minimum height or altitude that provides adequate obstacle clearance.
- Minimum height or altitude authorized for the flightcrew.
- Minimum height or altitude authorized for the operator for that aircraft and equipment combination.
- Minimum height or altitude permitted by the operative airborne and ground-based or space-based equipment.
- Minimum height or altitude published or otherwise established for the instrument approach.
- Minimum height or altitude authorized in OpSpecs for the operation being conducted.

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4-162 OPERATING MINIMUMS. The lowest operating minimums for operations conducted under 14 CFR parts 91K, 121, 125, and 135 are specified in standard OpSpecs, MSpecs, and LOAs as appropriate. In general, an air carrier is authorized to use operating minimums specified by the following groups of IAP, provided the minimums are not lower than the lowest minimums specified in the air carrier's OpSpec for any particular type of approach procedure.

- Part 97, IAP.
- U.S. military IAPs at U.S. military airports.
- Any IAPs approved and incorporated into the OpSpecs.
- ICAO contracting State IAPs at foreign airports.
- IAPs established by an air carrier at foreign airports, provided the procedure is accepted in accordance with the OpSpecs.

A. Straight-In Minimums for Approaches with a DA/DH. The lowest permissible DA/DH and visibility minimums for all airplanes conducting standard straight-in IAPs other than CAT II or CAT III that have a DA/DH are HAT 200 and RVR 1800. The lowest permissible DA/DH and visibility minimums for helicopters is ¼-sm visibility or RVR 1200. These basic DA/DH and visibility minimums are normally restricted to runways that are equipped with a lighting system consisting of TDZ and RCL lights and medium intensity approach lighting system with runway alignment indicator lights (MALSR), simplified short approach lighting system with runway alignment indicator lights (SSALR), and ALSF-1 or ALSF-2 approach lighting systems. RVR 1800 is authorized when FD, autopilot, or HUD is used in lieu of TDZ and RCL lights. Additionally, SA CAT I operations are discussed in Volume 4, Chapter 2, Section 6.

B. Straight-In Minimums for Approaches with an MDA. The lowest permissible MDA and visibility minimums for Categories A, B, C, and D aircraft during the conduct of straight-in IAPs that have an MDA are HAT 250 and ½-sm visibility or RVR 2400. The lowest permissible MDA and visibility minimums for helicopters operated at 90 knots or less are HAT 250 and ¼-sm visibility or RVR 1600. The lowest MDA and visibility minimums for helicopters operated at more than 90 knots are HAT 250 and ½-sm visibility or RVR 2400. These minimums are the lowest authorized for approaches that have an MDA and are restricted to runways that are equipped with MALSR, SSALR, ALSF-1, or ALSF-2 approach lighting systems, or foreign equivalents.

C. Controlling Minimum Concept. The concept of a controlling minimum is based on reported weather conditions at the destination airport. The controlling minimum concept includes considerations for the reported weather conditions, the capabilities of the flightcrew, and the capabilities of the airborne and ground- or space-based equipment. This concept prohibits a pilot from continuing past the FAF or beginning the Final Approach Segment (FAS) of an IAP unless the reported visibility (RVV or RVR, if applicable) is equal to or greater than the authorized visibility (RVV or RVR) minimum for that IAP.

1) Objective. The basic objective of the controlling minimum concept is to provide reasonable assurance that once the aircraft begins the FAS, the pilot will be able to safely complete the landing. The controlling minimum concept, however, permits a pilot to continue a

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CAT I approach to DA/DH if the visibility/RVV/RVR was reported to be at or above the controlling minimum when the pilot began the FAS, even though a later visibility/RVV/RVR report indicates a below-minimum condition. RVR reports, when available for a particular runway, are the reports (controlling reports) that must be used for controlling whether an approach to, and landing on, that runway is authorized or prohibited.

2) Parts 91 and 91K Controlling Minimum. The controlling minimums concept as described above is not applicable to part 91 or 91K operators when determining if the pilot can continue past the FAF or begin the FAS. Parts 91 and 91K operations can begin an approach and continue to the DA/DH or the MDA and the MAP, even when the weather conditions are reported to be below the authorized IFR landing minimums. Upon arrival at the MDA and before passing the MAP, or upon arrival at the DA/DH, the approach may be continued below DA/DH or MDA to the runway if the seeing-conditions required by § 91.175(c)(d) or § 91.175(1) are met.

3) Part 121 Controlling Minimum. The controlling minimum concept for operations conducted under part 121 is implemented by § 121.651(b). For these operations, the controlling minimum must be used at civilian airports within the United States and its territories, and at U.S. military airports, unless the provisions of § 121.651(d) are met. Section 121.651(d) permits a pilot to begin the FAS, even though the reported visibility/RVV/RVR is below the controlling minimum, if the approach procedure is an ILS and the flight is actively monitored by a PAR.

a) Therefore, pilots are not constrained by the controlling minimum on runways with ILS and active PAR facilities, provided the provisions of § 121.651(d) are met. The controlling minimum concept allows for a pilot to continue a CAT I approach to DA/DH or MDA if the visibility/RVV/RVR was reported to be at or above the controlling minimum when the pilot began the FAS, even though a later visibility RVV/RVR report indicates a below-minimum condition.

b) Upon reaching DA/DH or MDA and before passing the MAP, the approach may be continued below DA/DH or MDA to touchdown if the requirements of § 121.651(c) are met, even though the visibility/RVV/RVR is reported to be below the controlling minimum. The controlling minimum concept does not apply to part 121 operations conducted at civilian airports in many foreign countries. In foreign countries, part 121 operators may conduct look-see approaches unless the rules of a foreign country (such as the United Kingdom) prohibit look-see approaches. If the rules of the foreign country prohibit look-see approaches, the controlling minimum concept applies in that country.

4) Parts 125 and 135 Controlling Minimum. The controlling minimum concept for parts 125 and 135 differs in application from part 121. Part 91 applies to all parts 125 and 135 operations whether they are conducted in foreign countries or the United States (see part 125, § 125.23(b) and § 135.3(b)). Operations conducted under parts 125 and 135 must also be in compliance with §§ 125.381 and 135.225 (which applies to all operations within the United States, its territories, U.S. military airports, and foreign airports). For parts 125 and 135 operations, the controlling minimum concept must be used at all airports (with the exception of a

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part 135 “eligible on-demand” operator who is permitted to start an approach without weather reported above landing minimums (see § 135.225(b)).

a) As a consequence, §§ 125.381(b) and 135.225(b) prohibit part 125 and 135 operators from conducting look-see approaches at any airport. The controlling minimum concept, however, allows for a pilot to continue a CAT I approach to DA/DH or MDA if the visibility/RVV/RVR was reported to be at or above the controlling minimum when the pilot began the FAS, even though a later visibility/RVV/RVR report indicates a below-minimum condition.

b) The controlling minimum concept also allows for a pilot (upon reaching DA/DH or MDA and before passing the MAP) to continue the approach below DA/DH or MDA and to touchdown, if the requirements of § 91.175 are met, even though the visibility/RVR is reported to be below the controlling minimum.

4-163 MAXIMUM SINK RATES.

A. Perceptual Limitations. Restricted seeing-conditions significantly affect a pilot’s ability to visually detect or perceive vertical height, sink rate (vertical velocity), and vertical acceleration. As seeing-conditions decrease, the pilot’s ability to perceive vertical height, sink rate, and vertical acceleration degrades faster than the ability to perceive lateral errors and lateral accelerations. Personnel establishing operating minimums must consider these human perceptual limitations.

B. Aircraft Structural Limitations. According to structural design criteria, the aircraft structure must tolerate touchdown sink rates (vertical velocity) of at least 10 feet per second (600 fpm). Touchdown sink rates higher than the maximum rates evaluated during the certification of an aircraft can cause serious structural damage, including catastrophic failure. Therefore, instrument procedure design must provide for sink rates that give a pilot the capability of detecting unacceptable situations and adjusting the flightpath to achieve a safe landing, considering available visual aids and operating minimums. Visual aids and operating minimums must provide a high probability that a pilot will be able to control the aircraft adequately and adjust the vertical flightpath to achieve acceptable sink rates at touchdown and touchdown within the TDZ.

C. Maximum Acceptable Sink Rates. Operational experience and research have shown that a sink rate of greater than approximately 1,000 fpm (16.67 feet per second) is unacceptable during the final stages of an approach (below 1,000 feet above ground level (AGL)). This is due to a human perceptual limitation that is independent of the type of airplane operated and is equally applicable to helicopters. Therefore, the IAPs and the operational practices and techniques must ensure that sink rates greater than 1,000 fpm are not required or permitted in either the instrument or visual portions of an approach and landing operation. Operating minimums and available visual aids must provide reasonable assurance that a pilot will have adequate external visual references in the visual portions of all IFP (certain CAT III operations excepted). To be considered adequate, these external visual references must permit a pilot to adequately perceive sink rates and manually maneuver the aircraft (or evaluate autopilot

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performance) to achieve an acceptable touchdown sink rate and touchdown point, considering the operating minimums and the available visual aids.

4-164 EFFECTS OF AIRCRAFT/COCKPIT DESIGN ON SEEING-CONDITIONS.

A. Design of an Aircraft. The overall design of an aircraft and the design of a cockpit significantly affect seeing-conditions during the latter stage of an approach and landing and during the initial stage of a takeoff. Cockpit design has a direct effect on a pilot's ability to determine the 3-D position of an aircraft in relation to a landing or takeoff surface and, consequently, on the ability to safely control the flightpath of the aircraft. Therefore, cockpit design is a significant factor in establishing operating minimums of a particular aircraft. Generally, aircraft with larger cockpit cutoff angles (better downward viewing angles over the nose) and shallower landing pitch attitudes provide for better seeing-conditions. Improved seeing-conditions derived from improved cockpit design can be used to justify lower operating minimums. Seeing-conditions are affected by geometric factors related to the design of an aircraft's structure and by aerodynamic factors related to an aircraft's pitch axis. When considering aircraft/cockpit design, it is important to note the following:

- The radio (radar) altimeter is calibrated to read the height of the landing gear above the terrain (when in the landing configuration).
- The glidepath antenna tracks down the centerline (CL) of the GS when the instruments in the cockpit indicate the aircraft is on glidepath.
- The pilot's eyes are always higher than what is indicated on the radio (radar) altimeter.
- The pilot's eyes are above the electronic GS in most aircraft.

B. Aircraft and Cockpit Physical Design. The significant factors related to the physical design of an aircraft and cockpit combination that affect seeing-conditions most are as follows:

- Distance along the longitudinal axis from directly above the main landing gear to directly beneath the pilot's eyes.
- Vertical distance from the pilot's eyes to a position abeam the main landing gear.
- Distance along the longitudinal axis from directly beneath the GS antenna to directly beneath the pilot's eyes.
- Vertical distance from the GS antenna to abeam the pilot's eyes.
- Cockpit-Cutoff (CCO) angle.

C. The CCO Angle. The CCO angle is the angle, measured downward, from the longitudinal axis of the aircraft (zero pitch reference) to the lowest (most depressed) angle that can be seen over the aircraft's nose from the proper sitting position (eye reference position). The CCO angle in most transport category aircraft is between 15 and 25 degrees. Although many VFR helicopters have an excellent CCO angle, most IFR helicopters have CCO angles equivalent to transport category aircraft.

D. Aircraft Aerodynamic Design. The significant factors associated with the aerodynamic design of an aircraft that affect seeing-conditions are related to pitch attitudes. The pitch attitudes necessary for final approach, flare (deceleration for rotorcraft), and landing

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(air taxiing for rotorcraft) have a major effect on seeing-conditions. This is because a nose-up attitude reduces the downward viewing angle relative to the horizon, which reduces seeing-conditions.

1) For example, an aircraft with an excellent CCO angle of 21 degrees and a high final approach pitch attitude of 8 degrees would have a seeing condition comparable to a similar size aircraft having a poor CCO angle of 13 degrees and a 0 degree pitch attitude. Since the pitch attitude on final approach varies with approach speed, aircraft configuration, and gross weight, the seeing-conditions change as these operational factors change.

2) The aircraft's flare characteristics (deceleration for rotorcraft) can also have a significant effect on the seeing-conditions during landing. The seeing-conditions during flare decrease if any positive pitch change is required. In helicopters, the most severe degradation to the seeing-conditions occurs during deceleration to air taxi or hover. Often, the deceleration rate in a helicopter must be limited to maintain adequate seeing-conditions.

3) For example, when a typical IFR helicopter with an 18 degree CCO angle and a 0 degree final approach attitude approaches an 18 degree pitch attitude during a maximum effort deceleration, the pilot will lose sight of the landing surface. At an 18 degree pitch attitude with an 18 degree CCO angle, the lowest downward viewing angle would be parallel with the horizon.

4) Therefore, a deceleration pitch attitude must be maintained significantly below 18 degrees to maintain adequate visual references with the landing surface. A similar situation is encountered in turbojet airplanes during takeoff rotation and initial climb when external visual references can be lost.

E. Eye Reference Position. Eye reference position is a critical factor in achieving optimum seeing-conditions. A pilot's seat must be individually adjusted so that the pilot's eyes are located at an optimum eye reference position. When seated in this position, a pilot should be able to take advantage of the full CCO angle, maintain reference with the necessary flight instruments, and operate all necessary controls. Many aircraft have special devices that indicate proper seat adjustment. Improper seat adjustment, especially in CAT II and III operations, can prevent the pilot from acquiring adequate external visual reference upon arrival at DA/DH or MDA/MAP.

1) The seating position commonly used for en route operations in many aircraft is too low and too far aft for the pilot to achieve optimum seeing-conditions during approach and landing operations. This lower and further aft seating position results in a reduction of the CCO angle, which degrades the seeing-conditions by reducing the segment of the approach and landing surface visible over the aircraft's nose.

2) A pilot maintaining this undesirable seating position during approach and landing may tend to compensate for the reduced CCO angle, and its effects, by leaning forward in an attempt to acquire the necessary external visual references. A consequence of this practice is a tendency to unintentionally reduce the pitch attitude. Since seeing-conditions improve as the

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nose is lowered, this tendency to reduce pitch attitude can contribute to the tendency to duck under, which has resulted in landings short of the runway.

4-165 SAFETY DURING MISSED APPROACHES AND GO-AROUNDS.

A. Executing a Go-Around. Most aircraft used in air transportation have the capability, in a normal approach and landing configuration, of safely executing a go-around from any point before touchdown, even when significant failures occur, such as engine, hydraulic, or autopilot failures. This aircraft performance capability for safety in go-arounds should be provided for, particularly for go-arounds caused by operational factors, such as airborne and ground-based equipment failures, ATC contingencies, loss of external visual references, and misalignment with the landing surface. This capability is required in all CAT II and CAT III operations. When establishing operating minimums for aircraft that do not have this capability, the consequences of the failures that would preclude a safe go-around must be considered. Operating minimums for aircraft without the performance capability to safely go around following engine failure must provide adequate seeing-conditions to successfully accomplish a forced landing in a preestablished location. The following factors must be considered when evaluating the safety of go-arounds from any point in the approach before touchdown.

B. Go-Around Capability. The go-around capability is based on normal operating conditions at the lowest authorized operating minimum. Factors related to geometric limitations of the aircraft during the transition to a go-around (such as tail strike, or rotor strike) must be considered. Other factors such as the available visual cues, autopilot or FD mode switching, altitude loss in transition to go-around, and altitude loss due to autopilot malfunction must also be considered.

C. Inadvertent Touchdown. If a go-around could result in an inadvertent touchdown, the safety of such an event must be considered. The aircraft design and/or procedures used must accommodate for relevant factors. Examples of relevant factors that must be considered include operation of engines, the operation of autothrottle, autobrakes, autospoilers, autopilot mode switching, and other systems that could be adversely affected by an inadvertent touchdown.

D. Failure Condition in the Aircraft. If the occurrence of any failure condition in the aircraft or its associated equipment could preclude a safe go-around from low altitude, then these failure conditions must be clearly identified. In these cases, a minimum height must be specified from which a safe go-around can be initiated if the failure occurs. If the failure occurs below the specified height, pilots must be made aware of the effects or consequences of any attempt to go around.

E. Appropriate Procedures for Low-Altitude Go-Arounds. Information must be provided to the flightcrew concerning appropriate procedures for low altitude go-arounds and the height loss expected. If the conduct of certain approach and landing operations is authorized with an engine-out, height loss information for engine-out operations must also be provided to the flightcrew.

4-166 FUNCTION OF EXTERNAL VISUAL REFERENCES. Except for certain CAT III operations, external visual information is essential for a pilot to safely take off or to complete an

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instrument approach and landing. This external visual information (visual cues) is necessary for a pilot when assessing the 3-D position of the aircraft, its velocity, and its acceleration or deceleration in relation to the intended landing or takeoff surface. This information is essential for a pilot when manually maneuvering (or when evaluating the autopilot's performance in maneuvering) the aircraft into alignment with the centerline of a landing or takeoff surface. External visual references are essential for a pilot to safely touchdown (decelerate to air taxi/hover for rotorcraft) within the TDZ and for maintaining directional control to stop on the runway (maintain directional control and avoid obstacles while air taxiing for rotorcraft). In degraded seeing-conditions, the quality of external visual information can be significantly improved by use of visual aids, such as runway markings and lighting. Such visual aids are necessary to increase the conspicuousness of the landing or takeoff surface. These aids provide pilots with the necessary visual references during takeoff, the final stages of approach and landing, and ground movement. The importance of visual aids increases as seeing-conditions decrease.

A. Lateral Position and Crosstrack Velocity or Acceleration. Approach lighting, TDZ lighting, RCL lighting, runway edge lighting, and runway markings provide visual references to pilots for assessing lateral position and crosstrack velocity or acceleration.

B. Visual Roll References During Landing, Takeoff, Rotation, and Initial Climb. Approach lighting, threshold lighting, in-runway lighting, and runway markings provide visual roll references during landing, takeoff, rotation, and initial climb.

C. Visual Information for a Pilot. TDZ lighting and runway markings indicate the plane of a landing surface and identify the touchdown area, thereby providing a vertical and longitudinal reference. These visual aids provide necessary visual information for a pilot to determine vertical position, sink rate, and vertical acceleration or deceleration.

D. Adequate Alignment and Directional Control Information. The visual guidance information from in-runway lights and/or markings must be sufficient to ensure adequate alignment and directional control information during takeoff or during final stages of landing and deceleration.

E. External Visual Aids. Reference to external visual aids is a primary requirement for controlling the aircraft's flightpath when operating below the minimum altitude (height) published for instrument flight.

4-167 MINIMUM VISIBILITY, RVV, AND/OR RVR. Upon arrival at the minimum height or altitude for instrument flight and before passing a preestablished decision point, a pilot must establish adequate seeing-conditions to safely complete the approach and landing.

A. Establishing Operating Minimums. Operating minimums are expressed as visibility, RVV, or RVR. Criteria for establishing operating minimums must provide a reasonable assurance that a pilot can establish the required seeing-conditions before passing the decision point. This criterion provides this assurance if the weather conditions are reported to be at or above the landing minimum when the approach is initiated. To achieve this objective, the operating minimums specified for the procedure (visibility, RVV, RVR) must be compatible

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with the minimum height or altitude for instrument flight and the decision point specified for the procedure.

B. Establishing Visual Reference. Therefore, when the reported weather conditions are at the authorized minimums, a pilot should be able to establish external visual references upon arrival at the minimum height or altitude (DA/DH or MDA), and before passing the decision point (DA/DH, MAP, or visual descent point (VDP)). At this point a pilot must be able, by external visual reference, to maneuver to a landing without exceeding a descent rate of 1,000 fpm or exceeding aircraft limitations on touchdown. For example, it would not be practical to specify a DA/DH of 200 feet (HAT 200) with an operating minimum of RVR 700 since the first visual contact in a typical aircraft would not occur until approximately 130 feet above the elevation of the TDZ.

C. Adequate External Visual References. The specified operating minimum must also permit adequate external visual references to be established early enough for a normal descent to landing (less than 1,000 fpm). For example, it would not be reasonable to specify an MDA equivalent to a HAT of 400 feet and an operating minimum of RVR 1600 for typical turbojet airplanes. In this situation, the pilot would not establish first visual contact until the airplane is within 4,000 feet of the landing threshold and would require a descent rate much higher than 1,000 fpm to land within the TDZ.

4-168 CONCEPT OF RVR.

A. Operating Minimums. Operating minimums are specified in terms of ground visibility, tower visibility, and RVR. The RVR concept has evolved over a long period, and its use in the United States began in 1955. As operating minimums were reduced due to improvements in airborne and ground-based equipment, it became more likely that pilots would not see the full length of the runway upon arrival at the specified decision point. Positions established for taking visibility observations were often several miles from the approach end of many runways. This resulted in reported visibility values that frequently did not represent the seeing-conditions encountered during the final stages of approach and landing. This deficiency was particularly critical when rapidly changing weather conditions within the terminal area occurred. These factors generated a need for systems such as RVR, which could rapidly and reliably provide reports of the seeing-conditions that a pilot could expect to encounter in the TDZ and along the runway.

B. RVR Measurements. RVR measurements are taken by a system of calibrated transmissometers and account for the effects of ambient background light and the runway light intensity. Transmissometer systems are strategically located to provide RVR measurement associated with one or more of the three basic portions of a runway: the TDZ, the runway midpoint (Mid), and the rollout end of the runway (rollout).

C. Instrumentally Derived Value. RVR is an instrumentally derived value that reflects an artificially created seeing-condition on or near the portion of the runway associated with the RVR report. This artificially created seeing-condition is achieved by using HIRLs, as well as TDZ and RCL lights if they are installed. These lights increase the conspicuousness of the landing surface and reach out to the pilot, thereby creating a seeing-condition that is significantly

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better than the reported ground visibility or tower visibility. Since RVR is based on high intensity lights, an RVR report only has meaning when associated with the seeing-conditions on or near the portion of the runway where the report was obtained (TDZ, Mid, or rollout). An RVR report has no meaning unless a pilot is also seeing the high intensity lights on which the report is based.

1) To properly apply operating minimums, it is important to understand RVR. The following is a list of statements that describe what RVR is.

- RVR is an instrumentally derived value.
- RVR is currently measured by transmissometers located approximately 400 feet from RCL.
- RVR is related to the transmissivity (degree of opaqueness) of the atmosphere.
- RVR is an approximation of the distance a pilot should see when an aircraft is on, or slightly above, the portion of the runway associated with the report.
- RVR is calibrated by reference to runway lights and/or the contrast of objects.
- RVR is a value that varies with runway light setting.
- RVR is a value that only has meaning for the portions of the runway associated with the RVR report (TDZ, Mid, or rollout).

2) The following is a list of statements that describe what RVR is not.

- RVR is not a measure of meteorological visibility.
- RVR is not a measure of surface visibility or tower visibility.
- RVR is not a measure of seeing-conditions on taxiways, ramps, or aprons.
- RVR is not a measure of seeing-conditions at or near MDA or DA/DH.
- In the United States, RVR is not measured or reported by a human observer.
- RVR is not “visibility.”

D. Concept of Controlling RVR. Controlling RVR means that RVR reports are used to determine operating minimums whenever operating minimums are specified in terms of RVR, and RVR reports are available for the runway being used. All CAT I operating minimums below ½ sm and all CAT II and III operating minimums are based on RVR. The use of visibility is prohibited because the reported visibility may not represent the seeing-conditions on the runway. All takeoff minimums below ¼-sm visibility (RVR 1600 for airplanes and RVR 1200 for rotorcraft) are predicated on RVR and use of visibility is prohibited. For example, if the takeoff minimum for a particular operation is TDZ RVR 1200/rollout RVR 1000, RVR reports are controlling and a takeoff is prohibited unless the TDZ RVR report is at or above RVR 1200 and the rollout RVR report is at or above RVR 1000. In this example, a takeoff cannot be based on visibility if the RVR system is operative, even if the reported visibility is greater than 1 sm.

4-169 VISUAL AIDS AND RUNWAY ENVIRONMENT.

A. Identifying Contrast Levels. A primary factor in the identification of objects, such as landing surfaces, depends on a pilot’s ability to see contrasts between the object and the surrounding background. The ability to see and recognize contrasts in the brightness or color of an object is much greater than the ability to determine the actual level of illumination of an

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object. For example, a 100-watt light bulb seems to be much brighter at night than during daylight conditions, even though the actual level of illumination is the same.

B. Increasing Contrast Levels. The contrast between a 100-watt light and a dark night background is much greater than it is in a daylight background. The presence of airborne particles or water droplets causes the available light to diffuse or scatter. This scattering effect raises the overall illumination of the background that, in turn, reduces the level of contrast between an object and its background. This is the primary reason why seeing-conditions decrease when landing into the sun on a hazy or foggy day or when the landing lights of an aircraft are turned on in snow or fog conditions. Reduced levels of contrast increase the difficulty of identifying objects such as snow-covered runways or runways located in heavily lighted urban areas. As a result, contrast levels must be increased to provide the seeing-conditions necessary for the safe conduct of operations with reduced operating minimums.

1) Seeing-conditions can be improved by using visual aids and by enhancing the level of contrast within the runway environment. For example, the difference in the level of contrast between a landing or takeoff surface and the surrounding area can be improved through good airport maintenance practices. Such practices as planting and maintaining grass around a runway and between a runway and a taxiway, and plowing snow-covered runways, improve levels of contrast. The most effective way to improve the contrast of a landing or takeoff surface, however, is to use visual aids because they are effective in a variety of weather conditions.

2) Visual aids such as approach lights, runway lights, and runway markings significantly improve the contrast between a landing or takeoff surface and the immediate surrounding area. The improved contrast provided by approach and runway lighting significantly improves seeing-conditions in both night and daylight operations. Approach lighting and runway lighting are essential elements of all landing operations conducted in weather conditions below RVR 4000 and all takeoff operations below RVR 1600.

4-170 THRESHOLD CROSSING HEIGHT (TCH) CONCEPT. Many complex technical factors must be considered during the installation of ILS equipment to support approach and landing operations at any particular runway. The signals in space radiated by the facility must meet required flight inspection requirements (accuracy and course structure) for the particular category of operation to be supported. Design of ground support systems must be such that there is an extremely small probability of losing electronic guidance during actual operations (continuity of service). The design must also provide for an extremely high probability of providing continuously reliable electronic guidance (integrity). The ILS accuracy and course structure, continuity of service, and integrity must meet established standards for the category of operation authorized at that facility. Another critical factor in installing and siting these systems is the TCH. The following discussion addresses significant factors that must be considered when establishing acceptable TCHs.

A. Aircraft GS/Elevation Antenna Location. The GS/elevation receiver of the aircraft detects vertical movement (displacement) of the GS/elevation antenna in relation to the centerline of an electronic GS/elevation radiated from a ground facility. As a result, the location of the GS/elevation antenna on the aircraft directly relates to terrain and obstacle clearance during the final stages of an approach and landing.

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1) The physical dimensions and aerodynamic characteristics of the aircraft (especially pitch attitude) are important factors in the determination of the proper location of a GS reception antenna. In conventional aircraft, the GS/elevation antenna is located above the height of the main landing gear. Since an aircraft is maneuvered so that its antenna tracks the centerline of the electronic glidepath, the main landing gear will track below the glidepath.

2) For example, if the antenna of an aircraft is located 40 feet above the landing gear and the electronic glidepath crosses 30 feet above the runway threshold, the main landing gear will touch down short of the runway since the antenna, not the landing gear, flies the glidepath. This example illustrates the important relationship between the aircraft antenna location and the electronic glidepath TCH.

3) This situation can be resolved by siting the ILS to achieve a specified TCH and by requiring proper location of the GS/elevation antenna on the aircraft. Similar problems are encountered when using visual vertical guidance systems such as Visual Approach Slope Indicator (VASI) or precision approach path indicator (PAPI), since the pilot's eyes track the visual glidepath and the gear follows a lower path. The need to maintain certain landing gear crossing heights at the threshold establishes the minimum safe TCH for a particular aircraft. The current minimum TCH requirements are based on the DC-10 that has, in landing configuration, the greatest vertical displacement between the antenna location and the landing gear.

B. Barometric VNAV (baro-VNAV) TCHs. The most significant factor in determining the threshold wheel crossing height for aircraft using baro-VNAV for vertical guidance during the FAS is the vertical distance between the static ports and the bottom of the main landing gear when the aircraft is in its normal approach attitude. The minimum and maximum acceptable TCHs for these aircraft are determined in a manner similar to ILS-equipped aircraft using the static ports and the main landing gear height, instead of the GS/elevation antenna to landing gear height.

C. Acceptable TCHs. Siting ILS equipment to achieve a particular TCH can be a complex task. Operational experience with siting these systems has shown a need to establish a range of acceptable TCHs. The types of aircraft likely to use a particular facility must be considered. Another consideration in establishing the range of acceptable TCHs is the pilot's ability to detect (by external visual references) deviations from the proper glidepath and to make the necessary flightpath adjustments for adequate landing gear clearance at the threshold. Proper TCHs in CAT II and especially CAT III operations are more critical because of the limited visual cues available and the use of automatic landing systems.

D. Minimum and Maximum Acceptable TCHs in the United States. The minimum acceptable TCH at a particular runway is determined by the most TCH-critical aircraft likely to be used at that facility. The maximum acceptable TCH also depends upon the types of aircraft likely to be used at the facility. The instrument approach and landing system must be sited so that all aircraft have a high probability of a safe touchdown (deceleration to air taxi or hover for rotorcraft) in the TDZ. Landing performance is based on the assumption that touchdown will occur in the TDZ. Very high TCHs will not permit some aircraft to safely touchdown within the TDZ, therefore maximum acceptable TCHs must also be established.

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E. TCHs at Foreign Airports. GS TCHs at foreign airports may not be equivalent to U.S. criteria. It is important for pilots and operators using foreign airports to understand the significance of TCH and to know the minimum TCHs that can be safely used by their aircraft. Operations should not be conducted to runways with TCHs below minimum acceptable TCHs for any particular aircraft, unless special limitations are placed on the conduct of the operation. These special limitations must be such that a pilot can safely and consistently touchdown within the TDZ and safely complete the rollout on the available runway length.

4-171 AIRPORT FACILITIES AND SERVICES. The varied seeing-conditions encountered in AWTAs require pilots to rely heavily on visual aids, electronic guidance from ground-based facilities, and other facilities and services provided by the airport. Therefore, basic VFR airport facilities and services must be enhanced before safe operations can be conducted in instrument flight conditions. Runways and taxiways must meet more stringent criteria with respect to width, length, marking, and lighting. Instrument approach aids and IAPs are required. Visual aids are needed to assist a flightcrew during transition from instrument to visual flight and during ground movement. Meteorological observation and measurement equipment must be available to provide real-time information on weather conditions. Equipment and procedures must be established to provide aeronautical information on runway surface conditions and the status of airport facilities and services.

A. VFR Airport Facilities and Services. Enhancements to basic VFR airport facilities and services necessary to support instrument flight operations include the following general factors:

- Physical characteristics of the runway environment, including approach, departure, and pre-threshold terrain characteristics.
- Obstacles and the obstacle limitation assessment surfaces.
- Visual aids.
- Electronic aids.
- Secondary (standby) power supplies.

B. Physical Characteristics. Physical characteristics of a runway environment become increasingly important as seeing-conditions deteriorate. Excessive runway or approach light gradients can create undesirable visual illusions and can cause hard or long landings. Longer runway lengths are necessary for reasons such as the tendency to land further down the runway because of visual illusions and the increased difficulty in controlling the aircraft's flightpath. The topography in the approach and pre-threshold areas should be regular and preferably level to ensure proper operation of radio (radar) altimeters, FD systems, and automatic landing systems.

1) The operation of automatic landing systems and other systems that provide flight guidance during flare and landing (such as HUD) is dependent on input from RAs. As a result, the flare profile, touchdown sink rate, and touchdown point can be adversely affected by the profile of the pre-threshold terrain. Where the pre-threshold terrain for a particular runway could affect safe operations (e.g., Seattle-Tacoma International Airport (SEA) 16R, Cincinnati/Northern Kentucky International Airport (CVG) 36C, Minneapolis-St. Paul International/Wold-Chamberlain Airport (MSP) 30L, and Pittsburgh International Airport

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(PIT) 10L), an in-flight demonstration must be made to determine that the flight control system of a particular aircraft is not adversely affected by the pre-threshold terrain profile.

2) Additionally, the pre-threshold terrain at certain runways (e.g., MSP 30L and PIT 10L) may not permit an RA to be used to define DH for CAT II or AH/DH for CAT III operations for certain aircraft. In certain situations, an inner marker (IM) can be used to define the CAT II DH or the CAT III AH.

C. Obstacles and Obstacle Limitation Assessment Surfaces. Degraded seeing-conditions decrease a pilot's ability to see and avoid obstacles. Therefore, it is essential that obstacle protection is provided along the approach paths, missed approach and departure flightpaths, and in areas on or near runways used for takeoffs and landings. Obstacle protection criteria for different categories of operations and the various phases of an approach, landing, missed approach, takeoff, and departure are specified in U.S. TERPS, ICAO PANS-OPS, and applicable ACs.

1) In certain situations, obstacles may prevent the conduct of CAT II or III operations. In other situations, a higher-than-normal DH for CAT I or II operations may be required to guarantee obstacle clearance upon the execution of a missed approach. During operations using approaches with vertical guidance, it is essential to provide obstacle protection in Runway Safety Areas (RSA) and obstacle-free zones. An RSA is an area adjacent to the runway that must be free from fixed or mobile "nonbreakable" obstructions. RSAs reduce the potential for catastrophic accidents if portions of the aircraft structure (such as a wingtip) extend beyond the runway edge, or if an aircraft departs the runway during a landing or takeoff roll.

2) An obstacle-free zone is a 3-D area including portions of the landing surface that provides obstacle clearance during landings or during rejected landings, including missed approaches after touchdown. The only fixed obstructions permitted in RSAs or obstacle-free zones are frangible objects or obstructions that are fixed by their functional purpose. "Fixed by their functional purpose" means that the installation of the object in those areas is essential to the safe conduct of operations on the runway; there are no alternative locations (examples include such objects as runway lights, GS/elevation antennas, and RVR reporting systems). Mobile obstructions (such as aircraft and/or vehicles) are not permitted within RSAs or obstacle-free zones while aircraft are using the runway. Aircraft, vehicles, and other objects that could disturb ILS electronic guidance are not permitted in ILS critical areas when other aircraft are critically dependent on this type of guidance.

3) Since protection of these areas or zones is critical to safe operations (particularly during degraded seeing-conditions), visual aids (such as signs, markings, or lighting) must be provided for identifying the boundaries of these areas to pilots and operators of other vehicular traffic. ATC procedures and ground movement restrictions must be provided to ensure that these areas are protected.

D. Visual Aids. Visual aids are essential for most AWTAs. Visual aids are also important for the safe and expeditious guidance and control of taxiing aircraft. These aids include signs, markings, and lights that identify holding points or indicate directions, and the marking or lighting of the taxiway centerline and edges. The conspicuousness of runway and

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taxiway markings deteriorates rapidly, especially at busy airports. These markings must be frequently inspected and maintained, particularly for CAT II or III operations.

1) All lighting systems should be monitored by ATC so that timely information on system failures or malfunctions can be provided to pilots. Regular visual inspections of all sections of the lighting systems are normally used to determine the status of individual lights.

2) Therefore, it is usually only necessary for ATC to remotely monitor lighting circuits to determine whether the proper amount of power is being demanded by, and delivered to, the lighting systems. Remote monitoring of approach, runway edge, and in-runway lighting is essential during CAT II and CAT III operations, unless frequent visual inspections (every 2 hours) or timely pilot reports indicate that the lights are serviceable for the operations in progress.

E. Nonvisual (Electronic) Aids. Ground- or space-based systems that provide electronic guidance must provide the quality of guidance (flight-inspected course structure), integrity (degree of trust that can be placed on the accuracy of the guidance), and continuity of service (protection against loss of signal) appropriate to the category of the operation being conducted (CAT I/CAT II/CAT II). Systems used operations using approaches with vertical guidance must provide acceptable flightpath angles and acceptable TCHs. A classification system has been established through ICAO for ground-based electronic systems used for approaches with vertical guidance.

1) This classification system reflects the ground-based system configuration, course quality, integrity, and continuity of service capabilities. Since the electronic aids provide such a critical function, pilots conducting takeoff or landing operations must be notified immediately of any changes in system status or of any malfunctions or failures. To meet this requirement, all facilities associated with ILS ground equipment must be constantly monitored by ATC or other appropriate personnel.

2) The required levels of reliability, integrity, and continuity of service for these facilities are usually provided by automatic electronic monitoring systems, online standby equipment (backup transmitters), duplication of key functions, and secondary power supplies.

F. Secondary Power Supplies. Secondary power sources (standby power supplies) are essential for ensuring that visual aids, electronic aids, meteorological reporting systems, and communication facilities continue to function, even if the main source of power is interrupted. Loss of power to these systems becomes more critical as seeing-conditions deteriorate. Therefore, as conditions change from CAT I to CAT II or CAT III, the levels of required redundancy increase, and standby power switchover times decrease. Secondary power supply requirements are established in ICAO Annexes 10 and 14, and in various FAA orders and ACs.

RESERVED. Paragraphs 4-172 through 4-186.

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VOLUME 4 AIRCRAFT EQUIPMENT AND OPERATIONAL AUTHORIZATIONS

CHAPTER 2 ALL WEATHER TERMINAL AREA OPERATIONS

Section 4 Low Visibility Surface Movement and Takeoff Operations

4-241 OVERVIEW. This section contains a summary of takeoff operations and describes the standards for the development and approval of a Surface Movement Guidance and Control System (SMGCS) plan for U.S. airports where scheduled air carriers are authorized to conduct operations (taxi, takeoff, and/or landing) when the visibility is less than Runway Visual Range (RVR) 1200. A SMGCS plan facilitates the safe movement of aircraft and vehicles on the airport by establishing more rigorous control procedures and requiring enhanced visual aids.

4-242 APPLICABILITY. Within Flight Standards Service (AFS), each regional Flight Standards division (RFSD) Next Generation (NextGen) Branch (AXX-220) is responsible for the planning, implementation, inspection, and approval of all SMGCS operations. However, inspectors must ensure that each air carrier initial and/or recurrent pilot ground training programs include information about airport surface movement during night and low visibility environments and familiarization with airport markings, signs, and lighting. This is critical for Category (CAT) II/III operations, as well as lower-than-standard takeoff operations.

4-243 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Title 14 of the Code of Federal Regulations (14 CFR) parts 91, 97, 119, 121, 125, 129, 135, and 139.
- Federal Aviation Administration (FAA) Order 1050.1, Environmental Impacts: Policies and Procedures.
- FAA Order 6750.24, Instrument Landing System and Ancillary Electronics Component Configuration and Performance Requirements.
- FAA Order 8400.13, Procedures for the Evaluation and Approval of Facilities for Special Authorization Category Operations and All Category II and III Operations.
- Advisory Circular (AC) 97-1, Runway Visual Range (RVR).
- AC 120-57, Surface Movement Guidance and Control System.
- Technical Standard Orders (TSO).
- U.S. Flight Information Publications (FLIP).

B. Forms. None.

C. Job Aids. None.

4-244 DEFINITIONS.

A. Clearance Bar. A clearance bar consists of three in-pavement, steady-burning yellow lights (see the Aeronautical Information Manual (AIM)).

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B. Gate Designator Markings. Pavement markings used to identify an aircraft parking position/gate(s).

C. Geographic Position Markings. Pavement markings used to identify the location of aircraft or vehicles during low visibility conditions. They are referred to as "spots" by air traffic control (ATC) (see the current edition of AC 150/5340-1, Standards for Airport Markings).

D. Judgmental Over-Steering. When the taxiway centerline does not provide an adequate turn radius, the pilot may intentionally over-steer the aircraft nose wheel to keep the aircraft's main gear within the defined edges of the taxiway.

E. Movement Area. Refers to the runways, taxiways, and other areas of an airport that are used for taxiing, hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and aircraft parking areas (see part 139, § 139.5).

F. Non-Movement Area. Refers to taxiways and apron areas that are not under ATC.

G. Runway Guard Lights—Elevated. Fixture consists of a pair of elevated flashing yellow lights installed on both sides of a taxiway at the runway hold position marking. Their function is to confirm the presence of an active runway and assist in preventing runway incursions (see the AIM).

H. Runway Guard Lights—In-Pavement. Fixture consists of a row of in-pavement, flashing yellow lights installed across the entire taxiway at the runway hold position marking. Their function is to confirm the presence of an active runway and to assist in preventing runway incursions (see the AIM).

I. Stop Bar. Stop bar lights consist of elevated and in-pavement red fixtures that are installed at the runway holding position or instrument landing system (ILS) critical area holding position marking. Stop bars may be controllable by ATC and will include a system of in-pavement, green taxiway centerline/lead-on lights at locations where aircraft will enter or cross a runway.

J. Surface Movement Guidance and Control System (SMGCS). A SMGCS system consists of the provision of guidance to, and control or regulation of, all aircraft, ground vehicles, and personnel on the movement area of an aerodrome. Guidance relates to facilities, information, and advice necessary to enable the pilots of aircraft or the driver of ground vehicles to find their way on the aerodrome and to keep the aircraft or vehicle on the surfaces or within the areas intended for their use. Control or regulation means the measures necessary to prevent collisions and to ensure that the traffic flows smooth and freely (see International Civil Aviation Organization (ICAO) Doc 9476-AN/927, Manual of Surface Movement Guidance and Control Systems (SMGCS)).

K. Surface Movement Surveillance System (SMSS). A system that provides positive identification and accurate positional information on all aircraft and vehicles.

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L. Surface Painted Holding Position Sign. Pavement marking that is used to identify a specific runway. These markings are configured the same as the associated sign (see AC 150/5340-1).

M. Surface Painted Direction Sign. Pavement markings that are configured the same as the associated sign and provided when it is not possible to provide taxiway direction signs at intersections (see AC 150/5340-1).

N. Surface Painted Location Sign. Pavement markings that are configured the same as the associated sign, and which are used to supplement the signs located alongside the taxiway and assist the pilot in confirming the designation of the taxiway on which the aircraft is located (see AC 150/5340-1).

O. Taxi Route. In this section, a specific sequence of lighted taxiways used by aircraft during low visibility operations.

P. Unserviceable. In this section, refers to equipment that is inoperative, obscured (i.e., by ice, snow, sand), degraded, not operating normally (e.g., abnormally low intensity), or not performing its intended function.

4-245 OPERATOR REQUIREMENT—LOW VISIBILITY TAXI AND TAKEOFF OPERATIONS.

A. General. Current ground operation systems have not always provided an adequate level of safety during night operations and low visibility conditions. There have been occurrences of aircraft accidents with resulting fatalities. SMGCSs were developed in accordance with AC 120-57 and were first implemented in September 1992.

1) These criteria outline the pilot crewmember training requirements under part 121, § 121.415(g) and part 135, § 135.329(e) in all weather, day, and night surface movement operations.

2) Inspectors must ensure that each air carrier initial and/or recurrent pilot ground-training programs include information about airport surface movement during night and low visibility environments and familiarization with airport markings, signs, and lighting.

3) Additional information can be found in AC 120-57, Appendix 1, Related Reading Material.

B. Flightcrew Training and Qualification Requirements. If an operator requests authorization to conduct lower-than-standard takeoffs, the flightcrew must be trained and qualified in their respective crew positions for the applicable takeoff minimums requested. The pilot in command (PIC) is ultimately responsible for ensuring that the flightcrew members are appropriately qualified before conducting an authorized lower-than-standard takeoff.

1) Individual pilots must be trained in their respective crew positions (parts 91 subpart K (91K), 121, and 135) and checked (parts 91K, 121, 125, and 135) in takeoffs using the appropriate requested minimums, before being approved for conducting such takeoffs.

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2) Pilot qualification must consist of an initial check that includes one takeoff at the lowest requested takeoff minimums. It is also required during each pilot's recurrent qualification cycle. This qualification must be completed in a flight simulator capable of replicating the applicable takeoff visibility, and the simulator must be set at (or lower than) the applicable takeoff visibility during such takeoffs.

3) Additional crew qualification for a check airman or a qualified FAA inspector, beyond that shown herein for regular flightcrews is not required.

4) Principal operations inspectors (POI) must ensure that operators requesting lower-than-standard takeoff minimums provide appropriate training for flightcrews, including the procedures listed below, as appropriate:

- Confirming the takeoff runway alignment (Safety Alerts for Operators (SAFO) 07003, Confirming the Takeoff Runway, includes guidance and/or advisory information about acceptable techniques);
- Rejected takeoffs in a low visibility environment;
- Low visibility instrument takeoff cross-check priorities;
- Engine failure during critical phases of takeoff in low visibility;
- Acceleration and climb disorientation factors and illusions;
- Use of Head-Up Display (HUD) takeoff guidance systems (when installed in aircraft for RVR 300 authorization only);
- Taxiing in a low visibility environment with emphasis on preventing runway incursion and SMGCS training (AC 120-57 includes guidance and/or advisory information about acceptable techniques);
- Taxiway critical areas;
- Crew coordination and planning;
- Required ground-based visual aids (such as stop bars and taxi holding position lights);
- Required ground-based electronic aids (such as ILS and transmissometers); and
- Determination of takeoff alternate airports.

C. Operations Specifications (OpSpecs)/Management Specifications (MSpecs)/Letters of Authorization (LOA). When appropriate, POIs will issue OpSpec C056 and/or C078 to parts 121 and 125 operators, OpSpec C057 and/or C079 to part 135 operators, and OpSpec C056 and/or C057 to part 129 foreign air carriers. These OpSpecs contain specific flightcrew, aircraft, and airport requirements when lower-than-standard takeoff minimums are used. Additional information specific to each OpSpec can be found in Volume 3, Chapter 18, Section 5 for domestic operators, and Volume 12, Chapter 2, Section 5 for part 129 foreign air carriers.

4-246 SMGCS OPERATIONAL APPROVAL FOR AIRPORTS.

A. Responsibilities. The Flight Technologies and Procedures Division (AFS-400) is the FAA headquarters (HQ) point of contact (POC) for the SMGCS program and will maintain a

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status list of SMGCS airports. When needed, AFS-400 will also provide advice and guidance in resolving SMGCS questions.

1) NextGen Branches. The RFSD NextGen Branches (AXX-220) are responsible for the approval of SMGCS operations at all airports. This approval is a joint responsibility of the regional AFS, Airports, and Air Traffic divisions. These responsibilities include:

a) Participation in SMGCS Meetings. A representative of the NextGen Branch should participate in SMGCS Working Group (WG) meetings.

b) Review and Approval of SMGCS Plans. The NextGen Branch is responsible for coordinating the review of draft SMGCS plans to determine conformance with the criteria contained in existing FAA Orders, ACs, and the guidance in this section. This should include coordination with Airports and Air Traffic. The airport operator will be notified of any deficiencies or recommendations. The NextGen Branch will also be the approving authority for SMGCS plans and subsequent revisions and SMGCS operations.

c) Onsite Inspection. An onsite inspection should be accomplished for all SMGCS airports and can be completed as an ongoing process, a specific event, or in association with the airport certification inspection. The inspection should be accomplished by the NextGen Branch, Airports, ATC personnel, and other airport tenant officials. The onsite inspection should be accomplished at night to simulate restricted visibility conditions, and will be used to evaluate lighting, markings, procedures, etc., as denoted in the SMGCS plan. The evaluation should also include the review of appropriate communications between ATC and the airport operator on the initiation and termination of SMGCS procedures, and availability of the airport SMGCS chart. Evaluation of alternative procedures of inoperative components such as stop bar and taxiway centerline lighting systems, surface movement radar (SMR), etc., should also be reviewed if installed. Noted deficiencies and corrective recommendations will be provided to the airport operator and appropriate organizations. The onsite inspection(s) should be completed prior to beginning initial SMGCS operations.

d) Tabletop Exercise. Prior to initial SMGCS operations at an airport, the appropriate representatives from the NextGen Branch (AXX-220), air traffic control tower (ATCT), Airports, the airport's Operations Department, and key tenants should conduct a tabletop exercise of the approved SMGCS plan. This exercise is to identify any unforeseen risks in the plan and to validate that training has been adequate.

e) Adherence to SMGCS Plans. When notified of a SMGCS deficiency or recommendation, the NextGen Branch will advise the appropriate FAA organization (Airports or ATC) and/or airport operator. Safety-related deficiencies may require the temporary withdrawal of approval for specified low visibility operations.

f) FAA HQ Coordination. In order to maintain a current status of SMGCS airports and their operations, the NextGen Branch should advise AFS-400 when a SMGCS plan and/or SMGCS operation is approved. If warranted, AFS-400 will be available to aid in resolving complex SMGCS questions.

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2) Airports Division—Controlling Region. The FAA's controlling regional Airports division will have responsibility for:

a) Participation in SMGCS Meetings. A representative of the Airports division and/or Airport District Office (ADO) should participate in SMGCS WG meetings.

b) Review of SMGCS Plans. The Airports division should review SMGCS plans in coordination with AFS and Air Traffic.

c) Advice and Guidance. The Airports division is responsible for providing advice and guidance to SMGCS WGs regarding such matters as the standards on lighting, marking, signs, and paving. They may also advise on the eligibility of projects for Airport Improvement Program (AIP) funding.

3) Air Traffic Division. The controlling FAA Air Traffic division will be responsible for those sections of the SMGCS plan that are under its control and should correct deficiencies that are observed or brought to its attention.

a) Participation in SMGCS Meetings. A local or regional Air Traffic representative should participate in SMGCS working group meetings. They should assure that designated low visibility routes and procedures will enhance the safe and expeditious flow of traffic on the movement area during low visibility conditions.

b) Advice and Guidance. Air Traffic is responsible for providing advice and guidance to SMGCS WGs.

c) Review of SMGCS Plans and Taxi Route Charts. Air Traffic is responsible for reviewing submitted SMGCS plans and low visibility taxi route charts in coordination with AFS and Airports. The chairman of the SMGCS WG will be notified of any deficiencies and recommendations. The low visibility taxi route charts will be coordinated with FAA HQ, Air Traffic Rules and Procedures Service (ATP), Terminal Procedures Branch (ATP-120) for suitability.

d) Initiation and Termination of SMGCS Procedures. Air Traffic will be responsible for initiating and terminating each phase of SMGCS procedures in accordance with the SMGCS plan. (Initiation of SMGCS procedures will take some time. Therefore, the implementation and termination should be based on meteorological trends of increasing/decreasing RVR values and weather phenomena, such as patchy fog and pilot reports.) ATC will notify airport operations of the pending initiation of SMGCS procedures. Airport Operations should notify the Air Traffic division when all appropriate tenants have been contacted. ATC will subsequently notify airport operations of their termination of low visibility operations.

e) Automated Terminal Information Service (ATIS). The initiation of SMGCS procedures should be broadcast on the ATIS.

f) For operations below RVR 600, ATC will operate stop bar lights where installed.

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g) Geographic Positioning. ATC will control aircraft and ground vehicles on the movement area by monitoring their geographic positioning and spatial relationship. The SMGCS plan should outline ATC procedures to be employed in the event the SMSS becomes inoperative during visibilities less than RVR 600.

h) Notifying and Assisting Aircraft Rescue and Fire Fighting (ARFF). During low visibility operations, the role of ATC in notifying and assisting ARFF services increases in significance. Procedures, systems, and/or techniques should be established and reviewed annually, in coordination with the airport operator, to ensure that aircraft requiring assistance can be located and ARFF services provided.

4) Airport Operator. The airport operator will be responsible for those sections of the SMGCS plan that are under its control and should correct deficiencies that are observed or brought to its attention. The airport operator will designate, from its staff, the chairperson of the airport's SMGCS WG. The airport operator should:

a) Call and chair meetings of the airport's SMGCS WG. This group should meet at least annually to review the SMGCS plan, procedures, and operations. They should also solicit attendance from appropriate personnel from the organizations listed in subparagraph 4-246B1).

b) Coordinate actions necessary to analyze the cost benefit study in regard to desired minimums to reach a WG consensus on which desired minimums is feasible and cost beneficial, and to achieve the installation and operation of facilities, equipment, and/or procedures required to support low visibility operations.

c) Coordinate the drafting, editing, submission, publication, distribution, and revision of the SMGCS plan.

d) Assure that initial and recurrent training on SMGCS procedures is accomplished and documented for ARFF personnel, airport vehicle operators, and tenant vehicle operators.

e) Notify other organizations having responsibilities under the SMGCS plan about deficiencies observed or brought to their attention that require their correction.

f) If remote electronic monitoring capability is not available, ensure the timely inspection of airfield visual aids, such as lights, signs, and markings. Assure timely issuance and cancellation of appropriate Notices to Airmen (NOTAM) regarding outages of airport facilities and equipment that support low visibility operations.

g) Notify tenants of ATC's impending initiation or termination of SMGCS procedures.

h) Advise ATC of airfield conditions or irregularities that may impact ATC operations.

i) Coordinate with the SMGCS WG actions necessary in developing a low visibility chart.

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j) Make follow-me services available.

5) Tenant Organizations. Airport tenants will be responsible for adherence to the SMGCS plan and will correct deficiencies that are observed or brought to their attention.

B. Initiation of SMGCS.

1) SMGCS WG. The airport operator, in consultation with the users, should establish a SMGCS WG for all takeoff and landing operations below RVR 1200. The SMGCS WG should include representatives from:

a) Airport staff involved with airfield operations, lighting, ARFF, security/traffic control, and any other appropriate personnel.

b) FAA ATC (local and/or regional).

c) FAA ADO or Regional Office (RO).

d) FAA AFS (local and/or regional).

e) FAA Airway Facilities Sector office.

f) Appropriate scheduled airlines.

g) Appropriate Airlines for America (A4A) representative.

h) Air Line Pilots Association International (ALPA) or other appropriate pilot groups.

i) Appropriate cargo/package operators and military aviation tenants.

j) Appropriate operators under part 91 and/or service corporations (includes general aviation and corporate operators).

2) Airport Evaluation. Since no two airports nor aircraft capabilities are alike, the SMGCS WG should review the existing airport layout, facilities, instrument flight rules (IFR) minimums, and operational procedures at the airport prior to the development of the airport SMGCS plan. Comparison of the existing and planned operating capability with the guidelines of AC 120-57 should determine what additional measures are necessary to achieve the desired low visibility operations. This review should include at least the following:

a) Airport layout and surface traffic patterns (includes runways, taxiways, fillets, and taxilanes used for current low visibility operations and those needed to achieve new low visibility operations).

b) Air traffic procedures used for current low visibility operations, and changes or additional facilities needed to support new low visibility operations.

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c) Surface lighting, marking, and signs used for runways, taxiways, taxilanes, and gate lead-in markings. (Identify additional needs in support of low visibility operations; i.e., stop bars, runway guard lights, clearance bars, taxiway centerline lighting, reflectors, geographic position markings, etc. Additionally, review the capability to electronically monitor and inspect lighting systems.)

d) Equipment, procedures, and training to support ARFF services in low visibility operations.

e) Ground support vehicle operations during low visibility conditions. (Review any restrictions, controls, or training needed, and whether airport operations or tenants will provide, if necessary, follow-me or towing services on the movement area.)

f) Protection of ILS critical areas and obstacle-free zones.

g) Snow removal equipment routing and priorities during low visibility conditions.

h) The adequacy of current airport charts.

i) Advanced technologies for below-RVR 600 operations (e.g., Enhanced Vision Systems (EVS), HUD systems, Forward Looking Infrared (FLIR) systems, and Global Positioning Systems (GPS)).

3) SMGCS Operations Minimum Selection. Most airports authorized for CAT II/III operations already have most of the basic airport signing, lighting, and marking required under a SMGCS plan. The additional requirements contained in AC 120-57 are designed to enhance the safety of low visibility operations. These requirements represent both an initial capital cost and continuing maintenance and operations budget requirements. Prior to establishing the ultimate low visibility minimums for the SMGCS plan, the SMGCS WG should perform a detailed analysis to insure that the benefits from seeking lower takeoff or landing minimums justify the initial costs of the equipment and continuing maintenance costs. The analysis should consider at least the following:

a) A compilation and evaluation of historic low visibility weather data for the airport. The data may be obtained from the National Oceanic and Atmospheric Administration (NOAA), Asheville, NC; the local National Weather Service (NWS); or other private industry sources. This data should reflect actual RVR values and be analyzed for time of day and the number and frequency of affected aircraft operations.

b) A determination of which users are capable of using the low visibility takeoff and landing procedures. This is available from the FAA-published CAT II/III Status List. The list contains current air carriers, aircraft type, and airport authorizations.

c) Costs for both RVR ranges—less than RVR 1200 down to and including RVR 600, and less than RVR 600. These costs may include:

1. Taxiway edge lights.

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2. Taxiway centerline lights (TCL).

3. Runway guard lights.

4. Stop bar lights.

5. Associated hardware and software.

6. Taxiway/ramp markings.

7. Airport surface detection equipment (ASDE) III or equivalent.

8. Expanded communications facilities/ramp control.

9. Paving (taxiway fillets).

10. Ground equipment/vehicles (follow-me, tow, or ARFF vehicles).

11. Charting.

12. Operation and Maintenance (O&M).

13. Training.

14. Personnel.

15. Other advanced technologies.

4) Airport SMGCS Plan. A detailed SMGCS plan should be developed for each airport to cover existing or planned low visibility operations. AC 120-57, Appendix 2 contains a sample SMGCS plan. AC 120-57, Appendices 3 and 4 contain guidance for developing a SMGCS plan.

a) Airports with takeoff and/or landing operations below RVR 1200 should submit to the NextGen Branch (AXX-220) a completed SMGCS plan. The plan should include a timetable for budgeting and implementing the various components of the proposed plan. The airport operator should promptly initiate action to institute its SMGCS plan once FAA approval to proceed is received. Upon receipt of the plan, the FAA will advise the airport operator which actions included in the timetable, if any, should be delayed.

b) The SMGCS plan should cover planned low visibility operations. Each low visibility operation and taxi route should be described in detail with its supporting facilities and equipment.

c) The plan should clearly identify the responsibilities of those involved (e.g., airport operator, ATC, ARFF, air carriers, and ground vehicle operators). The plan should also clearly identify how and when these responsibilities will be carried out (e.g., the plan may identify different requirements for operations between RVR 1200 and RVR 600, and those operations below RVR 600).

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d) All SMGCS plans should be submitted to the appropriate FAA NextGen Branch (AXX-220) for approval.

e) Revisions to SMGCS plans may be accomplished by the SMGCS WG, when desired, and routed through the NextGen Branch (AXX-220) for approval.

C. Visual Aid Requirements. During low visibility operations, adequate visual cues to pilots and vehicle operators are necessary in order to maintain their situational awareness (SA) and to ensure the continuation of safe, efficient ground operations. Visual aids should be installed in accordance with the standards set forth in the AC 150/5340-series (listed in Appendix 1).

1) Taxiway Lighting—Movement Area.

a) For operations below RVR 1200, one of the following should be installed along each taxi route in the movement area:

1. Taxiway edge lights; or

2. TCLs supplemented with raised edge reflectors on curves and turns.

NOTE: Centerline lights are more effective than edge lights in low visibility operations; however, at airports where ice and snow could obscure centerline lights, it may be advantageous to install edge lights.

b) For operations below RVR 1200, taxiway edge lights should be installed at intersections along the taxi route where an aircraft is expected to turn, and the taxiway width or pavement fillet does not meet the design standards of the current edition of AC 150/5300-13, Airport Design. (See AC 120-68, Appendix 1.)

c) For operations below RVR 600, TCLs supplemented on curves and turns with edge lights should be installed along each taxi route in the movement area. The TCLs should extend continuously from the runway centerline (RCL) to the non-movement area. When the taxi route crosses or extends onto a runway, RCL lights should be installed.

NOTE: It is recommended that taxiway lights be turned off, to the maximum extent possible, on those taxiways or runway exits that are not part of a low visibility taxi route.

2) Taxiway Lighting—Non-Movement Area.

a) For operations below RVR 1200, down to and including RVR 600, neither lighting nor reflectors are required.

NOTE: The installation of taxiway centerline (TCL) lights or, secondarily, TCL reflectors, is recommended along taxiway and taxilane centerlines to provide improved guidance.

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b) For operations below RVR 600:

1. TCLs should be installed, or

2. The SMGCS plan must contain provisions for taxiing assistance for pilots in the form of a follow me vehicle, towing via a tug or ground marshalling.

3) Lights at Access to Active Runways.

a) For operations below RVR 1200:

1. Except as provided in the following paragraph, all taxiways that provide access to an active runway (regardless of whether they are part of the low visibility taxi route) should have runway guard lights installed at the runway holding position on the taxiway. If both a runway holding position and ILS critical area holding position marking are present, runway guard lights should be installed at the runway holding position only. (See AC 120-57, Appendix 5.)

2. In certain instances, the SMGCS WG may determine that runway guard lights may not be necessary at certain taxiway/runway intersections. In making such an evaluation, the WG should consider if the intersection and runway environment is safeguarded from the inadvertent entry of aircraft and vehicles through other means (e.g., traffic volume and routings, airport configuration).

NOTE: The new installation or upgrading of elevated runway guard lights may not be required if in-pavement runway guard lights or stop bar lights are installed at the same location.

b) For operations below RVR 600:

1. In addition to the criteria specified in subparagraph 4-246C2)a), all illuminated (i.e., centerline and/or edge lights turned on) taxiways that provide access to an active runway (regardless of whether or not they are part of the taxi route) should have stop bar lights installed at the runway holding position. If both a runway holding position and an ILS critical area holding position marking are present, the stop bar should be installed at only the ILS critical area holding position. Stop bars on taxiways, which are used to enter or cross an active runway, should be capable of being operated individually. Such stop bars are termed “controlled stop bars.” The remaining “uncontrolled” stop bars may be operated by a single switch. Stop bar lights are used to positively control access to an active runway. At the approach end of a runway, in-pavement green lead-on lights will illuminate to provide a secondary visual confirmation of clearance onto the runway by ATC personnel.

2. All non-illuminated taxiways (i.e., centerline and edge lights turned off) will be considered not available for taxiway or runway access, and do not need stop bars installed. However, the SMGCS WG should evaluate the need for any additional “uncontrolled” stop bars.

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4) Runway Guard Lights. There are two configurations of runway guard lights. The following criteria should be used to determine which configuration should be installed at a specific runway holding position.

a) Elevated runway guard lights should be installed at the runway holding position if the taxiway does not have TCLs installed and is 150 feet wide or less. However, if the taxiway has a stop bar installed at the runway holding position, elevated runway guard lights should be co-located with the stop bar, regardless of taxiway width or the presence of TCLs.

b) In-pavement runway guard lights should be installed at the runway holding position if the taxiway is greater than 150 feet wide or a stop bar is installed at the ILS critical area holding position.

c) In-pavement combination stop bar/runway guard light fixtures (dual red/yellow lens) may be installed at the discretion of the airport operator. The yellow in-pavement lights may not be turned on when the stop bar is in operation. If the stop bar is located at an ILS critical area holding position, dual red/yellow fixtures should not be selected. (This would result in the installation of two sets of runway guard lights at different locations that serve the same intersection.)

NOTE: At airports where ice and snow could obscure in-pavement runway guard lights, it may be advantageous to also install elevated runway guard lights.

5) Clearance Bars/Holding Position Markings. Hold points along taxi routes should be appropriately denoted by the following:

a) For operations below RVR 1200, taxiway holding position markings should be painted to denote hold points.

b) For operations below RVR 600, clearance bar lights should be installed at hold points, in addition to the taxiway holding position marking and geographic position marking.

6) Taxi Guidance Signing and Marking.

a) For operations below RVR 1200, taxi guidance signs should be installed at taxiway intersections. Surface painted signs should be located on the pavement where they will enhance the operation as determined by the SMGCS WG, or where it is not feasible to install guidance signs.

1. Paint markings that are bright and which provide good contrast with the pavement are a significant low visibility guidance aid. These markings along low visibility taxi routes should receive special attention and be repainted when the conspicuity is degraded through wear and tear. Taxiway centerline markings, outlined with black borders, should be painted on light-colored pavements.

2. The use of reflective or glass beaded paint should be used for geographic position markings. Glass beads should not be added to black paint.

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b) For operations below RVR 600, geographic position "spot" markings identifying hold points, and co-located with a lighted clearance bar light, should be painted on the taxiway pavement. A geographic position marking located without a taxiway clearance bar light can also be used for positioning information or where location verification or additional guidance is expected to be needed. These markings will be at locations in the movement area where they enhance low visibility operations as determined by the SMGCS WG.

7) Monitoring and Visual Inspection of Lighting Aids. Controlled stop bars should be electronically monitored with a status indication provided in the ATCT. It is recommended that all other lighting systems that support low visibility operations be electronically monitored.

a) For operations below RVR 1200:

1. An initial visual inspection of stop bar lights, runway guard lights, clearance bar lights, TCLs, and taxiway edge lights installed on the low visibility routes or taxiways that intersect the low visibility runway(s) should be conducted by the airport operator prior to the implementation of SMGCS procedures. This visual inspection is conducted to ensure that the lighting systems are "serviceable" as described in subparagraph 4-246C8), and that the lighting system status indicated on any associated electronic monitoring systems reflect the actual operating condition of the lights. All controlled stop bars should be checked for proper function (i.e., operation of sensors, lead-on lights, etc.). TCLs that lie beyond all uncontrolled stop bars are not part of a standard stop bar system and therefore need not be visually inspected.

2. A periodic visual inspection need not be conducted for lighting systems described in AC 120-57, subparagraph 8f(1)(a) that are electronically monitored, except when meteorological conditions may render them unserviceable (e.g., snow, blowing snow, sand, etc.). Those lighting systems that are not electronically monitored should be periodically inspected every 2 to 4 hours. The interval is normally based on taxiway complexity/configuration, number of low visibility routes, number of taxiways that provide access to active runways, etc.

b) For operations below RVR 600:

1. With the following exception, a visual inspection of stop bar lights, runway guard lights, clearance bar lights, TCLs, and taxiway edge lights installed on the low visibility routes or taxiways that intersect the low visibility runway(s) should be conducted by the airport operator prior to the commencement of operations below RVR 600. Exception: Unless meteorological conditions may render the lights unserviceable (e.g., snow, blowing snow, sand, etc.), the status of any of the aforementioned lighting systems that are electronically monitored may be determined from the lighting status indication on the monitor, provided that the monitor is capable of remotely detecting the unserviceability conditions in subparagraph 4-246C8). An inspection conducted within 2 hours prior to commencement of operations below RVR 600 would be acceptable for this inspection. This visual inspection is conducted to ensure that the lighting systems are serviceable as described in subparagraph 4-246C8). Because controlled stop bars are checked for proper function at the initial visual inspection and because of continuous use by aircraft, re-inspection of stop bars for

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functionality need not be performed. TCLs that lie beyond uncontrolled stop bars need not be visually inspected.

2. The serviceability of lighting systems described in subparagraph 4-246C7)b)*1*, except taxiway edge lights, which are electronically monitored with a system capable of remotely detecting the unserviceability conditions in subparagraph 4-246C8), should be determined every 2 hours from the lighting status indication on the monitor. Lighting systems that are not electronically monitored with a system of the same capability should be periodically inspected every 2 hours to ensure that the lighting systems remain serviceable. The periodic inspection of controlled stop bars need not include a check for proper function. TCLs that lie beyond all uncontrolled stop bars need not be visually inspected.

8) Maintenance Criteria for Lighting Aids.

a) Taxiway edge lights, TCLs, clearance bar lights, runway guard lights, and stop bar lights supporting low visibility operations that are not electronically monitored should be included in a system of preventive maintenance that has the following objectives:

1. Taxiway edge lights, taxiway edge reflectors, and TCLs along the low visibility taxi route: no two adjacent lights or reflectors unserviceable.

2. Stop bar lights or in-pavement runway guard lights: no more than three lights per location unserviceable nor two adjacent lights unserviceable.

3. Elevated runway guard lights: no more than one light in a fixture unserviceable.

4. Clearance bar lights: no more than one light unserviceable.

b) When any of the lighting aids do not meet the maintenance objectives above:

1. Traffic should be rerouted to areas where the visual aids are operating normally;

2. Alternative procedures should be implemented to accommodate the operations; or

3. Low visibility operations should be terminated until the lighting aids are returned to normal service.

c) Lighting aids along the low visibility taxi route(s) that are inoperative should be repaired promptly with minimal disruption of service. If warranted, appropriate NOTAMs should be issued or canceled expeditiously.

9) Maintenance Criteria for Lighted Signs.

a) Mandatory instruction signs at entrances to the active low visibility runway(s) and location and direction signs along low visibility taxi routes where aircraft will be required to

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hold or turn should be inspected prior to implementation of SMGCS procedures, and every 2 to 4 hours thereafter while the SMGCS plan is in effect.

b) When any required sign is not illuminated, unserviceable, or missing, it should be repaired promptly with minimal disruption of service. If warranted, appropriate NOTAMs should be issued or canceled expeditiously, and:

1. Traffic should be rerouted to areas where the visual aids are operating normally;

2. Alternative procedures should be implemented to accommodate the operations;

3. Low visibility operations should be terminated until the sign(s) are returned to normal service.

D. SMSS.

1) For operations below RVR 1200, an SMR, such as ASDE-III equivalent, or alternative technologies that allow ATC to establish the geographic position of all aircraft and vehicles may be used.

2) For operations below RVR 600, an SMR should be installed and operational. In the event that the SMR becomes inoperative during operations below RVR 600, operations may continue while utilizing approved geographic positioning procedures until operations below RVR 600 are terminated. The SMR must be operational before resuming operations below RVR 600.

E. Airport Facilities and Services.

1) ARFF. During reduced visibility conditions, the role of ATC in notifying and assisting ARFF services increases in significance. Procedures, systems, and/or techniques should be established and reviewed annually, in coordination with the airport operator, to ensure that aircraft requiring assistance can be located and ARFF services provided. For operations below RVR 600, the pre-positioning of ARFF equipment (so as not to create a new obstacle), installation of FLIR and GPS, or other approved alternative technology should be considered.

2) Taxiway Configuration. The SMGCS WG should examine the airport for adequacy of fillets and landing gear and/or wingtip clearances along taxiways used in low visibility conditions.

a) For operations below RVR 1200, it is recommended that inadequate taxiway fillets be upgraded to meet current standards. Those locations that are not upgraded should be depicted on appropriate SMGCS low visibility taxi route charts. The notation may be in the form of a symbol identifying specific turning points or a general note such as “judgmental oversteering required along the taxi route.”

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b) For operations below RVR 600, inadequate taxiway fillets and clearances at turning points or other locations along taxi routes used for operations below RVR 600 should be upgraded to meet the current standard.

3) SMGCS Low Visibility Procedures. SMGCS procedures should be developed for each SMGCS airport authorized for low visibility operations. The procedures should include a method of notifying key personnel of participating organizations that SMGCS procedures have been initiated or terminated by ATC. Copies of the approved SMGCS plan and any revisions should be provided to all parties involved.

a) All vehicle operators should receive SMGCS training in areas such as airport lights, signs, and markings procedures to follow if lost in the aircraft movement area, and (if applicable) radio telephone procedures, including lost-communication procedures. The airport operator should review driver-training programs to ensure that low visibility procedures are included and the training is documented. Vehicle operators supporting SMGCS operations should have a low visibility taxi route chart or equivalent available.

b) Procedures for evaluating special situations such as construction activities, snow removal, and deicing procedures should be included in the SMGCS plan to determine any limitations that should be imposed on those vehicle activities when the SMGCS plan is implemented.

c) For operations below RVR 1200, describe the method of limiting vehicle access to aircraft movement areas. Vehicular traffic in the movement areas should be restricted to the essential minimum to support low visibility operations. The SMGCS WG should review vehicle control and, if necessary, identify additional marking, lighting, restrictions, or other measures necessary to control vehicles in non-movement areas.

d) For operations below RVR 600, the SMGCS WG should ensure positive control of vehicles in situations where active roadways cross-designated taxi routes in movement areas. This may include such methods as barriers, gates, signs, markings, traffic lights, and road guards.

4) Apron Traffic Management. For operations below RVR 600, the SMGCS plan should include an apron traffic management plan for all non-movement apron areas used by aircraft or vehicles. The apron traffic management plan should indicate the party(s) who will coordinate the traffic movement in the apron area. The apron management entity(s) must limit access to the apron area to ensure the safe movement of all aircraft and vehicles operating within the area. Roadways which cross taxilanes must be kept clear by positive control methods, such as radio communications, when aircraft are using the apron area.

5) Taxiing Assistance in Non-Movement Areas. For operations below RVR 600, where centerline lights are not installed, the SMGCS plan must contain provisions for taxiing assistance. Taxiing assistance may include such measures as follow-me vehicles or towing via a tug. The assistance should be provided by a method agreed upon by the SMGCS WG. Ground marshalling may be used to assist aircraft from the intersection of the taxilane centerline and the gate lead-in line.

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F. Airport Condition Reporting. The loss of minimums for low visibility landings or takeoffs can adversely affect aircraft operations, overall safety, and capacity. There are a number of critical components such as stop bar lights, centerline lights, etc., which, if they become inoperative, may have an immediate impact on availability of takeoff or landing operations. This especially affects operations below RVR 600. It is time critical that pilots and dispatchers be notified quickly of these outages and their effects on operations. This will enable timely and appropriate decisions to be made.

1) Due to its importance, such adverse impacts on operations should be quickly disseminated by the airport operator via means available (i.e., landline communications) to local station dispatchers and on ATIS in order to alert pilots of aircraft inbound to the airport.

2) The timely notification of inoperative components should be thoroughly covered in the SMGCS plan and with interested parties such as ATC, the airport operator, and local tenants.

3) Inoperative components affecting low visibility operations may be reported through the NOTAM system and/or the FAA Traffic Management System (TMS).

G. Flight Operations. The SMGCS plan should identify any aspects of the following list of items that are specific or unique to the airport, relative to low visibility operations. Aircraft operators should address these items in appropriate training programs for all flightcrew and ground support personnel who may be involved in aircraft or vehicle operations on the movement or non-movement areas of the airport. Such training should also be documented. Training items include but are not limited to:

1) Apron (ramp) operations.

2) ILS critical areas, runway safety areas, and obstacle-free zones.

3) Stop bar lights.

4) Runway guard lights.

5) TCLs, including ILS critical areas alternating green and yellow lights from RCL.

6) Clearance bar lights.

7) Runway lead-on and lead-off lights.

8) Geographic position markings.

9) Taxiway and runway hold position markings.

10) Movement/non-movement boundary marking.

11) Other pavement markings such as surface painted signs.

12) Use of low visibility taxi route(s) chart(s).

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13) Taxi procedures at turns requiring judgmental oversteering.

H. Airport Low Visibility Taxi Route(s) Chart.

1) A low visibility taxi route(s) chart(s) must be provided for use by flightcrew, ATC personnel, ARFF personnel, ground support vehicle operators, and ground marshalling crews, if appropriate. The airport low visibility taxi route chart should be limited to one page, if possible, and is generated by the SMGCS WG in coordination with regional ATC, AFS, and Airports divisions. The taxi route chart is coordinated with AFS-400 and approved by the regional Automated Weather Observing System (AWOS) and concerned ATC personnel.

2) The chart(s) should provide at least the following information:

a) Designated low visibility taxi route(s) for operations below RVR 1200 down to and including RVR 600.

b) Designated low visibility taxi route(s) for operations below RVR 600, if applicable.

c) A legend depicting appropriate symbology and terminology.

d) Location of runways, taxiways, aprons, and concourses.

e) Location of runway and TCLs, including lead-on and lead-off lights.

f) Location of stop bar lights.

g) Location of geographic position markings.

h) Location of taxiway hold points.

i) Location of clearance bar lights.

j) Location of movement area boundaries.

k) Location of inadequate fillets on taxiway turns and the need for judgmental oversteering by pilots.

l) Location of deicing pads.

m) Location of ARFF stations.

n) Unique airport characteristics and/or procedures.

I. Sample SMGCS Plan. Figure 4-20, Sample Surface Movement Guidance and Control System, contains a sample SMGCS plan. The airport depicted in this sample plan is fictitious. This plan describes only operations less than RVR 1200 down to and including RVR 600. When developing the SMGCS plan, Table 4-6, Quick Reference Guide—RVR 1200 to RVR 600 Requirements, and Table 4-6A, Quick Reference Guide—Less-Than-RVR 600

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Requirements, may be used. They contain quick reference guides relating the SMGCS requirements to the guidance in this section.

Table 4-6. Quick Reference Guide—RVR 1200 to RVR 600 Requirements

Requirement	Reference
Approved Surface Movement Guidance and Control System (SMGCS) plan developed in accordance with AC 120-57, Surface Movement Guidance and Control System, current edition.	4-241
Either taxiway edge lights or taxiway centerline lights (TCL) with raised edge reflectors on curves and turns.	4-246C1)a)
Taxiway edge lights at all difficult turns (not in compliance with design standards of AC 150/5300-13, Airport Design, current edition).	4-246C1)b)
No special non-movement area requirements below RVR 1200 (however, TCLs are recommended).	4-246C2)a)
Runway guard lights (RGL) at runway holding position (in-pavement RGL required if taxiway is wider than 150 feet).	4-246C3)a) and b)
Taxi guidance signs at all intersections.	4-246C6)a)
Twelve-inch taxiway lines highlighted with black borders (light surfaces). (All paint markings of high quality—not worn.)	4-246C6)a)1
Holding position markings and geographic position (pink numbered circles and intermediate holding point markings). (Glass beaded or reflective paint.)	4-246C5)a)
Initial visual inspection of all SMGCS lighting prior to starting SMGCS operations.	4-246C7)a)1
Unmonitored lights periodic (2- through 4-hour inspections in SMGCS operations).	4-246C7)a)2
Surface Movement Surveillance System (SMSS) or alternative technologies that allow air traffic control (ATC) to establish the position of all aircraft and vehicles.	4-246D1)

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Table 4-6A. Quick Reference Guide—Less-Than-RVR 600 Requirements

Requirement	Reference
All of the Requirements for Operations below Runway Visual Range (RVR) 1200.	
Taxiway centerline lights (TCL) supplemented on turns and curves with edge lights. TCLs continuous starting from runway centerline (RCL). (Non-SMGCS taxiway lights should be turned off.)	4-246C1)c)
Non-movement area TCLs or follow-me or aircraft towing or ground marshalling.	4-246C2)b)
Stop bar lights at runway holding position unless instrument landing system (ILS) critical area is separated from runway holding position; stop bars are only at ILS critical area hold position, and RGLs are at the runway hold position (elevated stop bars if bad weather radar obscures stop bars).	4-246C3)b)1
Controlled stop bars at runway crossings, and runway entrances. (At approach ends, also in pavement lead on lights linked with controlled stop bars.)	4-246C3)b)1
All unlit taxiways are *not* available for taxi.	4-246C3)b)2
Must consider specific extra stop bar needs depending on airport set up.	4-246C3)b)2
Combination in-pavement stop bar/runway guard lights (dual red/yellow are at the option of the airport management except when Stop Bar has to be at the ILS critical area holding position.	4-246C4)
Clearance bar lights located at all taxiway geographic position markings (the pink numbered circles) (“spots”).	4-246C5)b)
Geographic position markings to be used in addition to holding position markings where location identification clarification is needed.	4-246C6)b)
Surface Movement Surveillance System (SMSS) and a procedure for SMSS failure below RVR 600.	4-246D2)
Prior to operations below RVR 600 inspect: 1. Stop bar lights. 2. Runway guard lights (Wig Wags) OR monitoring with: 3. Clearance bar lights remote unserviceability. 4. TCLs’ capabilities. 5. Taxiway edge lights on SMGCS taxiways. 6. Inspection of lights or detection every 2 hours in < RVR 600 operations.	4-246C7)b)
Inoperative Components—when replacement required:	4-246C8) and 9)

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1. Taxiway lights—2 adjacent lights or reflectors. 2. Stop bar lights—more than 3 lights or 2 adjacent. 3. In-pavement RGL—more than 3 lights or 2 adjacent. 4. Elevated RGL—more than 1 light in a fixture. 5. Clearance bar lights—more than 1 light. 6. Taxiway sign—must be lighted. 7. During SMGCS, reroute traffic or stop operations until corrected.	

Figure 4-20. Sample Surface Movement Guidance and Control System Plan

Surface Movement Guidance and Control System Plan for _____ International Airport

February 29, 2008

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1.0 INTRODUCTION

1.1 This Surface Movement Guidance and Control System (SMGCS) plan describes enhancements, procedures and actions at _____ International Airport (_____) that are applicable to the airport operator, air traffic control (ATC), airlines, and other tenants of the airport during low visibility conditions.

1.2 These enhancements, procedures, and actions are in accordance with the guidance set out in FAA Advisory Circular (AC) 120-57, Surface Movement Guidance and Control System (SMGCS), current edition. A SMGCS plan is necessary for airports where scheduled air carriers conduct takeoff or landing operations in visibility conditions of less than Runway Visual Range (RVR) 1200.

1.3 The procedures contained in this plan were developed by the SMGCS Working Group (WG), which consisted of representatives from: Airport staff involved with airfield operations, lighting, Aircraft Rescue and Fire Fighting (ARFF), security/traffic control, and airport consultants; FAA ATC (local and/or regional); FAA Airports District or Regional office; FAA Flight Standards (local and/or regional); FAA Airway Facilities Sector office;

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appropriate scheduled airlines; appropriate Airlines for America (A4A) representative; Air Line Pilots Association International (ALPA) or other appropriate pilot groups; appropriate cargo/package operators; military aviation tenants; appropriate operators under 14 CFR part 91; and service corporations. (Includes general aviation and corporate operators.)

1.4 This document does not supersede established policies, procedures, rules, or guidelines for airports, aircraft or vehicle operators, or ATC. It does prescribe certain airfield lighting and marking improvements and operating procedures that have been designed to enhance the safety and efficiency of aircraft and vehicle movements.

1.5 To enhance the safety of low visibility operations, part 91 operators should follow the guidance in this plan to the maximum extent possible and expect follow-me assistance to and from the runway environment.

1.6 This plan addresses both current and future enhancements to support low visibility takeoff, landing, and taxiing operations at the airport. The work of the SMGCS WG will continue after the initial plan is approved by the FAA. The SMGCS WG should meet as necessary, but not less than once a year to assess low visibility operations, and to modify the plan as necessary.

2.0 DEFINITIONS

2.1 Airfield. That portion of the airport intended to be used wholly or in part for the arrival, departure, and movement of aircraft.

2.2 Airport Apron Controller. The term “airport apron controller” refers to personnel from the airlines and “airport operations” providing joint control of the concourse non-movement area.

2.3 Airport Operations. The term “airport operations” refers to personnel assigned from the airport operations department who are “responsible for the overall management of the airfield. This may include airport security, technical services, apron control, air cargo area, airport operations and safety, and other activities specified in 14 CFR part 139.

2.4 Apron (Ramp). A defined area on an airport intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, parking, and maintenance. The apron area includes the following components:

(1) Aircraft Parking Positions. Intended for parking aircraft to enplane/deplane passengers, load or unload cargo.

(2) Aircraft Service Areas. On or adjacent to an aircraft parking position. Intended for use by personnel/equipment for the servicing of aircraft and staging of equipment to facilitate loading and unloading of aircraft.

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(3) Taxilanes. Apron areas that provide taxiing aircraft access to and from parking positions.

(4) Vehicle Roadways. Identified rights-of-way on the apron area designated for service and ARFF vehicles.

2.5 Clearance Bar. A clearance bar consists of three in-pavement steady-burning yellow lights.

2.6 Controlling Region. Refers to the FAA geographic region in which an airport is located.

2.7 Geographic Position Marking. Pavement markings used to identify the location of aircraft or vehicles during low visibility conditions. They are referred to as “spots” by ATC.

2.8 Low Visibility Operations. The movement of aircraft or vehicles on the airport paved surfaces when visibility conditions are reported to be less than RVR 1200.

2.9 Movement Area. Refers to the runways, taxiways, and other areas of an airport that are used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps, and aircraft parking areas.

2.10 Non-Movement Area. Refers to taxiways and apron areas that are not under ATC.

2.11 Runway Guard Lights (Elevated). Fixture consists of a pair of elevated flashing yellow lights, installed on both sides of a taxiway, at the runway hold position marking. Their function is to confirm the presence of an active runway and assist in preventing runway incursions.

2.12 Runway Guard Lights (In-Pavement). Fixtures consists of a row of in-pavement flashing yellow lights installed across the entire taxiway at the runway hold position marking. Their function is to confirm the presence of an active runway and assist in preventing runway incursions.

2.13 Stop Bar. Stop bar lights consist of elevated and in-pavement red fixtures that are installed at the runway holding position or ILS critical area holding position marking. Stop bars may be controllable by ATC and will include a system of in-pavement green taxiway centerline/lead-on lights at locations where aircraft will enter or cross a runway.

2.14 Surface Movement Guidance and Control System (SMGCS). A SMGCS system consists of the provision of guidance to, and control or regulation of, all aircraft, ground vehicles, and personnel on the movement area of an aerodrome. Guidance relates to facilities, information, and advice necessary to enable the pilots of aircraft, or the drivers of ground vehicles, to find their way on the aerodrome and to keep the aircraft or vehicles on the surfaces or within the areas intended for their use. Control or regulation means the measures necessary to prevent collisions and to ensure that the traffic flows smooth and freely.

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2.15 Surface Painted Holding Position Sign. Pavement marking which is used to identify a specific runway. These markings are configured the same as the associated sign.

2.16 Surface Painted Direction Sign. Pavement markings that are configured the same as the associated sign and provided when it is not possible to provide taxiway direction signs at intersections.

2.17 Surface Painted Location Sign. Pavement markings that are configured the same as the associated sign, that are used to supplement the signs located alongside the taxiway, and that assist the pilot in confirming the designation of the taxiway on which the aircraft is located. (See AC 150/5340-1, Standards for Airport Markings, current edition.)

2.18 Taxi Route. A specific sequence of lighted taxiways used by aircraft during low visibility operations.

3.0 FACILITIES, SERVICES AND EQUIPMENT

3.1 Runways. The airport has two north-south parallel runways that are used, individually or in combination, for both takeoffs and landings in a northerly flow direction for this plan. Runway 35L and Runway 35R are useable for takeoffs and landings down to RVR 600. Each of these runways are 12,000 feet long and are served by Category (CAT) III instrument landing systems (ILS); touchdown, midpoint, and rollout RVR equipment; runway instrument markings; Approach Lighting System with Sequenced Flashing Lights (ALSF)-2; touchdown zone (TDZ) and centerline lighting; and high-intensity edge lighting.

3.2 Taxiway Lighting. Continuous green taxiway centerline lights and blue taxiway edge lights are installed on all taxiways leading to and from the low visibility runways. Continuous green taxiway centerline lights are installed on all apron taxiways. Taxi routes and taxi procedures are described in paragraph 6, Air Traffic Control Procedures.

3.3 Runway Guard Lights. Elevated runway guard lights are located at all runway access points and may be illuminated at all times to prevent runway incursions.

3.4 Stop Bars. Lighted stop bars are installed at all runway access points. During low visibility operations, the stop bars, located on the first two taxiways that are used as runway entrances for departure aircraft on Runway 35L and Runway 35R, are controlled by ATC.

3.5 Taxiway Clearance Bars. Taxiway clearance bars are located at various locations throughout the Airport. These clearance bars occur at the edges of runway protection zones where aircraft tail heights or vehicles might penetrate runway operational surfaces, and where taxiway-to-taxiway intersections warrant additional caution. Clearance bars are illuminated whenever the taxiway centerline lights are illuminated. Aircraft are not required to hold at a taxiway clearance bar unless directed to do so by ATC.

3.6 Taxiway Guidance Signing and Marking Inspections. Taxiway guidance signing and marking are inspected routinely as part of the airport operations' airfield inspection program. Electronic monitoring is provided for all signs and lights associated with low visibility taxi

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routes. This monitoring alerts ATC whenever threshold outage levels are exceeded. Airport maintenance is also notified by an alarm and will take corrective action.

3.7 Non-Movement Area Control. Control of the non-movement area between and around the concourses is administered by the airlines and/or the airport operations department. Other non-movement areas are controlled by the tenants of those respective areas. Appropriate movement/non-movement area markings are installed on apron edges.

3.8 Surface Movement Surveillance. The airport has airport surface detection equipment (ASDE-III). FAA utilizes this equipment to monitor the geographical position of aircraft and vehicles during reduced visibility conditions and at night.

3.9 Follow-Me Service. The airport operations department will provide follow-me service for air carrier aircraft upon request, subject to availability of equipment and the need to accomplish higher priority duties. To enhance safe operations in low visibility conditions, part 91 operators should expect follow-me services to and from the runway environment. The airport operations follow-me vehicle is identified by yellow flashing emergency lights. A follow-me request may be initiated by the pilot, ATC, or the airport apron controller.

3.10 Aircraft Docking. The airline assumes control of the aircraft in the vicinity of the gate, as directed by the airport apron controller, and provides aircraft docking by the use of wing walkers, follow-me vehicles, tugs, or other appropriate means as set out in the airline's operations manual.

4.0 AIRCRAFT RESCUE AND FIRE FIGHTING (ARFF)

4.1 ARFF Coverage. Each of the ARFF stations provide primary coverage during low visibility operations, depending on runway use configuration. ARFF Station #1 is located at the intersection of Taxiway AA and Taxiway G and provides primary coverage to the west airfield. ARFF Station #2 is located adjacent to Runway 17R on Taxiway CS and provides primary coverage to the east airfield. Equipment and personnel will remain on alert status at these stations when low visibility operations are in progress.

4.2 ARFF Coordination. Coordination between ATC and ARFF is accomplished annually to ensure effectiveness of ARFF services. This coordination is accomplished as part of the annual airport emergency plan review required by part 139.

5.0 VEHICLE CONTROL

5.1 Vehicle Access. Vehicle access to the airport is controlled by a system of perimeter fencing and gates. All airport and tenant vehicles entering the Airport Operations Area (AOA) are identified by a mandatory apron access permit displayed on the windshield of the vehicles, which is obtained from the airport operations department and enforced by airport security. Vendors and contractor vehicles are also identified through the apron permit system or are escorted by authorized personnel. Airport security shall ensure that all vehicles operating on the AOA are properly marked and lighted. During low visibility conditions, vehicles requiring

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access from outside the restricted security area must be cleared by airport operations through a security gate before entrance is gained to the AOA.

5.2 Vehicle Service Roads. Except for the necessary movement in leased areas, vehicles must be operated within the clearly marked system of vehicle service roads. These service roads are identified by solid white edge lines with a dashed white line used as centerline divider. Where a service road intersects a taxiway, a solid white stop line is provided across the vehicle lane at a point that assures adequate clearance from taxiing aircraft. Standard stop and yield signs are installed in line with the stop line (on the right side of the road) at each service road entrance onto a taxiway. Dashed white lines may be provided across certain taxiways where driver reference is needed, because of the width of the intersecting taxiway and the possibility of the driver becoming lost in low visibility conditions.

5.3 Driver Training. Vehicles driven on the AOA during low visibility conditions will only be operated by drivers who have completed SMGCS driver training. All personnel authorized to drive on the airfield in movement or non-movement areas are provided driver training by the airport operations department. Exception: Qualified tenants may provide training to their employees under the supervision of the airport operations department. Construction crews and other temporary access personnel are provided individual instruction by airport operations. All airport and tenant driver-training courses use video training aids, which include SMGCS lighting, signing, marking, and procedures and include written tests. Drivers are instructed to pay particular attention to striped and dashed yellow lines used in combination with one another; i.e., a single stripe and single dash, or two stripes and two dashes. These markings denote runway holding positions or the movement/non-movement area boundary and must not be crossed without authorization from ATC. The driver training programs are reviewed annually by airport operations to ensure that they are current.

5.4 Access Restrictions. Only vehicles operated by the airport or by FAA Airway Facility (AF) maintenance personnel are allowed on the airport movement area. All other access to the movement area will be coordinated and approved by airport operations. In low visibility conditions, no vehicles are permitted in the movement area that are not in direct support of the SMGCS plan.

6.0 ATC PROCEDURES

6.1 Background and Operating Concept. The SMGCS plan provides guidance and control of aircraft between various apron locations and the runways in a safe and efficient manner during low visibility conditions. The coordinated efforts of ATC and airport operations are all focused on assuring safe movement and avoiding inadvertent or unauthorized entry onto the movement area during low visibility conditions. When one portion of the airport is in a low visibility condition (i.e., visibility less than RVR 1200), the entire airport is considered to be in low visibility conditions and SMGCS procedures and restrictions are placed in effect. The concept for accomplishing these objectives is to only use the north-south runways in a northerly flow direction only. The principal arrival runway is Runway 35R, while

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Runway 35L is predominately used for departures. In certain instances, both runways may be used for arriving and departing aircraft.

6.2 Visibility Reporting. ATC will coordinate with airport operations when lowering ceiling and visibility conditions indicate that visibility less than RVR 1200 is imminent and SMGCS procedures are going into effect. Airport operations will in turn advise the airlines, service companies, other airport tenants, and air cargo operators by telephone. Individual airlines will notify service companies or vendors, which are not notified by airport operations, that the SMGCS plan is in effect. These procedures are terminated by ATC when no longer deemed necessary due to prevailing weather conditions. ATC will also advise airport operations when the SMGCS plan is no longer required, and airport operations will advise the airport tenants and other organizations noted above that the SMGCS plan is no longer in effect. The airlines will make appropriate notifications when the SMGCS plan has been terminated.

6.3 Departures. Each airline or aircraft operator is responsible for positioning aircraft at the movement area boundary. This may be accomplished with a tug, signalman, follow-me vehicle, or other appropriate means, including unassisted taxi, if visibility on the apron permits. When established at the movement area boundary, the aircraft will contact ATC ground control for taxi instructions. ATC may provide RVR readings to pilots prior to taxiing in the movement area. When visibility is less than RVR 1200, down to and including RVR 1200, all taxiway lighting may be illuminated. Taxiway edge lights, without centerline lighting, may be illuminated at various times for snow removal or other operational reasons. The FAA ground controller may use ASDE or pilot position reports to monitor the aircraft position prior to its entry into the movement area. The controller will then provide taxi instructions and traffic advisories appropriate to the route. The north-south parallel taxiways in the movement area are operated in opposing directions, with Taxiways G and L used as the primary departures taxiways to Runways 35L and 35R, respectively.

6.4 Departure Routings. Aircraft routings for departure will vary depending on the initial location of the aircraft and whether deicing is required prior to departure. Aircraft must have ATC clearance prior to entering Taxiway G, Taxiway L, or Taxiway M.

(1) Runway 35L Departures.

a. Aircraft departing on Runway 35L from the concourse apron proceed west on the lighted apron taxiways to Taxiway G, and continue north on Taxiway G to Taxiway CN. Aircraft proceed west on Taxiway CN and continue west onto Taxiway F1 to reach Runway 35L. ATC may require aircraft taxiing on Taxiway G to hold at the intersection of Taxiway CN. If deicing is required from a concourse deicing pad prior to departure, aircraft will proceed west on the apron taxiway to Taxiway H and turn north or south on Taxiway H to the assigned deicing pad. Upon completion of deicing, the aircraft must contact ATC for clearance to proceed onto Taxiway G.

b. Aircraft departing on Runway 35L from the south air cargo apron proceed east on the cargo Taxiway SC to Taxiway SA, and south on Taxiway SA to Taxiway A. Aircraft then proceed east on Taxiway A to the Runway 35R holding position movement area boundary marking, where contact is established with ATC. Aircraft continue east on Taxiway

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A to Taxiway M, north on Taxiway M to Taxiway CN, west on Taxiway CN, then onto Taxiway F1 to reach Runway 35L. ATC may require periodic position reports along the taxi route to confirm or supplement ASDE-III information. If deicing is required prior to departure, aircraft proceed east on Taxiway SC to Taxiway SA, south on Taxiway SA to Taxiway A, then east on Taxiway A to the south deicing pad. Upon completion of deicing, aircraft exit the pad at the intersection with Taxiway M and proceed as described in subparagraph 6.4(1)a. Should the aircraft require secondary deicing from a concourse deicing pad prior to departure, the pilot should advise ATC and request clearance to the concourse deicing pad area. Coordination between aircraft on the south air cargo apron and ATC is required to insure that conflicting (i.e., opposite direction traffic flows) do not occur on Taxiway M. Aircraft on the south cargo area should advise ATC prior to taxi.

c. Aircraft departing on Runway 35L from the general aviation area proceed north on Taxiway M to Taxiway CN, west on Taxiway CN onto Taxiway F1 to reach Runway 35L. Departures must contact ATC for taxi clearance before leaving the general aviation ramp. ATC may require aircraft to hold on the ramp prior to entering Taxiway M, when exiting on Taxiway M, or when reporting clear of the Runway 35R approach area located between Taxiway M5 and Taxiway M6. If deicing is required prior to departure, the pilot should request ATC clearance to the concourse apron deicing area.

(2) Runway 35R Departures.

a. Aircraft departing on Runway 35R from the concourse apron proceed east on lighted apron taxiways to the Taxiway L holding position (movement area boundary) marking. Prior to entering the movement area, the aircraft should contact ATC for taxi instructions. Aircraft will proceed southbound on Taxiway L. ATC may require aircraft taxiing on Taxiway L to hold at apron taxiway intersections for sequencing. Aircraft will continue south on Taxiway L to its intersection with Taxiway AA, east on Taxiway AA to Taxiway M, and then south on Taxiway M to Taxiway A, continuing east on Taxiway A to reach Runway 35R. If deicing is required at the south deicing pad, the aircraft proceeds south on Taxiway M to Taxiway SC, then west on Taxiway SC, south on Taxiway SA, and east on Taxiway A into the south deicing pad. Upon completion of deicing, ATC clearance is required prior to reentering the movement area at Taxiway M. Aircraft exit the deicing pad on Taxiway M, proceed north on Taxiway M to its intersection with Taxiway A, and turn eastbound on Taxiway A, continuing east on Taxiway A to reach Runway 35R.

b. Aircraft departing on Runway 35R from the south air cargo apron proceed east on cargo Taxiway SC to Taxiway SA, and south on Taxiway SA to Taxiway A. Aircraft then proceed eastbound on Taxiway A to the Taxiway M holding position (movement area boundary) marking where contact is established with ATC. Aircraft continue east on Taxiway A to reach Runway 35R. If deicing is required prior to departure, aircraft will follow the same routing on Taxiway A into the south deicing pad. Upon completion of deicing, aircraft exit the deicing pad and immediately contact ATC prior to entering Taxiway M for clearance on Taxiway A to Runway 35R.

c. Aircraft departing on Runway 35R from the general aviation area proceed south on Taxiway M and follow the same routing as described in paragraph 6.4(2)a.

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Departures must contact ATC for taxi clearance before leaving the general aviation ramp. ATC may require aircraft to hold on the ramp prior to entering Taxiway M. If deicing is required prior to departure, aircraft will follow the same routing on Taxiway M into and out of the south deicing pad as described in paragraph 6.4(2)a.

d. When departure and arrival operations are conducted on Runway 35R, Taxiway CN is used in a westbound direction favoring arrivals. Departures going to Runway 35R from the north side of Concourse C proceed west on Taxiway CN to Taxiway H, south on Taxiway H to the apron taxiway designated by ATC for transition east to Taxiway L, and then south on Taxiway L as described in paragraph 6.4(2)a.

6.5 Arrivals. Landings may be conducted on Runway 35L or Runway 35R. The apron taxiways are operated in an alternating east and west flow pattern to minimize taxi time to the gate. Taxiways F and M are used as the primary arrival taxiways. When visibility is less than RVR 1200, down to and including RVR 600, all taxiway lighting may be illuminated. Taxiway edge lights without centerline lighting may be illuminated at various times for snow removal or other operational reasons. At various times, ATC may ask arriving aircraft to report “clear” of the runway or ILS-critical area.

6.6 Arrival Routings. Aircraft arrival routings vary depending on the particular runway used for arrival, the airfield-operating configuration and the destination of the aircraft on the airport.

(1) Runway 35R Arrivals.

a. Aircraft arriving on Runway 35R will use mid-field Taxiways M6 or M7 to exit the runway, or continue to roll out to the end of the runway (Taxiway M10). Upon exiting the runway, aircraft will use Taxiway M to go north to the assigned apron taxiway to access the concourse apron, or to access Taxiway L to go south to the general aviation area or the south cargo area. ATC may require aircraft taxiing south on Taxiway L to hold at apron taxiway intersections. Aircraft exiting at the end (Taxiway M10) and going to the general aviation area or the south cargo area, will continue south on Taxiway L to Taxiway AA, proceed east on Taxiway AA to Taxiway M and southbound on Taxiway M. ATC may require aircraft taxiing on Taxiway L to hold at apron taxiway intersections. Aircraft accessing the south cargo area will use cargo Taxiway SC west from the intersection with Taxiway M. ATC may require aircraft taxiing west on Taxiway SC to report “clear” of Taxiway L. Upon receipt of an appropriate ATC clearance, aircraft exiting on Taxiways M6 and M7 may immediately turn south on Taxiway M to access the south air cargo apron or general aviation area. The taxiway routing from Taxiways M6 and M7 south to the south air cargo apron or general aviation area is as described above.

(2) Runway 35L Arrivals.

a. Aircraft arriving on Runway 35L will use mid-field Taxiway F9 to exit the runway, or continue to roll out to the end of the runway (Taxiway F12). Upon exiting the runway, aircraft will use Taxiway F to go south to Taxiway Z. Aircraft proceed east on Taxiway Z to Taxiway L. Access to the concourse apron, general aviation, and south cargo

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area on Taxiways L and M is conducted as described above. ATC may require aircraft taxiing southbound on Taxiway L to hold at intersecting apron taxiways.

6.7 Mixed operations. Effective air traffic management (ATM) coordination is essential when departures are conducted on Runway 35R in mixed operations. ATC should ensure that arrivals and departures originating and terminating in the south cargo area are managed to prevent congestion (i.e., “nose-to-nose operation”) on Taxiway M. All aircraft departing the south cargo area should contact ATC prior to entering the movement area on Taxiways A or SC. When mixed operations are being conducted on Runway 35L, aircraft arriving or departing Runway 35L will use the routings as described above.

7.0 AIRLINE PROCEDURES DURING LOW VISIBILITY CONDITIONS

7.1 General. Pilots conducting low visibility operations at ____ are required to have a copy of the low visibility taxi route chart. Low visibility taxi routes are depicted on the appropriate National Ocean Service (NOS) and Jeppesen charts. The airport apron controller will resolve aircraft and vehicle movement conflicts in the non-movement area. This will be accomplished through the use of two-way radio communication, ground movement control procedures, follow-me vehicles, and ground marshalling. ATC will monitor and control aircraft in the movement area.

7.2 Departures. Departing aircraft will follow company procedures for pushback, engine start, and initial taxi to the movement area boundary at the apron taxiway holding position. If appropriate, the pilot should request from the ground-handling agency taxiing assistance such as signalman and wing walkers, follow-me service, or towing to the apron taxiway holding position. In all cases, aircraft must have ATC clearance prior to entering the movement area.

7.3 Arrivals. Arriving aircraft will follow company procedures for taxi to the gate on the apron concourse or to other parking areas as appropriate. The airline assumes control of the aircraft in the vicinity of the gate and provides aircraft docking by the use of signalman and wing walkers, follow-me service, towing or other appropriate means as set out in the airline’s operating instructions.

7.4 Taxi Routing. The principal taxi flow direction on the parallel taxiways between concourses in the concourse apron area is from east to west. This direction is established on the basis that Runway 35R is predominately an arrival runway in low visibility conditions while Runway 35L is predominately used for departures. The westbound flow provides for arrivals on the east airfield to flow into the concourses to the aircraft parking position and out the other side to the west airfield for departure. When Runway 35L is used for mixed operations or as an arrivals-only runway, aircraft are routed east on Taxiway Z to the east north-south taxiway complex and enter the concourse apron area from the east, thereby retaining the westbound direction of flow between adjacent concourses. During the limited periods when Runway 35R is used for departures, an adjustment is made to the westbound flow direction so that all aircraft exiting the concourse apron area can more readily access Runway 35R for departure. The southern taxiway of the two taxiways between parallel concourses is routed in an eastbound direction. This routing effects the flow direction of

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Taxiway AA, Taxiway AN, and Taxiway BN, which are used to access Taxiway L. All other taxiways in the concourse apron area maintain the westbound flow direction.

8.0 RESPONSIBILITIES

8.1 Airport Operator.

(1) Serve as the point of contact (POC) for the SMGCS plan, hold meetings of the SMGCS WG, and maintain documentation of proceedings.

(2) Coordinate a review of the SMGCS plan and airfield activities on at least an annual basis, and amend, publish, and distribute the initial and revised SMGCS plan.

(3) Monitor adherence to the sections of the SMGCS plan that are under the airport's control and take action to correct deficiencies.

(4) Conduct inspections, report failures, and provide maintenance of lighting aids associated with the SMGCS plan.

8.2 ATC Tower.

(1) Initiate and terminate the SMGCS procedures specified in paragraph 6, Air Traffic Control Procedures.

(2) Coordinate with the airport operations department prior to implementing the SMGCS plan.

(3) Provide directional assistance to ARFF units and other emergency equipment responding during an emergency in low visibility conditions.

(4) Monitor and control aircraft and vehicles in the movement areas.

(5) Develop and coordinate the low visibility taxi route(s) chart(s) with the regional Air Traffic Division and FAA Headquarters (HQ) Air Traffic Rules and Procedures Service (ATP), Terminal Procedures Branch (ATP-120).

8.3 Airport Tenants.

(1) Participate in the SMGCS WG and disseminate low visibility procedures to company employees.

(2) Train personnel in low visibility procedures.

(3) Enforce SMGCS plan driving procedures and, if authorized, conduct driver training.

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(4) Assure adherence to the sections of the SMGCS plan that are under airport tenant control, and take action to correct deficiencies.

8.4 Military Tenants.

(1) If required, request follow-me service from airport operations when the SMGCS plan has been implemented.

9.0 PLANS AND MILESTONES

9.1 Near-Term.

(1) Install runway guard lights at all runway/taxiway intersections.

(2) Ensure complete training of all personnel involved with the SMGCS plan.

(3) Coordinate and publish a low visibility taxi route chart.

9.2 Long-Term. Consider the application of new ARFF technology and snow removal equipment to operate in low visibility conditions.

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VOLUME 4 AIRCRAFT EQUIPMENT AND OPERATIONAL AUTHORIZATIONS

CHAPTER 2 ALL WEATHER TERMINAL AREA OPERATIONS

Section 5 Nonprecision, Approach Procedures with Vertical Guidance, and Category I Precision Approach and Landing Operations

4-267 OVERVIEW. This section includes guidance for operations other than Category (CAT) II/III approaches for Title 14 of the Code of Federal Regulations (14 CFR) parts 91, 91 subpart K (part 91K), 121, 125, 129, and 135 operators. Approach and landing operations other than CAT II/III include visual approaches, contact approaches, circling approaches, Nonprecision Approaches (NPA), approach procedures with vertical guidance (APV), and CAT I instrument landing system (ILS) approaches. This section includes guidance for both approach procedures using ground-based and/or satellite-based Navigational Aids (NAVAID).

4-268 APPLICABILITY. The information detailed in this chapter applies to the operators of all civil aircraft operating under parts 91, 91K, 121, 125, 129, and 135. This section addresses concepts and national policy guidance to be used by an aviation safety inspector (ASI) when evaluating, approving, or denying requests for an authorization to conduct any terminal area approach operation other than CAT II/III operations. Requests for CAT I operations other than those based on ILS, such as a Ground Based Augmentation System (GBAS) Landing System (GLS), are to be directed to the regional Flight Standards division (RFSD) Next Generation (NextGen) Branch (AXX-220). This section does not apply to Special Authorization (SA) CAT I instrument procedures. See Volume 4, Chapter 2, Section 6 for SA CAT I approvals.

4-269 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Title 14 CFR parts 91, 97, 119, 121, 125, 129, and 135.
- Federal Aviation Administration (FAA) Order 1050.1, Environmental Impacts: Policies and Procedures.
- FAA Order 6750.24, Instrument Landing System and Ancillary Electronic Component Configuration and Performance Requirements.
- FAA Order JO 7110.65, Air Traffic Control.
- FAA Order 8260.49, Simultaneous Offset Instrument Approach (SOIA).
- FAA Order 8400.13, Procedures for the Evaluation and Approval of Facilities for Special Authorization Category I Operations and All Category II and III Operations.
- Advisory Circulars (AC) 97-1, Runway Visual Range (RVR).
- AC 120-29, Criteria for Approval of Category I and Category II Weather Minima for Approach.
- AC 120-57, Surface Movement Guidance and Control System.
- AC 120-71, Standard Operating Procedures for Flight Deck Crewmembers.
- AC 25-7, Flight Test Guide for Certification of Transport Category Airplanes.
- AC 120-67, Criteria for Operational Approval of Auto Flight Guidance Systems.
- Technical Standard Orders (TSO).

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- U.S. Flight Information Publications (FLIP).
- Instrument Procedures Handbook (IPH).
- Aeronautical Information Manual (AIM).

B. Forms. None.

C. Job Aids. None.

4-270 DEFINITIONS.

A. Approach Procedures with Vertical Guidance (APV). APV approach and landing operations are three-dimensional operations conducted under IFR that provide both lateral and vertical guidance, but that do not meet all of the accuracy requirements and navigation specifications to be classified as CAT I precision approaches. APV operations are conducted using decision altitude/height (DA/H). Examples of APV approaches include Area Navigation (RNAV) (lateral approach procedures with vertical guidance (LPV) or lateral navigation (LNAV)/vertical navigation (VNAV) minimums) and localizer-type directional aid (LDA) with glideslope (GS).

B. Category (CAT) I Operations. CAT I operations are defined as precision approach and landing operations conducted under instrument flight rules (IFR) using CAT I operating minimums. CAT I operating minimums consist of a specified IFR decision altitude (DA)/decision height (DH) that is not lower than the equivalent of 200 feet (60 meters) above the touchdown zone (TDZ), and a visibility or a Runway Visual Range (RVR) that is not lower than one-half statute mile or RVR 1800, respectively.

C. Nonprecision Approach (NPA) and Landing Operations. NPA and landing operations are two-dimensional operations conducted under IFR using lateral guidance but not vertical guidance. Very high frequency (VHF) omnidirectional range (VOR), non-directional radio beacon (NDB), LDA, Localizer (LOC), Localizer back course (LOC-BC), RNAV, LNAV minimums or initial RNAV distance measuring equipment (DME)-DME approaches), and airport surveillance radar (ASR) approaches are examples of NPAs. Nonprecision operations are conducted using a minimum descent altitude (MDA) and a specific missed approach point (MAP).

D. Precision Approach and Landing Operations. Precision approach and landing operations are three-dimensional operations conducted under IFR using ILS or GLS, which provides both lateral and vertical guidance. Precision operations are conducted using a DA/H, or which have no DA/H and support operation to touchdown. GLS operations use a Local Area Augmentation System (LAAS) or GBAS to augment the standard Global Positioning System (GPS) signal for more precise navigational guidance.

E. Special Authorization (SA) CAT I. FAA Order 8400.13 authorizes SA CAT I approaches to a radio altimeter (RA) decision height (DH) as low as 150 feet and a visibility minimum as low as RVR 1400 to runways that do not have TDZ or runway centerline (RCL) lighting when the approach is flown using an aircraft with a Head-Up Display (HUD) to DH.

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The process for approving or denying SA CAT I authorization is found in Volume 4, Chapter 2, Section 6.

4-271 APPROVAL METHOD.

A. Part 91. Part 91 operators do not need a letter of authorization (LOA) for any other than CAT II/III (which includes SA CAT I) authorizations described in this section. Precision runway monitor (PRM) approaches do not require a specific LOA, but the operator must adhere to the criteria prescribed on the "Attention All Users" that accompanies each PRM approach.

B. Parts 91K, 121, 125, 129, and 135. A part 91K program manager is issued management specifications (MSpecs); parts 121, 125, 129, and 135 operators are issued operations specifications (OpSpecs); and a part 125 operator holding a Letter of Deviation Authority (LODA) is issued an LOA for operations described in this section. Volume 3, Chapter 18, Section 5 contains guidance for each of these authorizations, except for part 129, which is in Volume 12, Chapter 2, Section 5. (See Table 4-7, Available OpSpec/MSpec/LOA Paragraphs by 14 CFR Part.)

1) C051. C051 is issued to all operators conducting airplane operations under parts 91K, 121, 125 (including part 125 LODA holders), 129, and 135 who conduct any terminal flight operations under IFR.

2) C052. C052 is applicable to all operators conducting airplane operations under parts 91K, 121, 125 (including part 125 LODA holders), 129, and 135. Paragraph C052 specifies the types of instrument approaches the operator is authorized to conduct under IFR and prohibits the use of other types of instrument approaches, and authorizes the lowest straight-in nonprecision, APV, and CAT I precision approach and landing minimums.

3) C054. C054 is issued to all operators conducting operations under parts 121, 125 (including part 125 LODA holders), and 129. It is also issued to operators who conduct turbine-powered airplane operations under part 135. It is not issued to part 135 operators who do not operate turbine-powered airplanes unless that operator also conducts operations under part 121. C054 specifies the RVR landing minimum equivalent to the published RVR landing minimum that must be used by high-minimum pilots (less than 100 hours in aircraft type). It also specifies that before a pilot in command (PIC) of a turbojet can conduct an instrument approach with visibility conditions reported to be below three-quarters of a mile or RVR 4000 (basic turbojet landing minimums), the pilot must be specifically qualified and authorized to use standard landing minimums.

4) C061. C061 authorizes an operator to use a flight control guidance system with automatic landing capabilities to touchdown in conditions other than CAT II/III. Part 121, § 121.579(c) and part 135, § 135.93(d) specify that this type of operation must be authorized by OpSpecs. C061 is optional for parts 91K, 121, 125, and 135.

5) C062. OpSpec/MSpec C062 is optional for part 91K, 121, 125, and 135 operations to authorize operators to use manually flown flight control guidance systems to conduct approach and landing operations to fly a CAT I ILS using a Head-Up-Guidance System (HGS).

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6) C064. C064 authorizes an operator to conduct nonscheduled passenger and all-cargo (scheduled and nonscheduled) terminal area IFR operations in Class G airspace or into airports without an operating control tower.

7) C073. C073 authorizes operators to use DA in lieu of MDA on certain NPA procedures. These procedures must meet specific criteria to verify that the visual approach area is clear of obstacles and will safely permit a brief descent below DA.

8) C075. OpSpec C075 is issued to operators who conduct parts 91K, 121, 125 (including part 125 LODA holders), 129, and 135 operations with fixed-wing airplanes. OpSpec C075 specifies the lowest minimums that can be used for CAT I circling approach maneuvers. It also provides special limitations and provisions for instrument approach procedures (IAP) at foreign airports. For part 129, OpSpec C075 also authorizes contact approaches.

9) C077. C077 is an optional authorization that is applicable to all operators conducting operations under the provisions for part 135 on-demand turbojet and all parts 121 and 129 foreign operators (except for rotorcraft operations). OpSpec B051 is applicable for parts 121 and 129 visual flight rules (VFR) en route operations for propeller-driven aircraft and may be issued in conjunction with C077.

10) C080. C080 is used to authorize terminal area IFR operations for scheduled passenger operations in Class G airspace or at airports without an operating control tower.

Table 4-7. Available OpSpec/MSpec/LOA Paragraphs by 14 CFR Part

Paragraph	91K	121	121/135	125	125 LODA Holders	129	135
C051	✓	✓	✓	✓	✓	✓	✓
C052	✓	✓	✓	✓	✓	✓	✓
C054		✓	✓	✓	✓	✓	✓
C061	✓	✓	✓	✓			✓
C062	✓	✓	✓	✓			✓
C064		✓	✓	✓	✓		✓
C073	✓	✓	✓	✓	✓		✓
C075	✓	✓	✓	✓	✓	✓	✓
C076	✓	✓	✓	✓			✓
C077		✓	✓			✓	✓
C080		✓	✓			✓	✓

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4-272 GENERAL.

A. Areas of Operation. Nonprecision, APV, and CAT I precision approaches can be conducted at controlled and uncontrolled airports. All of these approaches can be conducted under IFR in visual or instrument flying conditions. Visual approaches are conducted with reference to the airport and/or the proceeding aircraft. Contact approaches are conducted with visual reference to the terrain. The circling maneuver of an NPA is conducted with visual reference to the airport. Straight-in NPAs, circling approaches down to the MDA, and CAT I ILS approaches may be conducted in instrument flying conditions.

B. Landing Minimums. Landing minimums for other than CAT II/III approaches are generally addressed by part 91, § 91.175, and §§ 121.651, 121.652, 135.225, and standard or special OpSpecs Part C. The published minimums on a part 97 instrument approach reflect these requirements.

C. CAT I Terminology. The CAT I terminology used in this section is based on and consistent with U.S. OpSpecs for parts 121, 125, 129, and 135 operators. AC 120-29 is being amended to reflect this definition. While there are slight variations with International Civil Aviation Organization (ICAO), the broad objectives and practical operational applications are similar. For U.S. applications to parts 121, 125, 129, and 135 operators, CAT I is considered to include any ILS, GLS, or precision approach radar (PAR) IAP having minimums not less than 200 feet height above touchdown (HAT) and RVR not less than 1,800 feet. SA CAT I procedures have approach minimums as low as 150 feet DA/DH and RVR 1400. Approval for these procedures requires special equipage and training, which is discussed in Volume 4, Chapter 2, Section 6. In certain circumstances, usually related to training, the FAA and industry commonly refer to CAT I procedures as precision approaches and the other-than-CAT I procedures as NPAs. These terms are used below when describing CAT I operations.

D. DA/DH. For APV and CAT I precision approaches, a DA/DH is typically specified. The DA/DH presents the minimum altitude in an approach to which descent may continue, or by which a missed approach must be initiated, if the required visual reference to continue the approach has not been established. The DA/DH altitude value is typically measured by a barometric altimeter and is the determining factor for an ILS approach procedure. The height value specified in parentheses is typically a radio or radar altitude equivalent height above the TDZ (HAT) used only for advisory reference, and it does not necessarily reflect actual height about the underlying terrain. The height value in the DA/DH will be in reference to the height above threshold (HATh) for approaches with minimums calculated after August 2010.

E. Minimum Descent Altitude/Height (MDA/H). The minimum heights or altitudes for IAPs that do not have vertical guidance are specified as an MDA/H. For straight-in minimums, the MDA is a barometric altitude (above mean sea level (MSL)) with a specific HAT zone. The height value in the MDA/H will be in reference to the HATh for approaches with minimums calculated after August 2010. For circling minimums, the MDA is a barometric altitude with a specific height above airport (HAA). The height value specified in parentheses is the minimum descent height (MDH), which is typically a radio or radar altitude height equivalent to the HAT for straight-in minimums or HAA for circling minimums. The MDH is

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used only for advisory reference, and it does not reflect actual height above the underlying terrain.

F. Straight-In Minimums for Approaches with a DA. The lowest permissible minimums for Categories A, B, C, and D aircraft during the conduct of straight-in IAPs that have a DA are HAT 200 and one-half statute mile visibility or RVR 1800. The lowest permissible minimums for helicopters operated at 90 knots or less are HAT 200 and one-fourth statute mile visibility or RVR 1200. These minimums for helicopters operated at more than 90 knots are HAT 200 and one-half statute mile visibility or RVR 1800. These minimums are the lowest authorized for approaches that have a DA and are restricted to runways that are equipped with a runway TDZ and RCL lighting and either a medium intensity approach lighting system with runway alignment indicator lights (MALSR), simplified short approach lighting system with runway alignment indicator lights (SSALR), Approach Lighting System with Sequenced Flashing Lights (ALSF)-1, or ALSF-2 approach lighting systems, or foreign equivalents.

G. Straight-In Minimums for Approaches with a MDA. The lowest permissible minimums for Categories A, B, C, and D aircraft during the conduct of straight-in IAPs that have a MDA are HAT 250 and one-half statute mile visibility or RVR 2400. The lowest permissible minimums for helicopters operated at 90 knots or less are HAT 250 and one-fourth statute mile visibility or RVR 1600. These minimums for helicopters operated at more than 90 knots are HAT 250 and one-half statute mile visibility or RVR 2400. These minimums are the lowest authorized for approaches that have a MDA and are restricted to runways that are equipped with an MALSR, SSALR, ALSF-1, or ALSF-2 approach lighting systems, or foreign equivalents.

4-273 OPERATIONAL AUTHORIZATION.

A. Straight-In Approach and Landing Operations. Before an operation can be authorized for the use of straight-in IAPs that have either an MDA or a DA/DH, inspectors must evaluate the proposed operation and determine that the operator is competent to safely conduct those procedures. Inspectors must ensure that the operator's program specifies the conditions necessary for the safe conduct of proposed operations. The operator's program should incorporate systems, methods, and procedures that meet the following criteria:

- Program restricts operations to aircraft that are properly equipped and Airworthy for the straight-in approaches to be conducted.
- Complies with regulatory requirements specified for the operations.
- Meets the requirements of Parts B, C, and H of the OpSpecs and the criteria of this order.
- Provides for accepted safe operating practices, such as altitude awareness and sterile cockpit procedures.
- Meets the criteria of AC 120-29, when applicable.
- Requires the use of the stabilized approaches when turbojet, turbofan, or propfan airplanes are used.

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- Program restricts operations to pilots who are properly trained, experienced, qualified, and proficient for the particular operation being conducted (including use of basic air carrier minimums as well as standard minimums).
- Program restricts operations to airports and runways that meet the requirements applicable to straight-in instrument approaches.

B. Approaches Requiring Circling Maneuvers. When an operator is authorized to conduct instrument approaches, the OpSpecs automatically authorize the conduct of circling maneuvers in VFR weather conditions (1,000-foot ceiling and 3-statute mile visibility). A circling maneuver conducted under this authorization may be performed at the published HAA appropriate for the highest speed in the circling maneuver. However, before circling maneuvers can be conducted with ceilings below 1,000 feet and/or visibilities below 3 statute miles, the operator's approved training program must provide for training in the circling maneuver. If an operator intends to conduct circling maneuvers with ceilings below 1,000 feet and/or visibilities below 3 statute miles, inspectors must evaluate the operator's training program and determine that it provides adequate instruction and checking of pilots on the circling maneuver. When an operator does not provide training on circling maneuvers, the operator's operating policies and procedures must prohibit circling maneuvers when ceilings and/or visibilities are below 1,000 feet and 3 statute miles. Inspectors must also ensure that the certificate holder's overall program specifies the necessary conditions (over and above those required for straight-in approaches) to safely conduct circling maneuvers. The operator's program should incorporate methods, procedures, and training that meet the following criteria:

- Meets the circling maneuver criteria in the OpSpecs.
- Requires the circling maneuver to be performed in visual flight conditions.
- Provides for safe missed approaches throughout the circling maneuver.
- Requires the use of circling maneuver minimums appropriate to the highest speed used in a particular circling maneuver.
- Program restricts operations to those airports and runways where circling maneuvers can be safely completed.
- Program restricts circling maneuvers with ceilings below 1,000 feet and/or visibilities below 3 statute miles to those pilots who are properly trained and checked for the circling maneuver in those weather conditions.

1) No part 135 certificate holder authorized to conduct operations under IFR shall use, nor may any PIC execute, a circling approach maneuver to minimums published in the IAP for the circling approach maneuver or the minimums specified in the chart in OpSpec C075, whichever is higher, unless that PIC has (within the last 6 months, or as required by an Advanced Qualification Program (AQP)) satisfactorily demonstrated the circling approach maneuver to published minimums to an approved check airman or the Administrator.

2) For part 121, if the operator does not provide flight training and flight checking on the circling approach maneuver in accordance with part 121 appendices E and F, respectively, then the operator's General Operations Manual (GOM) and the manuals used by the flightcrews must specifically prohibit conducting circling approach maneuvers when reported weather conditions are below 1000-3 (ceiling and visibility).

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3) Ground training must include instruction on procedures to be used to ensure that missed approaches executed during a circling approach maneuver will be conducted safely.

4) See OpSpec C075 for details on the training and checking requirements for the circling approach maneuver authorization for all certificate holders.

C. Operator Manuals. Before granting approval by issuing OpSpecs, inspectors must evaluate the ability of the operator's overall program to provide the policy guidance, methods, and procedures necessary for ensuring the safe conduct of instrument approach operations using basic air carrier operating minimums. In conducting this evaluation, inspectors must consider certain factors related to the manuals. After completing this evaluation, the inspector must make a judgment concerning whether the operator's program as described in its manuals is able to meet the 14 CFR and OpSpecs requirements. Inspectors must also make a judgment concerning the operator's ability to provide for safe, accepted operating practices and procedures. When conducting this evaluation and making an appropriate judgment, the inspector should consider the following factors:

- Criteria and procedures for determining the suitability of runways, airport facilities, services, and ground-based equipment necessary for the types of aircraft used and the CAT I operation to be conducted.
- Criteria and procedures for determining the airborne equipment required to be serviceable at departure.
- Criteria and procedures for determining the airborne and ground-based equipment that must be serviceable before conducting CAT I operations at the destination and alternate airports.
- Criteria and procedures for determining the airworthiness status of the aircraft for the operation to be conducted.
- Criteria and procedures to ensure that the minimum equipment list (MEL) requirements are met for the operation being conducted.
- Criteria and procedures that ensure that CAT I dispatch or flight release requirements are met.
- Criteria and procedures for determining the instrument procedures and operating minimums authorized, including the equipment, training, and qualification requirements necessary for conducting the operations.
- Specific and detailed operating procedures and crew duty assignments for the types of aircraft used and the IAPs authorized. (These policies and procedures must require all turbojet operations to be conducted in accordance with the "stabilized approach" concept.)
- Specific requirements and instructions concerning the operating restrictions and limitations associated with the types of aircraft and the IAPs to be used.

D. The Operator's Training Program. Inspectors must evaluate training programs to determine that flightcrews receive both ground and flight training on the instrument approaches the operator is authorized to conduct. Because of procedural and design similarities, flight training on one type of IAP often provides the necessary training for other types of IAPs. Inspectors observing training in progress should verify that the approved training and

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qualification curriculum segments ensure flightcrew competency in the conduct of authorized IAPs.

E. Maintenance Program. Before approving an operator's proposal to use turbojet, turbofan, and/or propfan airplanes in All Weather Terminal Area Operation (AWTA) operations that use standard operating minimums, inspectors must ensure that the operator's approved airworthiness program includes the special airborne equipment required for the standard minimums. Close coordination with the principal maintenance inspector (PMI) and the principal avionics inspector (PAI) is essential before granting operational approval.

F. Authorizing Part 97 ILS CAT I. Principal operations inspectors (POI) authorize issuance of part 97 ILS CAT I operations via issuance of an OpSpec or LOA, as appropriate. The purpose of this task is for a principal inspector (PI) to authorize ILS CAT I operations.

1) For CAT I, unless a certificate-holding district office (CHDO) otherwise specifies that approach demonstrations are necessary due to unusual circumstances or special situations for special systems such as autoland, operators may conduct CAT I operations without need for special demonstrations if the aircraft type Aircraft Flight Manual (AFM) does not preclude the intended operation. This task is usually performed in a Flight Standards District Office (FSDO)/certificate management office (CMO).

2) The acceptable task performance is that applicants are issued the OpSpec (or a letter of disapproval of application for the OpSpec) in a timely manner, as appropriate to the content of the application and the qualifications of the applicant.

G. Proving and Validation Tests. Validation testing is not required if CAT I operations are evaluated during the aircraft proving tests required by part 121 or 135. Validation tests are required, however, if an operator has previously conducted VFR only operations and is proposing to conduct AWTA operations for the first time with existing aircraft. Validation tests may also be required when a part 135 operator or an applicant for a certificate proposes to conduct AWTA operations with an aircraft in which part 135 does not require that a proving test be conducted.

4-274 CONTINUOUS DESCENT FINAL APPROACH (CDFA). CDFA is a specific technique for flying the Final Approach Segment (FAS) of a nonprecision IAP as a continuous descent, without level-off, from an altitude/height at or above the final approach fix (FAF) altitude/height to a point approximately 50 feet (15 meters) above the landing runway threshold or the point where the flare maneuver should begin for the type of aircraft flown.

A. CDFA Operating Concept. The CDFA operating concept is to fly nonprecision IAPs as a continuous descent maintaining the published nominal vertical profile using VNAV guidance, altitude versus range (or DME) cross-checks, or altitude versus time cross-checks. The most critical aspect of CDFA is that the pilot executes a missed approach at the MDA plus an additive buffer altitude (to prevent descent below MDA) instead of leveling off at the MDA.

B. Near-Term Safety Benefits. Based on near-term safety benefits (controlled flight into terrain (CFIT)-reduction) of using stabilized-approach criteria on a continuous descent with a constant, pre-determined Vertical Path (VPATH) to the runway, and the desire to move to

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three-dimensional operations where possible, users have indicated their intent to apply the CDFA technique to nonprecision IAPs. Use of the CDFA technique will enhance landing safety by eliminating the potential vulnerability of two-dimensional approach operations and the use of stepdown fixes by providing a continuous descent to the runway. This both reduces exposure to unstabilized approaches that lead to inappropriate landing performance and reduces vulnerability to CFIT accidents.

4-275 PRM. The FAA began the Multiple Parallel Approach Program (MPAP) to research whether ILS approaches to parallel runways would improve capacity. The objective was to achieve improvements in airport arrival rates through the conduct of simultaneous, closely spaced parallel approaches. That objective is being met using PRM.

A. ILS/PRM and LDA/PRM Approaches. Where parallel RCLs are 4,300 feet apart or less, but no less than 3,000 feet, simultaneous ILS approaches may be conducted. Similarly, where parallel RCLs are 3,000 feet apart or less, but no less than 750 feet, simultaneous offset instrument approaches (SOIA) may be conducted with ILS approaches. Those approaches are labeled “ILS/PRM” and “LDA/PRM,” respectively, on instrument approach charts. Air traffic control (ATC) provides an air traffic controller using special PRM radar during these approaches. That controller is known as the final monitor controller.

B. The Breakout Maneuver. Working with industry, the FAA conducted extensive analysis of simulation data and determined that the implementation of PRM and SOIA approach operations to closely spaced parallel runways requires additional crew training. The primary focus of this training is to raise each pilot’s situational awareness in ILS/PRM and LDA/PRM operations. The breakout maneuver must be flown manually.

1) Traffic Alert. One important element of the additional training is the pilot’s understanding of the difference between a normal missed approach initiated by a pilot, and a breakout initiated by a PRM final monitor controller. It must be clear to flightcrews that the words “Traffic Alert,” when used by the final monitor controller, signal critical instructions that the pilot must act on promptly to preserve adequate separation from an airplane straying into the adjoining approach path.

2) ATC Breakout Maneuver Command to Turn and/or Descend, Climb, or Maintain Altitude. The flightcrew must immediately follow the final monitor controller’s vertical (climb/descend/maintain altitude) and horizontal (turn) commands. If the flightcrew is operating the Traffic Alert and Collision Avoidance System (TCAS) in the traffic advisory (TA)/Resolution Advisory (RA) mode and receives a TCAS RA at any time while following the final monitor controller’s command, the flightcrew will simultaneously continue to turn to the controller’s assigned heading and follow the vertical guidance provided by the TCAS RA.

3) Time-to-Turn Standard. Regardless of airplane type, tests and data analysis revealed that pilots normally passed through an angle of bank of at least 3 degrees while rolling into a breakout turn, within 10 seconds of receiving a breakout command. (Bank angles of between 20 and 30 degrees were normally achieved during the breakout.) The operator must show that its pilots can readily meet this time-to-initiate-turn standard prior to the POI authorizing ILS/PRM or LDA/PRM approaches in OpSpec/MSpec/LOA C052. Flightcrews are

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required to manually fly the breakout maneuver unless otherwise approved by the Air Transportation Division (AFS-200) (AFS-200 must have concurrence from the Flight Technologies and Procedures Division (AFS-400) to approve breakout in auto modes). The air carrier should demonstrate its ability to meet this standard by having representative pilots perform the breakout maneuver while the POI or the POI's designated representative observes. The demonstration should conform to procedures contained in the air carrier's approved operating manual for its flightcrews. The commercial operator should submit procedures to its POI for this authorization.

NOTE: In a breakout, ATC will never command a descent below the applicable minimum vector altitude, thus assuring that no flight will be commanded to descend below 1,000 feet above the highest obstacle during a breakout.

C. ILS/PRM, LDA/PRM, and the Use of TCAS. TCAS may be operated in TA/RA mode while executing ILS/PRM or LDA/PRM approaches. However, when conducting these operations, pilots must understand that the final monitor controller's instruction to turn is the primary means for ensuring safe separation from another airplane. Pilots must bear in mind that TCAS does not provide separation in the horizontal plane; TCAS accomplishes separation by commands solely in the vertical plane. Therefore, during final approach only the final monitor controller has the capability to command a turn for lateral separation. Flightcrews are expected to follow any ATC instruction to turn.

1) ATC Command to Turn with TCAS RA. In the unlikely event that a flightcrew should simultaneously receive a final monitor controller's command to turn and a TCAS RA, the flightcrew must follow both the final monitor controller's turn command and the TCAS RA's climb or descent command.

2) TCAS RA Alone. In the extremely unlikely event that an RA occurs without a concurrent breakout instruction from the final monitor controller, the pilot should follow the RA and advise the controller of the action taken as soon as possible. In this instance, it is likely that a breakout command would follow.

3) TCAS Not Required. An operative TCAS is not required to conduct ILS/PRM or LDA/PRM approaches.

D. Pilot Training. See Volume 4, Chapter 2, Section 5 for information on pilot training required prior to authorizing PRM approaches.

E. ILS/PRM and LDA/PRM Authorizations. Operators will be authorized ILS/PRM and/or LDA/PRM approaches in the OpSpec/MSpec/LOA C052 templates. Definitions of ILS/PRM and LDA/PRM have been added to the A002 template.

4-276 VISUAL APPROACH. OpSpec C077 authorizes an operator to conduct visual approaches, provided the conditions specified in the C077 are met. For operations at foreign airports, it is important to understand that the term "visual approach" can have a different meaning than the U.S. definition of visual approach. The ICAO definition of a visual approach includes a contact approach and does not include requirements to have VFR weather conditions, to be under the control of an ATC facility, or to be within 35 nautical miles (NM) of the

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destination airport. In both domestic and foreign operations, the operator must comply with the conditions specified in the OpSpecs when conducting visual approaches. When authorized to operate in foreign countries, the operator's policies, procedures, and approved training program must ensure that the requirements for visual approaches in foreign countries are adequately addressed.

4-277 CONTACT APPROACHES. Contact approaches, in accordance with OpSpec/MSpec C076, are authorized only when the operator's approved training program provides training on contact approaches. A contact approach is an authorization to deviate from the prescribed IAP (under IFR weather conditions) and to proceed visually to the runway of intended landing. Although the flight is still on an IFR flight plan and ATC maintains responsibility for the separation of aircraft and wake vortex requirements, the flightcrew does assume total responsibility for navigation, terrain, and obstacle avoidance. If an operator does not provide training on contact approaches, its policies and procedures must prohibit pilots from requesting, accepting, or conducting contact approaches. When an operator does provide training on contact approaches, the operator's operating policies and procedures must ensure that the conditions and requirements for accepting and conducting these approaches are clearly stated.

4-278 OTHER APPROACH OPERATIONS.

A. Airborne Radar and Offshore Approaches. An operator can be authorized to conduct Airborne Radar Approaches (ARA) and/or offshore standard approach procedures (OSAP). The operator's approved training program, equipment installations, and operational policies and procedures must meet the criteria specified in the current edition of AC 90-80, Approval of Offshore Standard Approach Procedures, Airborne Radar Approaches, and Helicopter En Route Descent Areas, before the operator can be authorized to conduct ARAs and OSAPs. ARAs and OSAPs are authorized by listing the procedure in OpSpec H113.

B. Helicopter En Route Descent Areas (HEDA). HEDAs permit a single instrument procedure to serve many offshore heliports, and significantly reduce the burden of developing numerous Standard Instrument Approach Procedures (SIAP) for this dynamic situation. This is particularly useful in offshore operations where heliports frequently exist for short periods of time and where the location of the heliport is frequently moved because of operational needs. Once the criteria specified in AC 90-80 have been met, HEDAs are authorized by being listed in OpSpec H104.

C. Point in Space (PinS) Approaches. In certain cases, the instrument portions of an IAP may deliver the aircraft to a predetermined PinS instead of to an airport or runway. These types of approaches are intended to provide an IFR descent to a point where sufficient visual reference is available for the pilot to navigate visually for several miles to the airport of intended landing. If the required seeing conditions are not established before passing this PinS, a missed approach can be safely executed. These procedures are useful in the following two situations:

1) Terrain, obstacles, conflicting air traffic, and/or navigation systems limitations can occasionally prevent the establishment of a standard IFR approach procedure to a particular airport or runway. In certain cases where this occurs, an instrument approach can be established to provide an IFR descent to a point a few miles from the airport. Upon arrival at this PinS, the

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flight can then proceed under VFR conditions using pilotage and/or station-referenced VFR Class I navigation to a landing at that airport.

2) These procedures are, in effect, an IAP followed by an extended visual segment. The approach procedure will contain the notation “fly visual to the airport.” In normal circumstances, an authorization to conduct approaches that have an MDA automatically authorizes the operator to conduct fly visuals in accordance with part 97 and the OpSpecs.

4-279 OPERATING MINIMUMS. The lowest operating minimums for operations conducted under parts 91K, 121, 125, 129, and 135 are specified in standard OpSpecs, MSpecs, or LOAs. In general, an operator is authorized to use operating minimums specified by the following groups of IAPs, provided the minimums are not lower than the lowest minimums specified in the air carrier’s OpSpecs/MSpecs/LOAs for any particular type of approach procedure.

- Part 97 IAP.
- U.S. military IAPs at U.S. military airports.
- Any IAPs approved and incorporated in the OpSpecs/MSpecs/LOAs.
- ICAO contracting state IAPs at foreign airports.
- IAPs established by an air carrier at foreign airports, provided the procedure is accepted in accordance with the OpSpecs/MSpecs/LOAs.

4-280 CONTROLLING MINIMUM CONCEPT. The concept of a controlling minimum is based on reported weather conditions at the destination airport. The controlling minimum concept includes considerations for the reported weather conditions, the capabilities of the flightcrew, and the capabilities of the airborne and ground- or space-based equipment. This concept prohibits a pilot from continuing past the FAF, or beginning the FAS of an IAP unless the reported visibility (RVR, if applicable) is equal to or greater than the authorized visibility (RVR) minimum for that IAP. The basic objective of the controlling minimum concept is to provide reasonable assurance that once the aircraft begins the FAS, the pilot will be able to safely complete the landing. The controlling minimum concept, however, permits a pilot to continue a CAT I approach to DA/DH if the visibility/RVR was reported to be at or above the controlling minimum when the pilot began the FAS even though a later visibility/RVR report indicates a below-minimum condition. RVR reports, when available for a particular runway, are the reports (controlling reports) that must be used to determine whether an approach to, and landing on, that runway are authorized or prohibited.

A. Parts 91 and 91K Controlling Minimum. The controlling minimums concept as described above is not applicable to part 91 or 91K operators when determining if the pilot can continue past the FAF or begin the FAS. Parts 91 and 91K operations can begin an approach and continue to the DA/DH or the MDA and the MAP, even when the weather conditions are reported to be below the authorized IFR landing minimums. Upon arrival at the MDA and before passing the MAP, or upon arrival at the DA/DH, the approach may be continued below DA/DH or MDA to the runway if the seeing conditions required by § 91.175(c)(d) or § 91.175(1) are met.

B. Part 121 Controlling Minimum. The controlling minimum concept for operations conducted under part 121 is implemented by § 121.651(b). For these operations, the controlling

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minimum must be used at civilian airports within the United States and its territories, and at U.S. military airports, unless the provisions of § 121.651(d) are met. Section 121.651(d) permits a pilot to begin the FAS even though the reported visibility/RVR is below the controlling minimum if the approach procedure is an ILS and the flight is actively monitored by a PAR. Therefore, pilots are not constrained by the controlling minimum on runways with ILS and active PAR facilities, provided the provisions of § 121.651(d) are met. The controlling minimum concept allows for a pilot to continue a CAT I approach to DA/DH or MDA NPA if the visibility/RVR was reported to be at or above the controlling minimum when the pilot began the FAS, even though a later visibility/RVR report indicates a below-minimum condition. Upon reaching DA/DH or MDA and before passing the MAP, the approach may be continued below DA/DH or MDA to touchdown if the requirements of § 121.651(c) are met even though the visibility/RVR is reported to be below the controlling minimum.

C. Parts 125 and 135 Controlling Minimum. The controlling minimum concept for parts 125 and 135 differs in application from part 121. Part 91 applies to all parts 125 and 135 operations whether they are conducted in foreign countries or the United States (see part 125, § 125.23(b) and § 135.3(b)). Operations conducted under parts 125 and 135 must also be in compliance with §§ 125.381 and 135.225 (which applies to all operations within the United States, U.S. territories, U.S. military airports, and foreign airports). For parts 125 and 135 operations, the controlling minimum concept must be used at all airports (with the exception of a part 135 “eligible on-demand” operator who is permitted to start an approach without weather reported above landing minimums (see § 135.225(b)). As a consequence, §§ 125.381(b) and 135.225(b) prohibit parts 125 and 135 operators from conducting look-see approaches at any airport. The controlling minimum concept, however, allows for a pilot to continue a CAT I approach to DA/DH or MDA if the visibility/RVR was reported to be at or above the controlling minimum when the pilot began the FAS, even though a later visibility/RVR report indicates a below-minimum condition. The controlling minimum concept also allows for a pilot (upon reaching DA/DH or MDA and before passing the MAP) to continue the approach below DA/DH or MDA and touchdown if the requirements of § 91.175 are met, even though the visibility/RVR is reported to be below the controlling minimum.

4-281 AIR CARRIER OPERATING MINIMUMS. Although part 97 establishes standard minimums for the various types of approaches and lighting system combinations, these standard minimums cannot automatically be used by parts 121 and 135 certificate holders. The air carrier minimums must consider the high-minimum PIC requirements and basic turbojet requirements contained in OpSpec C054, or any other limitations imposed on the carrier by the FAA where appropriate, as described below.

A. Air Carrier Minimums Limitations. Any limitations to air carrier minimums must be used by all parts 121 and 135 operators until the requirements for special airborne equipment, pilot qualification, pilot training, and/or experience requirements for standard operating minimums are met. The POI may then authorize the certificate holder to use the standard operating minimums (i.e., the minimums defined by the part 97 SIAP).

B. High-Minimum PIC. The increased difficulty in piloting tasks encountered during low visibility approach and landing operations make it necessary for PICs to acquire a certain amount of flight experience before operating to the lowest authorized CAT I minimums. The

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objective of this flight experience requirement is to ensure that the pilot is fully aware of the aircraft's equipment capabilities and limitations, the available external visual cues, and the aircraft's handling characteristics.

1) The flight experience necessary to meet this objective is specified in § 121.652 or § 135.225(e), as applicable. High-minimum PIC requirements for part 135 operations are applicable only to turbine-powered airplanes (turbojet or turbopropeller). These rules require those PICs who do not meet these experience requirements (high-minimum PICs) to increase the published MDA/DA/DH by 100 feet and the published visibility by one-half statute mile or the RVR equivalent. The RVR that must be used when an RVR is published and available is the applicable high-minimum-PIC RVR value specified in OpSpec C054, shown in Table 4-7A, OpSpec C054 RVR Landing Minimum—High-Minimums Pilot in Command.

2) The increased operating minimums for high-minimum PICs always result in operating minimums that are higher than standard minimums. For example, if the minimums published for an ILS approach to a certain runway are HAT 200/RVR 1800, the operating minimums that must be used by a high-minimum PIC for an approach to that runway must not be lower than HAT 300 and RVR 4500 (HAT 200 + 100 feet and the high-minimum PIC equivalent of RVR 1800, which is RVR 4500, as specified in OpSpec C054). If the minimums published for an approach that has a DA/DH were HAT 200 and a visibility of three-fourths statute mile, the high-minimum PIC would have to use a HAT of 300 and a visibility of 1¼ statute miles. Therefore, when dispatching or releasing a flight, the increased operating minimums for high-minimum PICs and the reported and/or forecasted weather conditions at the destination airport must be considered.

3) The specific operating rule provisions, §§ 121.652 and 135.225(e), are similar; however, significant differences exist in the specific details of these rules.

a) Section 121.652 raises high-minimum PIC operating minimums by HAT 100 feet and visibility by one-half statute mile or by the RVR equivalent. The high-minimum PIC RVR equivalents are specified in the OpSpecs. Section 121.652 specifies that the MDA or DA/DH and visibility minimum required for a high-minimum PIC do not have to be raised above the conditions required to designate the airport as an alternate airport.

1. The method for determining alternate minimums, however, is to add a buffer to the HAT/HAA and visibility or RVR authorized for landing. The lowest buffer when determining alternate minimums is to add 200 to the ceiling and one-half mile to the visibility, which is greater than the requirement to add 100 and one-half to determine the high time PIC minimum. Therefore, alternate minimums will always be higher than the high-minimum PIC's landing minimums.

2. This rule establishes HAT 300 feet and one statute mile (or the RVR equivalent as low as RVR 4500) as the lowest straight-in operating minimums for high-minimum PICs when conducting approaches that have a DA/DH or MDA. This rule also permits the 100-hour flight experience requirement to be reduced by up to 50 percent by substituting one landing for 1 required hour of flight experience, provided the PIC has at least 100 hours of PIC time in another type airplane in part 121 operations.

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3. Section 135.225 establishes the same requirements for part 135 operators, with two exceptions.

a. Section 135.225 applies only to turbine-powered (turbojet and turbopropeller) airplanes.

b. Section 135.225 does not permit a reduction to the 100-hour flight experience requirement.

C. Basic Turbojet Minimum. A basic turbojet visibility/RVR operating minimum has been established for all turbojet airplanes operated under parts 121 and 135. The basic turbojet minimum for straight-in approaches is three-fourths statute mile visibility or RVR 4000. Any minimum less than the basic turbojet minimum is not authorized in turbojet aircraft until the specific requirements of OpSpec C054 are met. When the airplane equipment, the runway lighting/marking systems, and the pilots are in compliance and qualified, then the lowest minimums that have been established for various approved approach and runway lighting/marking configurations may be authorized.

Table 4-7A. OpSpec C054 RVR Landing Minimum—High-Minimums Pilot in Command

RVR Landing Minimum as Published	RVR Landing Minimum Equivalent Required for High Minimum Pilots
RVR 1800	RVR 4500
RVR 2000	RVR 4500
RVR 2400	RVR 5000
RVR 3000	RVR 5000
RVR 4000	RVR 6000
RVR 5000	RVR 6000

4-282 AUTOLAND OR HUD TO TOUCHDOWN OPERATIONS. Autoland or HUD to touchdown operations are required for all CAT III operations, and many operators use autoland or HUD for CAT II, CAT I, and VFR operations as well. Sections 121.579(c), 125.329(d), and 135.93(d) prohibit the use of autoland or HUD to touchdown in any operation unless the operator is specifically authorized via OpSpecs. OpSpecs C059 and C060 authorize autoland or HUD to touchdown in CAT II and III operations, respectively. OpSpec C061 or H110 authorizes autoland operations in other than CAT II/III operations and OpSpec C062 or H111 authorizes HUD to touchdown in other than CAT II/III operations.

A. ILS Category Classification. The ILS category classification system provides a more comprehensive method of describing ILS performance than the simple CAT I/II/III classification. ILS facility classification is described in Order 6750.24. A facility's classification is defined by using two characters (I/C, II/D, III/E, etc.).

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1) The first character indicates conformance to the facility performance category standards. This character indicates if the ground equipment is classified as a CAT I, CAT II, or CAT III ILS.

2) The second character defines the ILS point (Figure 4-21, Localizer Course and Glidepath Bend Amplitude limits) to which the LOC conforms to the Facility Performance CAT III course structure tolerances. These classifications indicate ILS conformance to a physical location on the approach or runway as follows:

- A: 4 NM before the threshold.
- B: 3,500 feet before the threshold (CAT I decision point).
- C: Glidepath altitude of 100 feet HAT (CAT II decision point).
- T: Threshold.
- D: 3,000 feet beyond the threshold (CAT III requirement only).
- E: 2,000 feet before the runway end (CAT III requirement only).

B. Use of Autoland at U.S. CAT I Facilities or Equivalent. For CAT I, autoland may be used at runways with facilities other than those with published CAT II or III IAPs if the precautions discussed in subparagraph 4-282C are followed. This is to aid pilots in achieving stabilized approaches and reliable touchdown performance to improve landing safety in adverse weather; for CAT II or III training; to exercise the airborne system to ensure suitable performance; for maintenance checks; or for other such reasons. Use of this capability may be particularly important for pilot workload relief in stressful conditions of fatigue after long international flights; night approaches; crosswinds or turbulence; when there may be other aircraft non-normal conditions being addressed; or to aid safe landing performance in otherwise adverse weather, restricted visibility, or with cluttered runways. This is true even though reported visibility may be well above minimums (e.g., heavy rain distorting view out the windshield, snow-covered runways where markings are not easily visible).

C. ILS Classification and CAT I Autoland Operations. ILS classification is being added to the Airport/Facility Directory (A/FD), but not all ILS runways are included as of February 2012. To support autoland or HUD to touchdown operations, CAT III course structure tolerances to at least point D are highly encouraged (e.g., I/D, II/D, III/D). All published CAT II and III approaches in the United States meet this standard. CAT II approaches that do not support autoland operations will note this limitation via chart note or Notices to Airmen (NOTAM). When conducting autoland operations on a CAT I runway/ILS, runways with a I/D or I/E classification are the most suitable and are preferred. Practice autoland or HUD to touchdown operations may be conducted at CAT I runways in VFR conditions where the facility classification is unknown, because the flightcrew is monitoring system performance, visually verifying the position of the aircraft, and can determine whether to continue to a landing or execute a missed approach in VFR conditions. Though it is not recommended, flightcrew monitoring and increased visibility also permits practice autoland or HUD to touchdown operations using an ILS classified as I/A, I/B, I/C, or I/T, provided the operation is performed in VFR conditions. The flightcrew must be ready at all times to execute a missed approach when conducting CAT I autolands. The FAA maintains an “information only” list of ILS classification status at http://avnwww.jccbi.gov/pls/datasheet_prd/PRO_ilsperform_rpt.

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D. Pre-Threshold Terrain.

1) The Flight Operations Branch (AFS-410) maintains a list of CAT II/III runways with special terrain that may affect autoland or HUD to touchdown operations, such as irregular pre-threshold terrain or TDZ slope. This list is available at http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs400/afs410/status_lists/. Each operator and aircraft must be approved for each special terrain runway to conduct any CAT II or III operations using autoland or HUD to touchdown. Volume 4, Chapter 2, Section 2 contains more information about how to authorize CAT II/III operations at special terrain runways.

2) The FAA does not analyze CAT I runways to determine if any irregular pre-threshold terrain will impact autoland or HUD to touchdown operations. Practice autoland or HUD to touchdown operations may be conducted at CAT I runways where the pre-threshold terrain has not been analyzed because the flightcrew is monitoring system performance, visually verifying the position of the aircraft, and can determine whether to continue to a landing or execute a missed approach in VFR conditions. All operators approved to use autoland- or HUD-equipped aircraft should be encouraged to routinely use these systems at suitably equipped runways during operations in VFR and in CAT I IFR conditions. Flightcrew training should emphasize the importance of monitoring equipment performance on all practice autolands.

E. Maintenance Return to Service and Required Practice Autolands. An aircraft manufacturer and certification requirements may require that a practice autoland or HUD to touchdown be performed on a published CAT II or III approach. If so, the operator should adhere to these requirements. If autoland is not required to be performed on a CAT II ILS, it is important to note that an unsatisfactory approach is extremely difficult to attribute to small errors in ILS ground equipment. Even CAT I ILS facilities that meet CAT III signal standards are not monitored to the same tolerances as CAT II/III facilities. An unsatisfactory approach due to a critical area incursion is something that may be identified, but an unsatisfactory approach due to a signal or monitor error cannot be detected by the flightcrew or maintenance.

F. Flightcrew Training. In addition to other training requirements, flightcrew training should emphasize the importance of:

1) Monitoring equipment performance and visual verification of aircraft position on all practice autolands.

2) Verifying that the CAT I approach does not have any charted restrictions that would prohibit autoland or HUD to touchdown operations ("ILS unusable within 0.5 DME," "autopilot coupled approach not authorized below XXX feet").

3) Requesting that ATC protect the critical area for all practice autolands. ATC will protect the ILS critical areas if the ceiling is less than 800 feet and/or the visibility is less than 2 miles. Note that ATC is not required and may not be able to protect the critical areas if the weather is better than 800/2.

4) Performing maintenance return to service as required by either the manufacturer, certification, or the operator, as described in subparagraph 4-282E.

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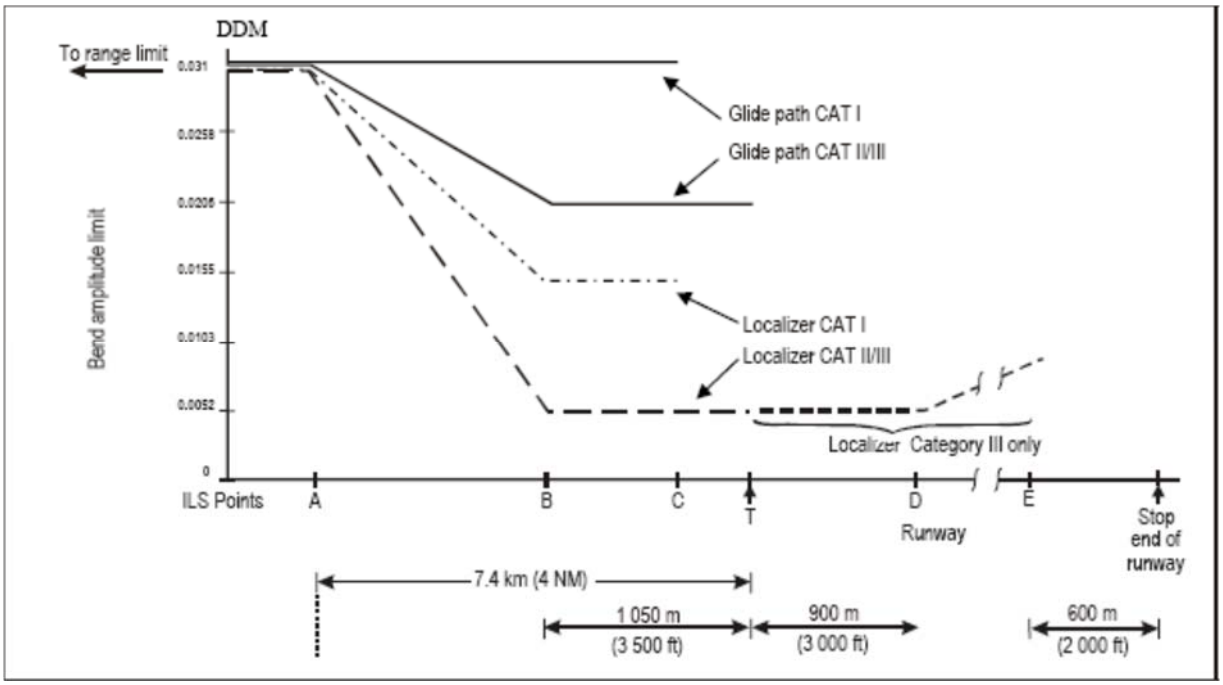
Figure 4-21. Localizer Course and Glidepath Bend Amplitude Limits



RESERVED. Paragraphs 4-283 through 4-299.

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VOLUME 4 AIRCRAFT EQUIPMENT AND OPERATIONAL AUTHORIZATION

CHAPTER 2 ALL WEATHER TERMINAL AREA OPERATIONS

Section 6 Category II Operations

4-300 OVERVIEW. This section contains concepts, direction, and guidance to be used by principal inspectors (PI) for evaluating and approving or denying requests for authorization to conduct Special Authorization (SA) Category (CAT) I, CAT II, CAT II (Runway Visual Range (RVR) 1000), and SA CAT II operations. This includes all SA CAT I, CAT II, CAT II (RVR 1000), and SA CAT II operations at airports and runways new to an operator/program manager, even though previously approved aircraft, airborne equipment, ground-based equipment, concepts, and procedures are being used in these operations. Although SA CAT I is not a CAT II operation, it is included in this section because it requires CAT II authorization using an approved CAT II or III Head-Up Display (HUD) to decision height (DH). Additional information may be found in Volume 4, Chapter 2, Section 1.

4-301 APPLICABILITY. The intent is that the PI will use the general information provided in this section, along with the specific information provided in Volume 4, Chapter 2, Section 2 for domestic operators and Volume 4, Chapter 2, Section 8 for Title 14 of the Code of Federal Regulations (14 CFR) part 129 foreign air carriers, when evaluating requests for SA CAT I, CAT II, and SA CAT II operations. This process is only applicable for operator requests for instrument landing system (ILS)-based CAT II operations. Requests for other than ILS-based CAT II should be forwarded to the regional Flight Standards division (RFSD) Next Generation (NextGen) Branch (AXX-220). Volume 4, Chapter 2, Section 3 contains the requirements to authorize a small Category A aircraft for CAT II operations.

4-302 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.

- CAT II/III ILS Operations Phase I Approval: 1430.
- CAT II/III ILS Operations Phase II Approval: 1431.
- CAT II/III ILS Operations Phase III Approval: 1432.
- CAT II/III ILS Operations Phase IV Approval: 1433.
- CAT II/III ILS Operations Phase V Approval: 1434.

4-303 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Title 14 CFR parts 91, 97, 119, 121, 125, 129, and 135.
- Federal Aviation Administration (FAA) Order 6750.24, Instrument Landing System and Ancillary Electronic Component Configuration and Performance Requirements.
- FAA Order JO 7110.65, Air Traffic Control.
- FAA Order JO 7210.3Y, Facility Operation Administration.
- FAA Order 8260.49, Simultaneous Offset Instrument Approach (SOIA).

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- FAA Order 8400.13, Procedures for the Evaluation and Approval of Facilities for Special Authorization Category I Operations and All Category II and III Operations.
- Advisory Circular (AC 25-7), Flight Test Guide for Certification of Transport Category Airplanes.
- AC 97-1, Runway Visual Range (RVR).
- AC 120-28, Criteria for Approval of Category III Weather Minima for Takeoff, Landing, and Rollout.
- AC 120-29, Criteria for Approval of Category I and Category II Weather Minima for Approach.
- AC 120-57, Surface Movement Guidance and Control System.
- AC 120-71, Standard Operating Procedures for Flight Deck Crewmembers.
- Technical Standard Orders (TSO).
- U.S. Flight Information Publications (FLIP).

B. Forms. None.

C. Job Aids. None.

4-304 DEFINITIONS.

A. CAT II Runway Visual Range (RVR) 1000. Order 8400.13 authorizes CAT II approaches with a DH as low as 100 feet and visibility minimums of RVR 1000 to runways which meet all CAT II equipment, performance, and lighting requirements. The operator must use either autoland or HUD approved to touchdown.

B. Special Authorization (SA) Category (CAT) I. Order 8400.13 authorizes SA CAT I approaches to a radio altimeter (RA) DH as low as 150 feet and a visibility minimum as low as RVR 1400 to runways that do not have touchdown zone (TDZ) or runway centerline (RCL) lighting when the approach is flown using an aircraft with an approved CAT II or III HUD to DH.

C. SA CAT II. Order 8400.13 authorizes CAT II approaches with a DH as low as 100 feet and visibility minimums of RVR 1200 at runways which do not meet all of the lighting requirements (Approach Lighting System with Sequenced Flashing Lights (ALSF)-2, TDZ, RCL lights) for standard CAT II. The operator must use either autoland or HUD approved to touchdown.

D. Standard CAT II Operations. CAT II operations are approach and landing operations conducted with a DH of less than 200 feet (60 meters) but not less than 100 feet (30 meters), and an RVR of not less than 1,200 feet (350 meters).

4-305 APPROVAL METHOD.

A. Part 91. A part 91 (including part 91 subpart F (part 91F)) large aircraft operator is issued a letter of authorization (LOA) for SA CAT I.

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B. Part 125 Letter of Deviation Authority (LODA) Holders (Part 125M in the Web-Based Operations Safety System (WebOPSS) Database). A part 125 LODA holder is issued an LOA for SA CAT I using C052 in WebOPSS, and issued CAT II (RVR 1200), CAT II (RVR 1000), and/or SA CAT II (RVR 1200) using C059 in WebOPSS.

C. Part 91 Subpart K (Part 91K). A part 91K operator is issued a management specification (MSpec) for SA CAT I using C052 and an MSpec for CAT II (RVR 1200), CAT II (RVR 1000), and/or SA CAT II (RVR 1200) using C059 in WebOPSS.

D. Part 121, 125, 129, and 135. Part 121, 125, 129, or 135 operators are issued operations specification (OpSpec) C052 for SA CAT I and OpSpec C059 for CAT II (RVR 1200), CAT II (RVR 1000), and SA CAT II (RVR 1200) in WebOPSS. Issue OpSpec H108 for CAT II helicopter operations.

4-306 GENERAL.

A. Objective. The essential difference between CAT I and II operations is that a CAT II operation places greater reliance on the guidance provided by the airborne and ground-based equipment. This equipment must be capable of delivering the aircraft to a position from which the flightcrew can accomplish a transition from instrument to visual flight at a height above touchdown (HAT) of 100 feet and complete the landing in the reduced (CAT II) seeing-conditions. The primary objective of CAT II operations is to provide a level of safety equivalent to CAT I precision instrument approach operations, even though the seeing-conditions in CAT II operations can be much worse than those encountered in CAT I operations. This objective (the equivalent level of safety) is achieved by the following:

- Enhanced reliability and precision in the airborne and ground-based equipment to increase the precision of flightpath control;
- Enhanced flightcrew training and qualifications to increase the precision of flightpath control;
- Additional airport visual aids to enhance seeing-conditions;
- Additional criteria to ensure obstacle and terrain clearance;
- Additional criteria to ensure ILS signal protection;
- Special operational procedures; and
- Special air traffic control (ATC) procedures, limitations, or both.

B. Operational Approval Basis. CAT II operations are approved for an operator by the issuance of an OpSpec/MSpec/LOA that authorizes the conduct of CAT II instrument approach procedures (IAP) at specified airports. The basis for this approval depends on the operating rules applicable to the operation (part 91K, 121, 125, or 135), the complexity of aircraft (turbine-powered, reciprocating, or helicopter), the passenger capacity of the aircraft, and/or the size of the aircraft (large or small). The operator evaluation and approval process for reduced visibility flight operations, including CAT II/III operations, is covered in depth in Volume 4, Chapter 2, Section 2.

4-307 CAT II OPERATIONAL CONCEPTS. The weather conditions in a CAT II operation restrict seeing-conditions so that the external visual references necessary to manually control the

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aircraft are not acquired until the aircraft reaches a very low altitude (typically 100 to 200 feet above ground level (AGL)). Therefore, the flightcrew must operate and control the aircraft by referring to instruments throughout most of the approach and to a combination of instrument and external visual information during the final stages of the approach, flare (deceleration for helicopters), and landing. Because of the reduced maneuvering capability resulting from CAT II seeing-conditions, the precision of the flight guidance system and the overall precision of flightpath control must ensure that the aircraft can be flown to a position that is closely aligned with the RCL and the desired glidepath. The increased reliability and precision required of the airborne and ground-based equipment is necessary to ensure that when the aircraft arrives at DH it is on a flightpath that permits the pilot to complete the landing without any significant runway alignment maneuvers. All CAT II operations are conducted in accordance with the DH and RVR concepts used in CAT I operations. However, because of the limited seeing-conditions available in CAT II weather conditions, the additional requirements outlined under the objective of CAT II operations are necessary to ensure that an adequate level of safety is maintained when an aircraft is being operated in these conditions. Technologies such as HUD and automatic landing systems have resulted in additional operational capability of airborne avionics systems and the potential for additional landing minimums credit. These airborne systems, coupled with modern reliable ILS and more restrictive performance requirements associated with procedures developed for low visibility operations, CAT II or lower-than-standard CAT I operations can now be authorized to approved runways that were originally programmed to just support basic CAT I operations (Order 8400.13).

A. Function of Visual Reference. Because of the limitations in the airborne equipment used in CAT II operations and the available instrument guidance, the pilot must have sufficient visual references to manually control and maneuver the aircraft from the DH to a full stop on the runway. These external visual references are required below DH for the pilot to control and maneuver the aircraft, align the aircraft with the RCL, touch down within the TDZ, and then roll out on the runway.

B. Purpose of CAT II Operating Minimums. CAT II operating procedures and minimums have been established to ensure that the desired level of safety is achieved when CAT II seeing-conditions exist. These operating minimums are based on the DH and RVR concepts. The established operating minimums (DH and RVR) determine the minimum safe heights for instrument flight and the minimum RVR at which the landing can be safely completed by external visual reference in a particular aircraft. These operating minimums are based on established CAT II operational concepts and on the required CAT II airborne equipment, ground-based visual and electronic equipment, operating procedures, and pilot training and qualification. These operating minimums, when combined with other CAT II requirements, ensure that the combination of information available from external visual sources and the aircraft instruments and equipment are sufficient to enable properly qualified pilots to safely operate the aircraft along the desired flightpath.

C. Establishing Operating Minimums.

1) Several sets of operating minimums are established for CAT II operations. For standard CAT II operations, minimums are DH 150/RVR 1600, DH 100/RVR 1600, and DH 100/RVR 1200. For operations based on autoland or Head-Up-Guidance System (HGS),

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minimums can be as low as DH 100/RVR 1000 (at foreign airports and domestic ILS Type III facilities), and an SA for CAT II operations can be approved for RVR 1200 at specially approved ILS facilities that do not meet International Civil Aviation Organization (ICAO) standards for ALSF/TDZ/RCL lighting systems. Most runways that support CAT II operations permit the use of DH 100/RVR 1200 operating minimums. Operating minimums at some runways, however, are restricted to DH 150/RVR 1600 because of limitations in the ground equipment (such as a single RVR reporting system), localizer signal reliability, limitations imposed by the pre-threshold terrain (RA not authorized), and/or obstacle clearance limitations in the final approach surface, the approach light surface, the touchdown area, and the missed approach area.

2) Order 8400.13 sets forth standards for a specific facility to be modified and approved for the SA CAT II operations. For an approved facility, there will be a CAT II procedure developed to conform to the standard Terminal Instrument Procedures (TERPS) CAT II development criteria and published as a part 97 Standard Instrument Approach Procedures (SIAP). In addition to the standard note, "CAT II SPECIAL AIRCREW AND AIRCRAFT AUTHORIZATION REQUIRED," that appears on the chart, an additional note will be included: "This CAT II does not meet ICAO standard for ALSF/TDZ/RCL light systems. Specific OpSpecs/MSpecs/LOAs to conduct this approach using autoland or HGS to touchdown is required." The CAT II operating minimums for individual operators and specific aircraft are established in accordance with the criteria in AC 120-29, this order, Order 8400.13, and U.S. TERPS.

D. CAT II Flight Guidance and Control Systems. Standard CAT II operations are based on the use of special airborne and ground-based equipment that have capability, reliability, and redundancy superior to the equipment required for CAT I operations (see AC 120-29). Although CAT II airborne equipment provides increased capability, reliability, and redundancy, the flight control guidance systems used in these operations are not necessarily capable of automatically detecting all potential failures that could significantly disturb the aircraft's flightpath (e.g., single-channel flight control systems). If such failures occur, the flightcrew must be able to quickly detect the failure and to intervene manually to continue safely to the approach and landing or execute a missed approach. In other words, CAT II operations without autoland are based on the use of single-channel flight directors (FD), single-channel autopilots, or combinations of both. Even though some CAT II operations are based on dual independent FDs, each of these systems is usually a single-channel system that is not capable of detecting all potential failures. Therefore, even with dual independent FDs, the flightcrew must be able to detect failures and manually intervene in certain cases. CAT II operations are also based on the use of redundant ILS ground equipment; dual ILS airborne equipment; RAs (to identify DH); instrument failure detection and warning systems; special missed approach guidance equipment; and rain removal equipment. SA CAT II operations are based on procedures developed for use on specific approved facilities and that the aircraft are certified for CAT III operations; i.e., autoland or HUD to touchdown (Order 8400.13).

E. Autoland or HUD to Touchdown at CAT I Runways. Volume 4, Chapter 2, Section 5 contains guidance about the use of autoland or HUD to touchdown at CAT I runways.

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F. Airworthiness of CAT II Airborne Equipment.

1) Throughout the history of CAT II operations, two processes have existed for showing that the airborne equipment of the aircraft is Airworthy for CAT II operations. One process is the type design approval process in which approval is obtained during aircraft certification testing. The other is the operational demonstration and approval process in which approval is obtained after the operator/program manager demonstrates satisfactory airworthiness of the equipment in actual flight operations. Currently, the most prevalent process is the type design approval process in which approval is contained in the FAA-approved Aircraft Flight Manual (AFM). Aircraft that have CAT II type design approval are not required to undergo an operational airworthiness demonstration. The operator/program manager is responsible for providing official written FAA documentation that the aircraft is CAT II certified.

2) For aircraft that do not have CAT II type design approval, an operational demonstration of CAT II airworthiness in accordance with AC 120-29 is required. Generally, this operational demonstration program includes a requirement that the operator conduct at least 300 approaches to 100 feet in CAT I or better weather conditions using the proposed CAT II system. RFSD NextGen Branch (AXX-220) concurrence is required before any operational demonstration and approval program may be initiated.

3) Special design requirements and special maintenance programs are necessary to achieve the airborne system reliability required for the conduct of CAT II operations. The special maintenance programs necessary for CAT II operations are extensive and expensive and are usually the largest factors affecting an operator's decision of whether to conduct these operations.

G. Airports and Runways. U.S. operators with the CAT II OpSpec/MSpec/LOA are approved to conduct CAT II operations for any U.S. airport/runway (excluding special terrain CAT II/III airports/runways) for which a CAT II IAP has been published.

H. Foreign CAT II IAP.

1) Operations. All CAT II operations by U.S. operators at foreign airports must be authorized in accordance with the guidance and direction in this order. All foreign runways approved for CAT II operations by U.S. operators must also meet the requirements of this order and the current edition of Order 8260.31, Foreign Terminal Instrument Procedures (FTIP).

2) Foreign Equivalence. Although it is recognized that the CAT II ground-based systems and procedures at foreign airports may not be in exact accordance with U.S. standards, it is critical for the foreign airports to provide the information and functions that are necessary for CAT II operations in a manner consistent with the intent of U.S. CAT II standards.

3) General. The FAA region that has surveillance responsibility for a particular foreign airport has the responsibility for evaluating any runway at that airport that supports CAT II operations. The controlling region is also responsible for evaluating these CAT II runways in accordance with Order 8260.31 and for recommending approval or disapproval of CAT II operations to those runways. The controlling region's recommendations must be

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forwarded to the Flight Technologies and Procedures Division (AFS-400) for further evaluation and final approval or disapproval.

NOTE: Foreign runways that have been determined to be equivalent to U.S. CAT II standards and approval for CAT II operators are identified in the list of runways maintained by AFS-400. Operators desiring CAT II approvals at foreign airports that are not on this approved list should submit a request for evaluation and approval through their principal operations inspector (POI) to the RFSD NextGen Branch. The controlling region's NextGen Branch will conduct an evaluation. Upon successful completion of the evaluation, the NextGen Branch will notify AFS-400 for final approval and addition to the approved list.

4) Determining Equivalence. The major factor that is considered by the controlling region in approving foreign runways in accordance with Order 8260.31 for CAT II operations by U.S. operators is the degree of equivalence with U.S. CAT II standards. This determination evaluates the equivalence of:

- High intensity approach lights;
- High intensity runway edge lights;
- TDZ and RCL lights;
- Taxiway edge lights;
- High-intensity taxiway centerline lights;
- Runway markings;
- The quality and integrity of the approach and landing ground-based guidance system;
- The RVR reporting capabilities and procedures;
- ILS critical areas, including signs and markings;
- Obstacle clearance protection in the approach and missed approach, including the obstacle-free zone;
- Airport surface traffic control;
- Terminal area ATC; and
- Procedures for regulating the ground movement of aircraft and vehicles during CAT III operations.

5) Authorizing Foreign CAT II Runways. All CAT II operations conducted in foreign countries must be conducted in accordance with the operator's CAT II OpSpecs. The only means of approving these operations is through the issuance of OpSpecs, which specify the foreign runways and minimums authorized for each aircraft used by the operator. OpSpecs C059 and H108 specify the CAT II IAPs, runways, operating minimums, limitations, and aircraft authorized for CAT II operations for a particular operator. These paragraphs also specify the CAT II airborne equipment, RVR equipment, pilot qualification, and missed approach requirements that apply to the operator's CAT II operation. If the flightcrew is properly qualified and the aircraft is properly equipped and maintained, an operator can, in general, be authorized to conduct CAT II All Weather Terminal Area Operations (AWTA) to any foreign runway approved for CAT II operations. The exception to this are those runways specified as restricted CAT II runways. The criteria in AC 120-29 and this order establish the lowest approach and

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landing minimums that can be authorized, under any circumstances, for CAT II operations. The lowest minimums for each kind of CAT II operation for a particular operator are specified in OpSpecs C059 and H108, as appropriate. FAA inspectors shall not authorize an operator to use minimums lower than these values. Additionally, inspectors shall not authorize the use of CAT II minimums for any foreign runway unless the provision of this order and Order 8260.31 are met.

I. CAT II Operations to Airports/Runways with Special (Irregular) Terrain.

1) Certain airports/runways with CAT II/III IAPs are built on irregular terrain (Spokane International Airport (KGEG)) or have irregular terrain prior to the threshold (Pittsburgh International Airport (KPIT), Seattle-Tacoma International Airport (KSEA), Denver International Airport (KDEN), Cincinnati/Northern Kentucky International Airport (KCVG)) that has potential impact on autoland/HUD to touchdown capabilities. Every new aircraft type/model must be evaluated by a lead operator on each of these runways in CAT I conditions or better before autoland/HUD to touchdown operations can be conducted in CAT II conditions. After review and approval by RFSD and AFS-400, that runway and aircraft type/model will be added to the approved list located on the AFS-400 Web site. The process for conducting special terrain evaluation is described in detail in AC 120-28 and summarized in Volume 4, Chapter 2, Section 2.

2) Every subsequent operator requesting CAT II autoland/HUD to touchdown at any of the special terrain airports/runways using an aircraft type/model listed on the AFS-400 Web site must conduct 15 landings in CAT I conditions or better to verify that their autoland procedures and maintenance will permit safe autoland operations at that runway. The process for subsequent operators conducting special terrain operations is described in detail in AC 120-28 and summarized in Volume 4, Chapter 2, Section 2.

J. Regional and Headquarters' (HQ) Review and Concurrence. All initial approvals for CAT II operations that are based on ILS facilities for each type of aircraft operated by an operator/program manager require review and concurrence by the RFSD NextGen Branch (AXX-220) before an OpSpec/MSpec/LOA may be issued for that operation. Unless specified otherwise in the RSFD review and concurrence, subsequent reductions in CAT II operating minimums for each aircraft type do not require further RFSD concurrence before the revised OpSpec/MSpec/LOA authorizing the lower minimums can be issued to the operator.

4-308 STANDARD CAT II OPERATIONS. Standard CAT II operating minimums (DH 100/RVR 1200) are based on the building block approach. The building-block approach is based on CAT I operations, including standard CAT I requirements, and includes the special aeronautical knowledge, experience, skill, training, and qualifications as well as the special airborne and ground-based equipment specified in AC 120-29. The assumptions and criteria used in aircraft certification and CAT II IAP design must be compatible with the operational concepts in this order. These assumptions and criteria ensure that flightcrews and aircraft that meet the requirements of this order and AC 120-29 can be used to safely conduct CAT II operations using standard CAT II minimums. Any special equipment or procedures necessary for the safe conduct of CAT II operations must be specified in the airworthiness certification basis of the aircraft (type certificate (TC) or Supplemental Type Certificate (STC)) or in the FAA-approved AFM. Any aircraft that cannot be safely operated to standard CAT II operating minimums using

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flightcrews that meet the minimum requirements of this order and AC 120-29 shall not be certificated or otherwise approved for CAT II operations. The OpSpec/MSpec/LOA establishes the lowest operating minimums that can be used in any CAT II operation, even if the established IAP specifies minimums lower than those values. Special airborne equipment, special ground-based equipment, and special flightcrew training required for CAT II operations are specified in this order, AC 120-29, and the FAA-approved AFM.

A. OpSpec/MSpec/LOA for Standard CAT II. OpSpec/MSpec/LOA C059 authorizes standard CAT II for parts 91, 91K, 121, 125, 129, and 135 operators. Guidance on authorizing C059 is contained in Volume 3, Chapter 18, Section 5, and in Volume 12, Chapter 2, Section 5 for part 129.

B. Standard CAT II Operating Minimums. The standard CAT II operating minimums for all aircraft are DH 100 and RVR 1200. The DH is typically based on the use of radio (radar) altimetry. Procedures that have "Radio Altitude minimums Not Authorized (RA NA)" (for example, due to irregular underlying terrain) typically use the first indication of arrival at the inner marker (IM) as a means to establish decision altitude (DA)/decision height (DH). However, an operator may elect to use first indication of arrival at either the IM or the barometric altitude DA, whichever comes first, as the means for minimums determination.

C. Higher-Than-Standard CAT II Operating Minimums. The higher-than-standard CAT II minimums for all aircraft are DH 100 and RVR 1600. These minimums are usually applied as interim minimums (restricted to higher-than-standard CAT II minimums) for a 6-month demonstration period for operators/program managers new to CAT II operations. The first 6 months are used to validate the effectiveness of the operator's/program manager's maintenance program and operational procedures in order to support issuance of the standard CAT II minimums. These minimums are also applied when there are RVR sensor limitations (only one installed), irregular underlying terrain, obstacle clearance requirements, or pre-threshold terrain limitations (RA not authorized—RA NA), which preclude the use of standard CAT II minimums.

4-309 SA CAT I OPERATIONS. SA CAT I operations are based on the use of a CAT II or III HUD to maintain a more precise lateral and vertical track, reduce Flight Technical Error (FTE), and avoid division of attention between flight instruments and visual identification of the landing area. SA CAT I procedures allow increased capacity in reduced visibility conditions using existing airport infrastructure. A runway may be eligible for SA CAT I if it meets the criteria in Order 8400.13 and is equipped with a suitable ILS that provides localizer and glideslope guidance to the runway threshold.

A. Operator Requirements for SA CAT I. To conduct SA CAT I operations, the operator must be authorized for either CAT II or III operations using an approved CAT II or CAT III HUD to DH.

1) If the operator is not approved for CAT II or III operations using an approved HUD, then the operator must first complete the CAT II/III approval process in Volume 4, Chapter 2, Section 2.

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2) If the operator is approved for CAT II or III operations using an approved HUD, completion of the CAT II/III approval process is not required for SA CAT I.

B. OpSpec/MSpec/LOA for SA CAT I. SA CAT I authorization is contained in selectable text in OpSpec/MSpec/LOA C052 for parts 91K, 121, 125, 129, and 135 operators, and in LOA C059 for part 91 operators. Guidance on authorizing C052 and C059 is contained in Volume 3, Chapter 18, Section 5, and in Volume 12, Chapter 2, Section 5, for part 129.

C. SA CAT I Operating Minimums. SA CAT I approaches have an RA DH as low as 150 feet and a visibility minimum as low as RVR 1400 to runways that do not have TDZ or RCL lighting and require that the approach is flown using an aircraft with a HUD to DH.

4-310 CAT II RVR 1000 OPERATIONS. Order 8400.13 authorizes CAT II RVR 1000 operating minimums using autoland or HUD approved to touchdown at runways that meet all equipment, monitoring, and infrastructure requirements for standard CAT II. The runway must also have an approved Surface Movement Guidance and Control System (SMGCS) operation that provides a taxi routing from the landing runway to the parking area.

A. Operator Requirements for CAT II RVR 1000. To conduct CAT II RVR 1000 operations, the operator must be authorized for either CAT II or III operations using autoland or an approved HUD that provides guidance to touchdown.

1) If the operator is not approved for CAT II or III operations using autoland or an approved HUD that provides guidance to touchdown, then the operator must first complete the CAT II/III approval process in Volume 4, Chapter 2, Section 2. The operator is eligible for CAT II RVR 1000 when RVR 1200 minimums using autoland or an approved HUD that provides guidance to touchdown are authorized through the CAT II/III approval process.

2) If the operator is approved for CAT II or CAT III operations using autoland or an approved HUD that provides guidance to touchdown, completion of the CAT II/III approval process is not required for CAT II RVR 1000.

B. OpSpec/MSpec/LOA for CAT II to RVR 1000. CAT II RVR 1000 authorization is contained in selectable text in OpSpec/MSpec/LOA C059 for parts 91, 91K, 121, 125, 129, and 135 operators. Guidance on authorizing C059 is contained in Volume 3, Chapter 18, Section 5, and in Volume 12, Chapter 2, Section 5 for part 129.

C. CAT II RVR 1000 Operating Minimums. The CAT II RVR 1000 operating minimums for all aircraft are DH 100 and RVR 1000. The RVR 1000 minimum is indicated in a chart note, referenced to the standard CAT II line of minimums, which states, “Requires specific OpSpec, MSpec, or LOA approval and use of autoland or HUD to touchdown.” The use of autoland or HUD to touchdown is required. The DH is typically based on the use of radio (radar) altimetry. Another acceptable method at runways where an IM is available is to use both the IM and barometric altimeter. In these situations, the decision to continue for landing or execute a missed approach takes place at the first indication of the IM or at the published barometric DA, whichever occurs first.

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4-311 SA CAT II OPERATIONS. SA CAT II operating minimums for all aircraft are not less than DH 100 and visibility of not less than RVR 1200 using autoland or HUD approved to touchdown. The intent of SA CAT I is to achieve lower landing minimums on runways that have the ILS facilities capable of supporting CAT II or CAT III approaches, but lack the instrument approach and/or runway lighting for CAT II or CAT III. Autoland or HUD approved to touchdown provides the equivalent level of safety as a standard CAT II approach. Specific details on SA CAT II can be found in FAA Order 8400.13.

A. Operator Requirements for SA CAT II. To conduct SA CAT II operations, the operator must be authorized for either CAT II or III operations using autoland or an approved HUD that provides guidance to touchdown.

1) If the operator is not approved for CAT II or III operations using autoland or an approved HUD that provides guidance to touchdown, then the operator must first complete the CAT II/III approval process in Volume 4, Chapter 2, Section 2. The operator is eligible for SA CAT II when RVR 1200 minimums are authorized through the CAT II/III approval process.

2) If the operator is approved for CAT II or III operations using autoland or an approved HUD that provides guidance to touchdown, completion of the CAT II/III approval process is not required for SA CAT II.

B. OpSpec/MSpec/LOA for SA CAT II. SA CAT II authorization is contained in selectable text in OpSpec/MSpec/LOA C059 for parts 91, 91K, 121, 125, 129, 135 operators. Guidance on authorizing C059 is contained in Volume 3, Chapter 18, Section 5, and in Volume 12, Chapter 2, Section 5 for part 129.

C. SA CAT II Operating Minimums. The SA CAT II operating minimums for all aircraft are DH 100 and RVR 1200. The DH is based on the use of radio (radar) altimetry. Barometric altimetry is not an acceptable means of establishing the DH for SA CAT II operations.

4-312 OPERATIONAL CREDIT FOR CAT III EQUIPMENT.

A. Purpose of Program Validation. In standard CAT II operations, the objective of the requirement for an operator to validate the CAT II maintenance program for at least 6 months with minimums restricted to DH 100 and RVR 1600 is to ensure that the required level of airborne equipment reliability is achieved. This is to ensure that frequent malfunctions will not occur in standard CAT II operations (DH 100 and RVR 1200). The design features of CAT III airborne equipment significantly reduce the potential for failures that could adversely affect standard CAT II operations. As a result, validation of the CAT II maintenance program before conducting operations to DH 100/RVR 1200 is not necessary if these operations are conducted under a restriction that requires the airborne equipment to operate to CAT III standards (e.g., fail passive (FP) or fail operational (FO) automatic landing).

B. Opting Out of Program Validation. If the operator requests to eliminate the 6-month restriction (DH 100 and RVR 1600) based on operational credit for the use of CAT III systems to conduct CAT II operations, the operator OpSpec/MSpec/LOA must include a limitation that specifies all CAT II operations using DH 100 and RVR 1200 must be conducted

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with the airborne equipment operating to CAT III standards. This limitation should read FP autoland only, or FP/FO autoland only, as appropriate, for aircraft equipped with CAT III automatic landing systems, or FP HUD only for aircraft equipped with CAT III HUD. For DH 100 and RVR 1200 operations, these restrictions must remain in the operator OpSpecs/MSpecs/LOA until the CAT II maintenance program for that aircraft is successfully validated.

RESERVED. Paragraphs 4-313 through 4-330.

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VOLUME 4 AIRCRAFT EQUIPMENT AND OPERATIONAL AUTHORIZATION

CHAPTER 2 ALL WEATHER TERMINAL AREA OPERATIONS

Section 7 Category III Operations

4-331 OVERVIEW. This section contains concepts, direction, and guidance to be used by principal inspectors (PI) for evaluating and approving or denying requests for authorization to conduct all Category (CAT) III operations. This includes all CAT III operations at airports and runways new to an operator/program manager, even though previously approved aircraft, airborne equipment, ground-based equipment, concepts, and procedures are being used in these operations. Additional information may be found in Volume 4, Chapter 2, Section 1.

4-332 APPLICABILITY. The intent is that the PI will use the general information provided in this section, along with the specific information provided in Volume 4, Chapter 2, Section 2 for domestic operators and Volume 4, Chapter 2, Section 8 for Title 14 of the Code of Federal Regulations (14 CFR) part 129 foreign air carriers when evaluating requests for CAT III operations. This process is only applicable for operator requests for instrument landing system (ILS)-based CAT III operations. Requests for other than ILS-based CAT III should be forwarded to the regional Flight Standards division (RFSD) Next Generation (NextGen) Branch (AXX-220).

4-333 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.

- CAT II/III ILS Operations Phase I Approval: 1430.
- CAT II/III ILS Operations Phase II Approval: 1431.
- CAT II/III ILS Operations Phase III Approval: 1432.
- CAT II/III ILS Operations Phase IV Approval: 1433.
- CAT II/III ILS Operations Phase V Approval: 1434.

4-334 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Title 14 CFR Parts 91, 97, 119, 121, 125, 129, and 135.
- FAA Order 6750.24, Instrument Landing System and Ancillary Electronic Component Configuration and Performance Requirements.
- FAA Order 7110.65, Air Traffic Control.
- FAA Order JO 7210.3Y, Facility Operation Administration.
- FAA Order 8260.49, Simultaneous Offset Instrument Approach (SOIA).
- FAA Order 8400.13, Procedures for the Evaluation and Approval of Facilities for Special Authorization Category I Operations and All Category II and III Operations.
- Advisory Circular (AC) 25-7, Flight Test Guide for Certification of Transport Category Airplanes.
- AC 97-1, Runway Visual Range (RVR).

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- AC 120-28, Criteria for Approval of CAT III Weather Minima for Takeoff, Landing, and Rollout.
- AC 120-29, Criteria for Approval of Category I and Category II Weather Minima for Approach.
- AC 120-57, Surface Movement Guidance and Control System.
- AC 120-71, Standard Operating Procedures for Flight Deck Crewmembers.
- Technical Standard Orders (TSO).
- U.S. Flight Information Publications (FLIP).

B. Forms. None.

C. Job Aids. None.

4-335 DEFINITIONS.

A. Category (CAT) III Operations. CAT III operations are separated into three subcategories: CAT IIIa, CAT IIIb, and CAT IIIc.

B. CAT IIIa Operations. CAT IIIa is an approach and landing operation with a Runway Visual Range (RVR) of not less than 700 feet (200 meters) without a decision height (DH), or with a DH of less than 100 feet (30 meters), or an alert height (AH), which is typically between 50 and 200 feet, depending on aircraft certification and operator preferences. Both fail passive (FP) and fail operational (FO) airborne equipment can be used in CAT IIIa operations.

C. CAT IIIb Operations. CAT IIIb is an approach and landing operation with an RVR of less than 700 feet (200 meters) but not less than 150 feet (50 meters) and a DH of 50 feet (15 meters) or less, or an AH, which is typically between 50 and 200 feet, depending on aircraft certification and operator preferences. Both FP and FO airborne equipment can be used for CAT IIIb operations. Presently, the lowest FAA-approved minimum for any CAT III operations is RVR 300 (75 meters) due to difficulties in accomplishing safe ground movement for both aircraft and ground safety services, such as Aircraft Rescue and Fire Fighting (ARFF).

D. CAT IIIc Operations. CAT IIIc is an approach and operation landing without a DH and without RVR limitations (zero-zero). CAT IIIc operations are currently not authorized.

4-336 APPROVAL METHOD.

A. Part 91 and Part 125 Letter of Deviation Authority (LODA) Holder. A part 91 (including part 91 subpart F) or 125 LODA holder operator is issued a letter of authorization (LOA) for all CAT III operations using the C060 in Web-based Operations Safety System (WebOPSS).

B. Part 91 Subpart K (Part 91K). A part 91K operator is issued a management specification (MSpec) for all CAT III operations using C060 in WebOPSS.

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C. Parts 121, 125, 129, and 135. Part 121, 125, 129, or 135 operators are issued operations specification (OpSpec) C060 for all CAT III operations (or H109 for helicopter operations) in WebOPSS.

4-337 GENERAL.

A. Concepts, Direction, and Guidance. This section contains concepts, direction, and guidance to be used by inspectors for evaluating and approving or denying requests for authorization to conduct CAT III All Weather Terminal Area Operations (AWTA). All CAT III operations using aircraft, airborne equipment, ground-based equipment, or concepts/procedures, which are new to a particular operator, require approval. In addition, all CAT III operations at airports and runways new to a particular operator require approval even though previously approved aircraft, airborne equipment, ground-based equipment, concepts, and procedures are used in those operations. This section contains an amplification of the general concepts, policies, direction, and guidance covered in previous sections of this chapter. Specific standards are provided for inspectors evaluating CAT III AWTAs with airborne and ground-based equipment, which have well understood operational characteristics and limitations. In cases where an operator requests approval to conduct CAT III AWTAs using equipment, concepts, and/or procedures not addressed in these standards, a request for policy and guidance must be forwarded through the appropriate RFSD NextGen Branch (AXX-220) to the Flight Technologies and Procedures Division (AFS-400).

B. Types of CAT III Operations. The only types of CAT III operations that can be currently authorized (as of 2010) for use by U.S. operators are ILS based. CAT III operations using Global Positioning System (GPS) Landing Systems (GLS), which requires the use of a Ground Based Augmentation System (GBAS) or Local Area Augmentation System (LAAS), may also be approved in the near future.

C. Objective of CAT III Operations. The essential difference between CAT III AWTAs and CAT I and II operations is that a CAT III operation places a greater reliance on the guidance provided by the airborne and ground-based guidance equipment. The guidance provided by the equipment must continue through touchdown in CAT IIIa operations and through touchdown and rollout to a safe taxi speed in CAT IIIb operations. In contrast to other types of operations, CAT III operations do not ensure sufficient external visual cues for the pilot to manually control the aircraft during flare and landing. The primary objective of CAT III operations is to provide a level of safety equivalent to CAT I and CAT II operations without the use of these visual cues. The desired level of safety for CAT III operations is achieved by the following enhancements:

1) The airborne equipment and ground-based equipment must ensure increased precision in flightpath control. The increased reliability and precision of flightpath control (as compared to CAT I systems) is achieved through highly reliable and precise ground-based equipment and airborne systems. These systems are capable of guiding the aircraft with significantly increased precision to touchdown or through rollout, as appropriate.

2) The aircraft performance and equipment requirements associated with a missed approach from very low altitudes are enhanced to ensure that these operations can be safely

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conducted even if a momentary touchdown occurs on the runway after the go-around is initiated. Special criteria assures obstacle and terrain clearance to accommodate missed approaches from very low altitudes.

3) More stringent criteria are specified for the profile of the pre-threshold terrain to ensure that the flight guidance and control systems function properly during the final stages of approach, flare, and landing.

4) Surface Movement Guidance and Control Systems (SMGCS) are established to ensure the landing runway is protected from potential incursions and ensure the overall safety of the operation.

4-338 CAT III OPERATIONAL CONCEPTS. The weather and environmental conditions encountered in CAT III AWTAs severely restrict seeing-conditions. External visual reference is not acquired until the aircraft reaches a very low altitude. Typically, external visual references begin to become available below 100 feet. Even though external visual references are usually available before touchdown, the seeing-conditions are not sufficient for the pilot to consistently perform a safe, manual landing. Therefore, the aircraft must be controlled by instruments and special equipment throughout the approach, flare, and touchdown (deceleration for rotorcraft) in weather conditions as low as RVR 700 and through rollout to a safe taxi speed (air taxi or hover for rotorcraft) in weather conditions below RVR 700. Due to the reduced seeing-conditions and the hazards associated with a pilot's attempts to manually maneuver the aircraft to landing in those seeing-conditions, the precision of the flight guidance and control system and the overall precision of flightpath control must provide these capabilities.

A. DH and AH. There are substantial differences between the DH and AH concepts. All FP operations are conducted in accordance with the DH and RVR concepts. All FO operations are normally conducted in accordance with the AH and RVR concepts. DHs are only used with FO systems in very unique situations (refer to AC 120-28). DH and AH are never used together in any operation since the DH requires that external visual reference be established before passing a specified point and AH does not. The very limited seeing-conditions available in CAT III operations require additional criteria to ensure that an adequate level of safety is achieved and maintained when operating in this environment.

1) DH Operations. For FP operations using a DH, the pilot must arrive at a decision before passing the DH to either permit the flight guidance and control system to be used to touchdown or to execute a missed approach. For a DH operation, the external visual information, the instrument information, and the airborne system information must be integrated so the flightcrew can make a definitive decision no later than arrival at the DH. The decision to permit the flight guidance and control system to continue to direct the aircraft to touchdown must be based on an assessment that the airborne systems have not degraded in a way that affects FP capabilities, and the external visual cues (touchdown zone (TDZ) lighting) confirm that the aircraft will touchdown within the TDZ. Since all DHs used in CAT III operations must be 50 feet or less, the inner marker (IM) cannot be used to define the CAT III DH. Since DH 50 is located very near the runway threshold, the terrain profile within these areas is adequate for CAT III radio altimeter (RA)-based DHs. CAT III operations are normally conducted using

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a DH of 50 feet; however, a different DH may be operationally approved in special circumstances, such as the use of a hybrid CAT III landing system.

2) AH Operations. For operations with an AH, the pilot must also arrive at a decision, before passing the AH, to either permit the flight guidance and control system to be used to touchdown or to execute a missed approach. In direct contrast to operations with a DH, however, this decision must be based on an assessment that the airborne systems have not degraded in a way that affects FO capabilities. FO systems permit certain system failures below AH without requiring a missed approach, because the aircraft is still capable of continuing to a safe landing and rollout. External visual references are not required before touchdown in operations based on the AH concept.

B. Kinds of CAT III Operations. There are two different and distinct kinds of CAT III operations: FP operations and FO operations.

1) FP operations use a DH of 50 feet (15 meters) and a TDZ RVR no lower than RVR 600 (175 meters). In the event of a failure when using a FP CAT III system, the flight guidance and control system will not disturb the aircraft's flightpath when it fails, and the flightcrew immediately receives an aural and visual warning of system failure. Therefore, a DH must be used to ensure that, before passing 50 feet above ground level (AGL), the flightcrew establishes external visual reference with the TDZ to determine that the flight guidance and control system is functioning properly and to ensure that the aircraft will land within the TDZ. A go-around is mandatory if the flight guidance and control system fails before touchdown during FP operations in CAT III weather conditions.

2) FO operations usually use an AH instead of a DH (refer to AC 120-28). As the name implies, critical CAT III systems remain operational even if some failures occur. FO systems are designed so that the system remains fully operational following any failure or combination of failures that are likely to occur after the aircraft passes AH. Therefore, there is no requirement to establish external visual reference before touchdown to confirm that the aircraft will land safely. The lowest minimum that may currently be approved for any AWTA by a U.S. operator is RVR 300 (90 meters). This restriction is based on the difficulties associated with aircraft movement on the taxiways, ramps, and other maneuvering areas on the airport and the difficulties related to providing timely safety facilities and services (such as ARFF).

C. CAT III Operating Minimums. CAT III operating minimums are based on two criteria and are always the higher of the following minimums:

1) Published ILS Minimums. The part 97 Standard Instrument Approach Procedure (SIAP) criteria is based on the integrity and reliability of the ILS ground system. When the ILS supports operation to touchdown but not rollout, RVR 700 is the lowest authorized minimum. When the ILS supports both touchdown and rollout operations, RVR 600 minimums are typically published. If the ILS supports both touchdown and rollout operations and the Localizer (LOC) is monitored to an even higher standard of reliability, RVR 300 minimums may also be published.

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2) CAT III OpSpec/MSpec/LOA C060 Minimums. CAT III minimums in C060 are based on the certification statement in the Aircraft Flight Manual (AFM), and based on the airworthiness requirements contained in the appropriate revision of AC 120-28.

a) AC 120-28C Authorized Aircraft. Aircraft authorized under AC 120-28C and earlier typically contain a statement authorizing CAT IIIa or CAT IIIb automatic approach and landing operations.

1. Aircraft authorized for CAT IIIa are currently limited to RVR 700 for TDZ and RVR 700 for Mid Runway Rollout (MID) by regulation, unless the AFM also contain statements authorizing FP landing systems. The aircraft may then be authorized RVR 600 for TDZ, RVR 600 for MID, and RVR 300 for rollout.

2. Aircraft authorized for CAT IIIb with a rollout control system that meets the criteria in AC 120-28C, Appendix 2 (FP rollout system) may be authorized minimums as low as RVR 400 for TDZ, RVR 400 for MID, and RVR 300 for rollout.

3. Aircraft authorized for CAT IIIb with a rollout control system that meets the criteria in AC 120-28C, Appendix 3 (FO rollout system) may be authorized minimums as low as RVR 300 for TDZ, RVR 300 for MID, and RVR 300 for rollout.

b) AC 120-28D Authorized Aircraft. Aircraft authorized under AC 120-28D or subsequent revisions contain a statement authorizing FP or FO landing and/or rollout control systems.

1. FP Landing System without Rollout System. Aircraft with an FP landing system without a rollout system may be authorized minimums as low as RVR 600 for TDZ, RVR 600 for MID, and RVR 300 for rollout.

2. FP Landing System with Any Rollout System. Aircraft with a FP landing and rollout system may be authorized minimums as low as RVR 600 for TDZ, RVR 400 for MID, and RVR 300 for rollout.

3. FO Landing System with a FP Rollout System. Aircraft with an FO landing system and FP rollout systems may be authorized minimums as low as RVR 400 for TDZ, RVR 400 for MID, and RVR 300 for rollout RVR.

4. FO Landing System with a FO Rollout System. Aircraft with FO landing and rollout systems may be authorized minimums as low as RVR 300 for TDZ, RVR 300 for MID, and RVR 300 for rollout RVR.

4-339 RA AND PRE-THRESHOLD TERRAIN.

A. Operation. The operation of almost all CAT III landing systems is dependent on RA information during the latter stages of the landing. The flare profile, the rate of descent at touchdown, and the distance of the touchdown point from the threshold can be adversely affected by the profile of the terrain immediately before the landing threshold. The terrain, which is most critical, lies in an area approximately 200 feet on either side of the runway centerline (RCL)

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extended from the threshold into the approach area to a distance of approximately 1,000 feet before the landing threshold.

B. Pre-threshold Terrain. At runways where the terrain beneath the approach flightpath is not approximately level, abnormal autopilot (AP) and/or flight director (FD) behavior may result from erroneous RA signals. Irregularities in the pre-threshold terrain can have a major effect on the performance of the landing systems required for CAT III operations (autoland or Head-Up Display (HUD) to touchdown). A special operational test and evaluation program is required before approving any CAT III operations for any aircraft on these runways. This test program is essential to ensure that CAT III operations can be safely conducted on these runways with a particular CAT III aircraft type (aircraft with similar flight characteristics and similar flight guidance and control systems). This special test and evaluation must be accomplished in nonrevenue service.

C. Requests for Evaluation. All requests to conduct this evaluation must be sent to the RFSD NextGen Branch (AXX-220) for approval. Inspectors shall not, under any circumstances, authorize any CAT III operations with any aircraft to these runways unless that particular CAT III type aircraft has been specifically evaluated in accordance with AC 120-28 and specifically approved for that operation by the RFSD. The Flight Operations Branch (AFS-410) maintains a list of these special terrain runways which must be authorized in OpSpec/MSpec/LOA C059 and/or C060 to utilize any CAT II/III minimums that require the use of autoland or HUD to touchdown. This document lists all CAT II/III special terrain runways in the United States, as well as all approved aircraft make, model, and series (M/M/S) for each runway. This list is available on the AFS-410 public Web site at http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs400/afs410/status_lists/. See Volume 4, Chapter 2, Section 2 and AC 120-28 for more information about authorizing CAT II/III operations at special terrain runways.

D. Runways. A few CAT II runways currently have restrictions (i.e., Radio Altitude minimums Not Authorized (RA NA)) due to the pre-threshold terrain profile, which prohibits the use of RA information to determine the CAT II DH. Standard CAT II operations (DH 100 and RVR 1200) can still be conducted by using the IM to determine arrival at the DH. Although the RA cannot be used to accurately and reliably determine arrival at the CAT II DH (height above touchdown (HAT) 100), it may still be possible to safely conduct CAT III operations to these runways if the pre-threshold terrain does not adversely affect the performance of the CAT III landing system. For example, Pittsburgh International Airport (KPIT) runway 10L has a CAT II approach with “RA NA” minimums (RA DH not authorized), but certain aircraft have been approved for CAT III autoland operations.

4-340 FUTURE REDUCTIONS TO LANDING MINIMUMS. The lowest landing minimum currently authorized for CAT III operations by U.S. operators at any airport and by foreign air carriers in the United States is RVR 300. This restriction is related primarily to problems associated with aircraft taxi operations and the difficulty of providing adequate safety services (such as crash, fire, rescue, and collision prevention) when operating in seeing-conditions less than RVR 300. The lowest minimum currently authorized for foreign air carriers outside the United States is 75 meters (RVR 300) and is based on an operational determination similar to the U.S. RVR 300 decision. Future reductions in landing minimums are unlikely until technology

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permits the development of economically viable capabilities to adequately resolve these limitations. Presently potential solutions appear to be enhancements in airborne equipment such as forward-looking infrared or millimeter wave radar technologies.

4-341 FOREIGN CAT III INSTRUMENT APPROACH PROCEDURES (IAP).

A. Operations. All CAT III operations by U.S. operators at foreign airports must be authorized in accordance with the guidance and direction in this order. All foreign runways approved for CAT III operations by U.S. operators must also meet the requirements of this order and the current edition of FAA Order 8260.31, Foreign Terminal Instrument Procedures.

B. Foreign Equivalence. Although it is recognized that the CAT III ground-based systems and procedures at foreign airports may not be in exact accordance with U.S. standards, it is critical for the foreign airports to provide the information and functions that are necessary for CAT III operations in a manner consistent with the intent of U.S. CAT III standards.

C. General. The FAA region, which has surveillance responsibility for a particular foreign airport, has the responsibility for evaluating any runway at that airport which supports CAT III operations. The controlling region is also responsible for evaluating these CAT III runways in accordance with Order 8260.31 and for recommending approval or disapproval of CAT III operations to those runways. The controlling region's recommendations must be forwarded to AFS-400 for further evaluation and final approval or disapproval.

NOTE: Foreign runways that have been determined to be equivalent to U.S. CAT III standards and approval for CAT III operators are identified in the list of runways maintained by AFS-400. Operators desiring CAT III approvals at foreign airports that are not on this approved list should submit a request for evaluation and approval through their principal operations inspector (POI) to the RFSD NextGen Branch. The controlling region's NextGen Branch will conduct an evaluation. Upon successful completion of the evaluation, the NextGen Branch will notify AFS-400 for final approval and addition to the approved list.

D. Determining Equivalence. The major factor that is considered by the controlling region in approving foreign runways in accordance with Order 8260.31 for CAT III operations by U.S. operators is the degree of equivalence with U.S. CAT III standards. This determination evaluates the equivalence of:

- High-intensity approach lights;
- High-intensity runway edge lights;
- TDZ and RCL lights;
- Taxiway edge lights;
- High-intensity taxiway centerline lights;
- Runway markings;
- The quality and integrity of the approach and landing ground-based guidance system;
- The RVR reporting capabilities and procedures;
- ILS critical areas, including signs and markings;

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- Obstacle clearance protection in the approach and missed approach, including the obstacle-free zone;
- Airport surface traffic control;
- Terminal area air traffic control (ATC); and
- Procedures for regulating the ground movement of aircraft and vehicles during CAT III operations.

E. Authorizing Foreign CAT III Runways. All CAT III operations conducted in foreign countries must be conducted in accordance with the operator's CAT III OpSpecs. The only means of approving these operations is through the issuance of OpSpecs, which specify the foreign runways and minimums authorized for each aircraft used by the operator. OpSpecs C060 and H109 specify the CAT III IAPs, runways, operating minimums, limitations, and aircraft authorized for CAT III operations for a particular operator. These paragraphs also specify the CAT III airborne equipment, RVR equipment, pilot qualification, and missed approach requirements that apply to the operator's CAT III operation. If the flightcrew is properly qualified and the aircraft is properly equipped and maintained, an operator can, in general, be authorized to conduct CAT III AWTAs to any foreign runway approved for CAT III operations. The exception to this are those runways specified as restricted CAT III runways. The criteria in AC 120-28 and this order establish the lowest approach and landing minimums that can be authorized, under any circumstances, for CAT III operations. The lowest minimums for each kind of CAT III operation for a particular operator are specified in OpSpecs C060 and H109, as appropriate. FAA inspectors shall not authorize an operator to use minimums lower than these values. Additionally, inspectors shall not authorize the use of CAT III minimums for any foreign runway unless the provision of this order and Order 8260.31 are met.

4-342 CAT I AUTOLAND OR HUD TO TOUCHDOWN OPERATIONS. Autoland or HUD to touchdown operations are required for all CAT III operations, and many operators use autoland or HUD for CAT II, CAT I, and visual flight rules (VFR) operations as well. Part 121, § 121.579(c); part 125, § 125.329(d); and part 135, § 135.93(d) prohibit the use of autoland or HUD to touchdown in any operation unless the operator is specifically authorized via OpSpecs. OpSpec C059 and C060 authorize autoland or HUD to touchdown in CAT II and CAT III operations, respectively. OpSpec C061 or H110 authorizes autoland operations in other than CAT II/III operations and OpSpec C062 or H111 authorizes HUD to touchdown in other than CAT II/III operations.

A. ILS Category Classification. The ILS category classification system provides a more comprehensive method of describing ILS performance than the simple CAT I/II/III classification. ILS facility classification is described in Order 6750.24. A facility's classification is defined by using two characters (I/C, II/D, III/E, etc.).

1) The first character indicates conformance to the facility performance category standards. This character indicates if the ground equipment is classified as a CAT I, CAT II, or CAT III ILS.

2) The second character defines the ILS point (Figure 4-21A, Localizer Course and Glidepath Bend Amplitude Limits) to which the LOC conforms to the Facility Performance CAT

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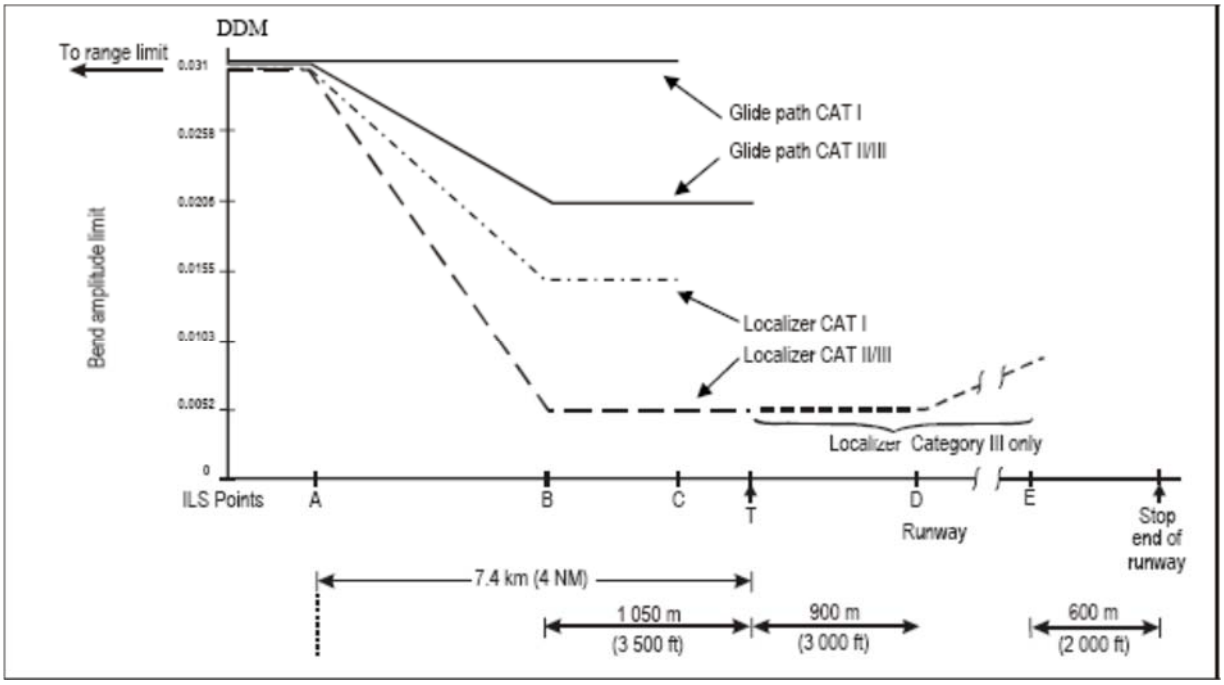
III course structure tolerances. These classifications indicate ILS conformance to a physical location on the approach or runway as follows:

- A: 4 NM before the threshold.
- B: 3,500 feet before the threshold (CAT I decision point).
- C: Glidepath altitude of 100 feet height above threshold (HATh) (CAT II decision point).
- T: Threshold.
- D: 3,000 feet beyond the threshold (CAT III requirement only).
- E: 2,000 feet before the runway end (CAT III requirement only).

Figure 4-21A. Localizer Course and Glidepath Bend Amplitude Limits



B. Use of Autoland at U.S. CAT I Facilities or Equivalent. For CAT I, autoland may typically be used at runways with facilities other than those with published CAT II or III IAPs. This is to aid pilots in achieving stabilized approaches and reliable touchdown performance to improve landing safety in adverse weather; for CAT II or III training; to exercise the airborne system to ensure suitable performance; for maintenance checks; or for other such reasons. Use of this capability may be particularly important for pilot workload relief in stressful conditions of fatigue after long international flights; night approaches; crosswinds or turbulence; when there may be other aircraft non-normal conditions being addressed; or to aid safe landing performance in otherwise adverse weather, in restricted visibility, or with cluttered runways. This is true even though reported visibility may be well above minimums (e.g., heavy rain distorting view out the windshield, snow covered runways where markings are not easily visible, etc.).

C. ILS Classification and CAT I Autoland Operations. ILS classification is being added to the Airport/Facility Directory (A/FD), but not all ILS runways are included as of

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August 2010. To support autoland or HUD to touchdown operations, CAT III course structure tolerances to at least point D are preferred (e.g., I/D, II/D, III/D). In 2010, all published CAT II and III approaches in the United States meet this standard. CAT II approaches that do not support autoland operations will note this limitation via a chart note or Notice to Airmen (NOTAM). When conducting autoland operations on a CAT I runway/ILS, runways with a I/D or I/E classification are the most suitable and are preferred. Practice autoland or HUD to touchdown operations may be conducted at CAT I runways in CAT I or better weather conditions where the facility classification is unknown, because the flightcrew is monitoring system performance, visually verifying the position of the aircraft, and can determine whether to continue to a landing or execute a missed approach in CAT I or better weather conditions. Though it is not recommended, flightcrew monitoring and increased visibility also permits practice autoland or HUD to touchdown operations using an ILS classified as I/A, I/B, I/C, or I/T, provided the operation is performed in VFR conditions. The FAA maintains an information-only list of ILS classification status at http://avnwww.jccbi.gov/pls/datasheet_prd/PRO_ilsperform_rpt.

D. Pre-Threshold Terrain.

1) AFS-410 maintains a list of CAT II/III runways with special terrain which may affect autoland or HUD to touchdown operations, such as irregular pre-threshold terrain or TDZ slope. This list is available at http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs400/afs410/status_lists/. Each operator and aircraft must be approved for each special terrain runway to conduct any CAT II or III operations using autoland or HUD to touchdown. Volume 4, Chapter 2, Section 2 contains more information about how to authorize CAT II/III operations at special terrain runways.

2) The FAA does not analyze CAT I runways to determine if any irregular pre-threshold terrain will impact autoland or HUD to touchdown operations. Practice autoland or HUD to touchdown operations may be conducted at CAT I runways where the pre-threshold terrain has not been analyzed because the flightcrew is monitoring system performance, visually verifying the position of the aircraft, and can determine whether to continue to a landing or execute a missed approach in VFR conditions. All operators approved to use autoland- or HUD-equipped aircraft should be encouraged to routinely use these systems at suitably equipped runways during operations in VFR and in CAT I instrument flight rules (IFR) conditions. Flightcrew training should emphasize the importance of monitoring equipment performance on all practice autolands.

E. Maintenance Return to Service and Required Practice Autolands. An aircraft manufacturer and certification requirements may require that a practice autoland or HUD to touchdown be performed on a published CAT II or III approach. If so, the operator should adhere to these requirements. If autoland is not required to be performed on a CAT II ILS, it is important to note that an unsatisfactory approach is extremely difficult to attribute to small errors in ILS ground equipment. Even CAT I ILS facilities that meet CAT III signal standards are not monitored to the same tolerances as CAT II/III facilities. An unsatisfactory approach due to a critical error incursion is something that may be identified, but an unsatisfactory approach due to a signal or monitor error cannot be detected by the flightcrew or maintenance.

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F. Flightcrew Training. In addition to other training requirements, flightcrew training should emphasize the importance of:

1) Monitoring equipment performance and visual verification of aircraft position on all practice autolands.

2) Verifying that the CAT I approach does not have any charted restrictions, which would prohibit autoland or HUD to touchdown operations ("ILS unusable within 0.5 DME," "autopilot coupled approach not authorized below XXX feet").

3) Requesting that ATC protect the critical area for all practice autolands. ATC will protect the ILS critical areas if the ceiling is less than 800 feet and/or the visibility is less than 2 miles.

4) Performing maintenance return to service as required by either the manufacturer, certification, or the operator, as described in subparagraph 4-342E.

4-343 CAT II/III ILS OUTAGES AND CONTINUITY OF SERVICE (CoS) REQUIREMENTS.

A. Purpose. CAT II/III operations rely on high-integrity LOC and glideslope (GS) signals with a low probability radiated signal interruption (CoS). ILS design and approval criteria address required system integrity. The current edition of FAA Order JO 6750.57, Instrument Landing System Continuity of Service Requirements and Procedures, contains the policy and requirements for Technical Operations (Tech Ops) to meet CoS requirements for CAT II/III ILS facilities, including CAT II/III ILS downgrade and reinstatement criteria. The RFSD NextGen Branch (AXX-220) is the Flight Standards Service (AFS) point of contact (POC) for ILS CoS issues. AFS-400 is responsible for ILS CoS policy, guidance, and support. This section summarizes ILS CoS requirements relevant to inspectors and summarizes some of the relevant Tech Ops requirements. Refer to Order JO 6750.57 for current ILS CoS criteria, Order 6750.24, and Order 8400.13 for current AFS ILS facility requirements.

B. Definitions.

1) Continuity of Service (CoS). The quality that relates to the rarity of radiated signal interruptions. The level of CoS of the LOC or the glidepath is expressed in terms of the probability of not losing the radiated guidance signals.

2) CoS Outage. Any reportable LOC or GS unscheduled interruption for which there was an unexpected cessation of the radiated signal, regardless of cause, or any failure of a LOC or GS to properly initiate radiation, such as when an ILS fails to radiate upon a runway interlock selection.

3) CoS Mean Time Between Outages (MTBO). Average number of hours between countable CoS outages, considering only the last five in-service periods. This MTBO calculation does not include consideration of all interruptions as is typical in National Airspace Performance Reporting System (NAPRS) reporting. Rather, it represents the MTBO outlined in International Civil Aviation Organization (ICAO) Annex 10.

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4) Instrument Landing System (ILS) CoS Office of Primary Responsibility (OPR). A single, functional entity within the technical services organization of each service area, consisting of one or more designated ILS experts. The ILS CoS OPR is responsible for analyzing and monitoring ILS CoS throughout the entire service area and recommending actions to best ensure that MTBO requirements are met.

5) Predicted MTBO. The CoS MTBO if an outage occurred at the time of the calculation.

6) Projected MTBO. The CoS MTBO projected out 3 months from the predicted MTBO.

C. ILS Outage and Downgrade Requirements. Tech Ops maintains a comprehensive database, which contains the outage history and up-to-date MTBO for all ILS facilities in the United States. Order JO 6750.57 requires an ILS facility to be downgraded based on the number of outages in the preceding 6 months. As a result, Tech Ops and Navigation Services escalate their priorities and involvement in repairs at facilities that accrue multiple outages over a short period of time.

1) When Tech Ops downgrades a facility, the corresponding ILS landing minimum is also taken out of service via NOTAM:

a) Fourth outage in the preceding 6 months: CAT III RVR 300 minimum not authorized.

b) Fifth outage in the preceding 6 months: All CAT III minimums not authorized.

c) Sixth outage in the preceding 6 months: All CAT II and CAT III minimums not authorized.

2) This outage count applies to the separate LOC and GS systems, not the sum of the outages for each system. For example, a LOC which has its fifth outage in the preceding 6 months will lose all CAT III minimums. An ILS with three LOC outages and three GS outages is not downgraded, because neither the LOC nor the GS individually have four or more outages in the preceding 6 months. (See Table 4-8, Outage Consequences.)

3) Order JO 6750.57 is clear that downgrades are required as a result of excessive outages in the preceding 6 months. Tech Ops will notify the appropriate NextGen Branch (AXX-220) of a downgrade due to outages, and will not waive any ILS downgrade requirements except as allowed in Order JO 6750.57. Due to the strong emphasis on system reliability to support CAT II/III landing operations, the RFSD NextGen Branch should not consider waivers to ILS downgrades as a result of excessive outages.

D. ILS Reinstatement After a Downgrade. To reinstate an ILS landing minimum, Tech Ops repairs the ILS facility, verifies CAT II or III capability (as applicable), and first restores CAT I landing minimums. After the system demonstrates sufficient reliability by operating outage free for a fixed period of time, lower landing minimums are then reinstated as

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authorized in Order JO 6750.57. After any downgrade, the ILS must operate without an outage for 4 weeks to restore the next lower landing minimum. To restore each additional lower landing minimum, the system must operate outage free for an additional 2 weeks for each minimum to reinstate. See Table 4-8A, Instrument Landing System Reinstatement Periods, for examples of ILS reinstatement after a downgrade.

E. MTBO Requirements. Unlike downgrades as a result of excessive outages in the preceding 6 months, Order JO 6750.57 does not require a downgrade if a LOC or GS MTBO falls below the hours required in Order 6750.24 and Order 8400.13. Instead, a downgrade is at the discretion of AFS, in coordination with Tech Ops. This is because MTBO is very useful as a trend analysis number, but averaging the time periods between outages can be misleading in specific circumstances.

1) The calculation of MTBO is the average number of hours between countable CoS outages, considering only the last five in-service periods, as shown in Figure 4-22, Active Periods Between Outages.

2) While MTBO provides a very useful tool for trend analysis, very large or very small numbers can skew the entire MTBO up or down respectively. Table 4-8B, Mean Time Between Outages—False Positive, and Table 4-8C, Mean Time Between Outages—False Negative, show an example of MTBO depicting a false positive and false negative when considering the reliability of an ILS component.

a) In Table 4-8B, a very large outage-free Period 5 raises the MTBO on a system which has incurred four outages in the preceding 500 hours of operation. Four outages in 500 hours clearly shows faltering reliability, but the MTBO figure itself shows a system suitable for CAT III RVR 600 operations. If this system has one more outage, the 10,000-hour period would no longer be in the preceding five periods, and the MTBO will drop substantially.

b) In Table 4-8C, the MTBO is decreased by four short periods caused by four outages over a 300-hour period. However, the system has operated for 3,700 hours without an outage, showing a strong indication that those problems have been repaired and increased system reliability. To get an MTBO of 4,000 hours in Table 4-8C, the system would have to operate for an additional 16,000 hours without an outage (20,000 total hours divided by five outage periods).

3) Therefore, when Tech Ops informs the appropriate NextGen Branch (AXX-220) of predicted or projected MTBO that do not meet the requirements in Order 6750.24 and may require a downgrade, it is important to discuss the facility's history, factors which may be affecting MTBO, outages which were attributed to a common cause, repair history, trends affecting the MTBO, and the technician's confidence in both the repairs and the reliability of the system. When in doubt, the All Weather Operations Specialist (AWOS) should consult AFS-410 before making a decision to downgrade the ILS.

F. CoS Analyze. Navigation Services created and maintains the CoS Analyze program, which tracks all ILS facilities (LOC and GS) in the United States, including outage history, MTBO, and repair information. CoS Analyze is available to AWOSs at

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http://cos.amc.faa.gov/cos/. CoS Analyze can be used by AFS inspectors to track ILS outages and MTBO for their specific region. The ILS CoS OPRs have usage rights within the CoS Analyze software to mitigate or exclude outages, add comments, and provide updates to system downgrade status. All of this information is available to other users on a read-only basis.

Figure 4-22. Active Periods Between Outages

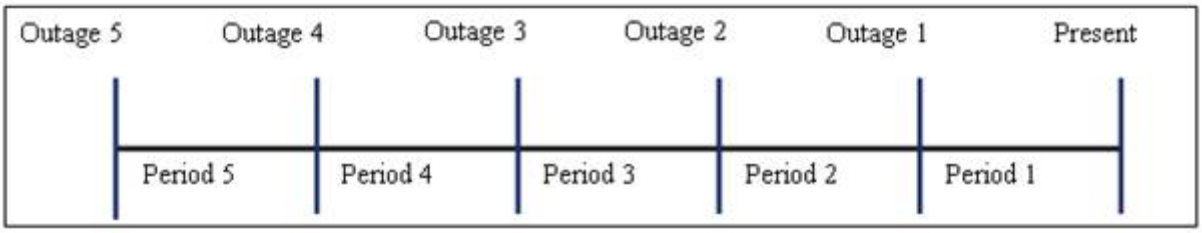

Table 4-8. Outage Consequences

Lowest ILS Minimum	Fourth Outage	Fifth Outage	Sixth Outage
CAT III RVR 300	CAT III RVR 300 N/A	CAT III N/A	CAT II/III N/A
CAT III RVR 700/600	No effect	CAT III N/A	CAT II/III N/A
CAT II	No effect	No effect	CAT II N/A

Table 4-8A. Instrument Landing System Reinstatement Periods

Lowest ILS Minimum	Downgraded Minimum Due to System Outages	Outage Free Period to Restore CAT II	Outage Free Period to Restore RVR 700 or 600	Outage Free Period to Restore RVR 300
CAT III RVR 300	CAT I	4 weeks	2 weeks (6 total)	2 weeks (8 total)
CAT III RVR 300	CAT II	N/A	4 weeks	2 weeks (6 total)
CAT III RVR 300	CAT III RVR 700 or 600	N/A	N/A	4 weeks
CAT III RVR 700 or 600	CAT I	4 weeks	2 weeks (6 total)	N/A
CAT III RVR 700 or 600	CAT II	N/A	4 weeks	N/A
CAT II	CAT I	4 weeks	N/A	N/A

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Table 4-8B. Mean Time Between Outages—False Positive

	Period	**Hours**
	Period 1	200
+	Period 2	100
+	Period 3	150
+	Period 4	50
+	Period 5	10000
	Total Hours =	**10500**
	MTBO =	**2100**

Table 4-8C. Mean Time Between Outages—False Negative

	Period	**Hours**
	Period 1	3700
+	Period 2	125
+	Period 3	75
+	Period 4	50
+	Period 5	50
	Total Hours =	**4000**
	MTBO =	**800**

RESERVED. Paragraphs 4-344 through 4-360.

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VOLUME 4 AIRCRAFT EQUIPMENT AND OPERATIONAL AUTHORIZATION

CHAPTER 14 GENERAL OPERATING AND FLIGHT RULES—MAINTENANCE ISSUES

Section 3 Reserved

RESERVED. Paragraphs 4-1401 through 4-1425.

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VOLUME 5 AIRMAN CERTIFICATION

CHAPTER 3 AIRLINE TRANSPORT PILOT (ATP) CERTIFICATION UNDER TITLE 14 CFR PART 121, 135, OR 91 SUBPART K

Section 5 Oral and Flight Test Events in Helicopters for ATP Applicants Engaged in Operations Under Title 14 CFR Part 121, 135, or 91 Subpart K

5-906 DESCRIPTION OF SPECIFIC EVENTS. Inspectors and examiners should use the ATP/Type Rating Oral Test Job Aid—Helicopter and the ATP/Type Rating Flight Test Job Aid—Helicopter checklists when conducting oral and flight tests (see Figures 5-120 and 5-121). The events required on these tests are listed on the job aids. In the paragraphs that follow, the conditions and techniques for presenting selected events are provided for the purpose of increasing standardization, reliability, and validity of the flight test process for helicopters.

5-907 WAIVER OR MODIFICATION OF FLIGHT TEST EVENTS. Title 14 of the Code of Federal Regulations (14 CFR) part 61, § 61.163(a) authorizes inspectors and examiners to modify or waive the events specified by part 61, appendix B, to ensure reasonable and safe use of the helicopter during flight. Inspectors and examiners should not waive an event for convenience, but shall not hesitate to use the waiver authority for the purpose of safety.

5-908 PREPARATION AND SURFACE OPERATION EVENTS. An applicant shall be observed performing the inspection of the helicopter interior, exterior, and emergency equipment while performing engine-start, taxi, and powerplant checks in accordance with the operator's aircraft operating manual.

A. Exterior Inspection. The exterior inspection is not an extension of the oral phase in which systems knowledge is examined, but is a demonstration of an applicant's ability to perform a safety check. Inspectors and examiners shall limit questions to those necessary for determining whether an applicant can recognize components that are in an unsafe condition. The inspector or examiner shall determine whether the applicant inspects these items in accordance with the procedures in the operator's aircraft operating manual.

B. Cockpit Preflight Inspection. An applicant shall be required to complete the cockpit preflight check following the procedures in the operator's aircraft operating manual while using the appropriate checklist. An applicant should be asked to demonstrate the use of the minimum equipment list (MEL) and to conduct a passenger briefing. In helicopters requiring more than one pilot, the proper challenges and responses to the checklist must be used.

C. Engine-Start and Rotor Engagement. The applicant shall be required to perform an engine-start and rotor engagement using the correct procedures. Simulated problems may be introduced and should be carried through to the expected conclusion in line operations for the purpose of evaluating crew coordination and the applicant's proficiency.

D. Taxiing or Surface Hover. The inspector or examiner shall evaluate the applicant's ability to safely maneuver the helicopter in proximity to the surface while managing outside vigilance and accomplishing cockpit procedures. The applicant must ensure that the taxi path is

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clear of obstructions, comply with local taxi rules and control tower instructions, make proper use of checklists, and maintain control of the helicopter and crew.

E. Powerplant Checks. Powerplant checks must be accomplished before takeoff in accordance with the operator's aircraft operating manual.

5-909 TAKEOFF EVENTS. The applicant must accomplish each of the following takeoff events. These events may be combined when convenient and practical.

A. Normal Takeoff. A normal takeoff is defined as a takeoff beginning from a standing position on the surface or from a stabilized hover and not accompanied by an engine failure or malfunction during the takeoff or initial climb phase.

B. Instrument Takeoff. An instrument takeoff is defined as one in which instrument conditions are encountered or simulated at or before reaching an altitude of 100 feet above the airport elevation. The applicant shall be evaluated on control of the helicopter including transition to instruments as visual cues deteriorate. The applicant must also be evaluated on planning for the transition to an instrument navigation environment. This event may be conveniently combined with an area departure.

C. Engine Failure on Takeoff. The applicant must demonstrate the ability to maintain control of the helicopter with the simulated failure of a powerplant.

1) In single-engine helicopters, this event shall consist of a simulated power loss at a point (no lower than 500 feet above ground level (AGL)) requiring a descent to a location other than the departure point. This event need only be continued to a point where the inspector or examiner can make a determination of the applicant's proficiency. The event shall be terminated in a power recovery. This is a potentially hazardous event and shall be presented in a realistic manner that is consistent with safety. Inspectors shall exercise care when introducing the simulated engine failure at a reasonable airspeed and altitude, and give ample consideration to the helicopter's characteristics, length of landing area, surface conditions, wind direction and velocity, and any other pertinent factors that may adversely affect safety. Inspectors and examiners shall not introduce a simulated power failure in a single-engine helicopter in an area where an actual touchdown could not be completed safely, should it become necessary.

2) In multiengine helicopters, the applicant shall demonstrate the ability to safely continue a takeoff with simulated failure of a powerplant at an airspeed that permits continued climb in forward flight.

3) Helicopter configuration, airspeed, and operational procedures shall be as recommended in the operator's aircraft operating manual.

D. Rejected Takeoff. A rejected takeoff is a potentially hazardous event. It should be presented in a realistic manner; however, it must be consistent with safety.

1) In single-engine helicopters, inspectors and examiners shall introduce a simulated problem so that a quick stop is required. Inspectors and examiners shall not introduce a simulated powerplant failure when testing this event in a single-engine helicopter. Instead, this event might

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be introduced by requesting the applicant to climb over a simulated obstacle on takeoff. Once the takeoff is in progress, the inspector or examiner can then inform the applicant that the climb will not clear the simulated obstacle.

2) In multiengine helicopters, inspectors and examiners shall introduce a problem requiring an abort before the helicopter reaches a speed at which the helicopter is committed to takeoff.

3) Inspectors and examiners shall take precautions to introduce the simulated failure at a reasonable airspeed and altitude, giving due consideration to the helicopter's characteristics, length of landing area, surface conditions, wind direction and velocity, and any other pertinent factors that may adversely affect safety.

NOTE: The performance characteristics of some nontransport helicopters may make the introduction of a simulated engine failure on takeoff a potentially hazardous situation. When conducting a flight test in such helicopters, inspectors and examiners should use their authority to waive or modify this event.

E. Crosswind Takeoff. A crosswind takeoff from a standing position on the surface or a stabilized hover must be evaluated on all flight tests. When appropriate, a crosswind takeoff may be evaluated simultaneously with other types of takeoffs.

5-910 CLIMB, EN ROUTE, AND DESCENT EVENTS.

A. Area Departures and Arrivals. The area departure and arrival events include intercepting radials, tracking, and climbs or descents with restrictions. When practical, a standard instrument departure or standard arrival should be used; however, many published procedures are not suitable for testing an applicant's abilities. For example, common radar departures are essentially initial climb instructions for a radar hand-off. If a suitable published procedure is not available and circumstances permit, the inspector or examiner shall give a clearance that presents the desired tasks. Inspectors and examiners should allow applicants full use of all installed equipment. The applicant's use of navigation equipment, use of other crewmembers, and adherence to air traffic control (ATC) clearances and restrictions shall be evaluated.

B. Holding. Inspectors and examiners should give holding clearances with adequate time available for the applicant to identify the holding fix, select the appropriate speed, and plan the entry. Applicants should be allowed the use of all aids normally available in the cockpit (such as wind drift readouts). At least the initial entry and one complete turn in the holding pattern should be completed before another clearance is issued. The applicant's performance shall be evaluated on the basis of compliance with the holding procedures outlined in the operator's aircraft operating manual, compliance with instructions issued by ATC, and the published holding criteria. Holding airspeed must be as specified by the operator's aircraft operating manual.

C. Steep Turns. This event consists of a level turn in each direction with a bank of 30 degrees, continuing for at least 180 degrees, but not more than 360 degrees. Airspeed, altitude, and bank angle must be controlled within the tolerances specified in the current edition of FAA-S-8081-5, Airline Transport Pilot and Aircraft Type Rating Practical Test Standards for

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Airplane. Inspectors and examiners shall direct special attention to an applicant's smoothness, coordination, and orientation.

D. Unusual Attitude Recovery. An unusual attitude recovery shall be given at an altitude consistent with a safe recovery by the safety pilot, if the applicant is unable to make a proper recovery. The applicant must recognize the helicopter's attitude and respond correctly. Inspectors and examiners shall observe the minimum altitudes specified for this event in the operator's aircraft operating manual.

E. Settling with Power. The applicant must recognize and initiate immediate recovery from a critical rapid descent with power. For purposes of this maneuver, settling is reached when a perceptible buffet is felt or an indication of immediate settling is detected. If this event is prohibited in the operator's aircraft operating manual, it shall not be conducted in flight, but shall be tested orally.

F. Specific Flight Characteristics. This event consists of recovery from flight characteristics that are specific to the helicopter type. These specific flight characteristics, when applicable, are specified in the Flight Standardization Board (FSB) report for the particular helicopter type. The inspector or examiner shall evaluate the applicant on recognition and recovery from the specific flight characteristic, when applicable. The procedures used for recovery must be those specified in the operator's aircraft operating manual.

5-911 APPROACHES TO LANDINGS. The approaches described below are required on all flight tests but may be combined, when appropriate.

A. Instrument Landing System (ILS) Approaches. Inspectors and examiners shall require applicants to fly a minimum of one normal, all engines operative, ILS. In addition, when multiengine helicopters are used, one manually controlled ILS with an accompanying powerplant failure is also required.

1) When the operator's aircraft operating manual requires the use of a flight director, the flight director must be used during the manually controlled ILS approaches. If the manually controlled ILS approach is flown using a flight director, a raw data approach is not required to complete the flight test. When the flight director is used on an ILS approach, the applicant shall be required to use a decision height (DH) of 100 feet above the touchdown zone (TDZ). The DH shall be determined by the barometric altimeter. Inspectors and examiners shall ensure that the applicant is aware that this DH is for flight test purposes only and does not correlate to any minimums used in actual operations.

2) If the operator's aircraft operating manual permits the conduct of raw data ILS approaches, the operator must train applicants on the use of raw data for controlling the aircraft during the approach. In this case, the flight director must be used on at least one manually controlled ILS approach. While a raw data approach is not required to complete the flight test, inspectors and examiners should occasionally require a raw data approach to determine whether the operator's training program is adequately preparing applicants. For raw data ILS approaches, the inspector or examiner shall require the applicant to use a DH of 200 feet above the TDZ. The

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inspector or examiner shall ensure that the applicant is aware that this DH is for flight test purposes only and does not correlate to any minimums used in actual operations.

3) When the operator's helicopters are equipped with autopilot couplers, at least one coupled autopilot ILS approach shall be flown. If the autopilot has the capability and the operator is authorized by operations specifications (OpSpecs) to conduct automatic landings, the coupled approach shall terminate in either an autolanding or a coupled-missed approach. When the flight test is conducted in a multiengine helicopter, the autopilot-coupled approach may be combined with the normal ILS (all engines operative) approach. This combination is permitted because the applicant's ability to manually control an ILS approach is evaluated on the ILS with an engine out.

4) The vision restriction device must remain in use until just before the helicopter arrives at the DH used for the flight test.

5) Flightcrew procedures, helicopter configuration, and airspeeds must be as specified by the operator's aircraft operating manual. During each phase of the approach, the airspeed must not deviate from the target speed by more than the tolerances specified in the practical test standards (PTS). The inspector or examiner shall ensure that the applicant is aware that this DH is for flight test purposes only and does not correlate to any minimums used in actual operations. If the flight test is being conducted in actual weather conditions, the DH shall be the published DH.

B. Nonprecision Approaches. The inspector or examiner shall require the applicant to demonstrate two different types of manually-controlled nonprecision instrument approaches authorized by the operator's OpSpecs.

1) The inspector or examiner shall allow the applicant to use any aid usually available in the cockpit, such as flight director, drift, and ground speed readouts. Some operators train their pilots to perform nonprecision approaches using the autopilot. While this training should be encouraged, at least one nonprecision approach must be manually flown on the flight test.

2) The vision restriction device shall remain in place until the helicopter arrives at minimum descent altitude (MDA) and a distance from the runway approximating the required visibility for the approach.

3) Applicants must remain within the tolerance established for terrain clearance. Also, at the visual descent point or its equivalent, the aircraft must be in a position that it can be aligned with the runway without excessive maneuvering.

C. Circling Approach Maneuver. To qualify as a circling approach for flight test purposes, the procedure to be flown must require a change in heading from the final approach course to the runway heading of at least 90 degrees. This event may be waived if local conditions, beyond the control of the applicant (traffic or available approaches), prevent it from being conducted in a realistic manner.

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1) The inspector or examiner may modify the event. For example, with the tower's approval, the visual maneuver portion of the event could be entered from a modified visual flight rules (VFR) traffic pattern at a point downwind and abeam the touchdown point.

2) The angle of bank for a circling maneuver should not exceed 30 degrees. Altitude and airspeed must not exceed the tolerances specified in the PTS. The helicopter shall not descend below MDA until the runway environment is clearly visible to the applicant, and the helicopter is in a position for a normal descent to the touchdown point.

5-912 LANDING EVENTS. The following landings are required but may be combined when appropriate:

A. Normal Landing. A normal landing is defined as an approach to a stabilized hover or a touchdown, with normal power available. A normal landing can be accomplished from either a visual pattern or from a nonprecision approach.

B. Landing in Sequence from an ILS Approach. On the landing from an ILS approach, the runway environment should become visible to the applicant as close as possible to the DH being used for flight test purposes. An applicant must complete the approach to a landing or stabilized hover without excessive maneuvering and within the runway TDZ. The approach angle must not be erratic, excessively steep, or shallow in the visual segment.

C. Crosswind Landing. Crosswind landings will normally be performed from a VFR traffic pattern, but may be combined from a nonprecision approach.

D. Maneuver and Landing with a Powerplant Inoperative—Multiengine Helicopters. Inspectors and examiners should introduce this event in a realistic manner. Consideration should be given to the helicopter weight, atmospheric conditions, and helicopter position. The helicopter position at the onset of the engine failure should allow enough room for the applicant to maneuver the helicopter and to exercise judgment.

E. Autorotation (Single-Engine Only). An autorotation is required for single-engine helicopters. Inspectors are cautioned to ensure that the landing area is appropriate for such operations. All autorotation approaches to off airport sites will be terminated in power recoveries.

5-913 MISSED APPROACH EVENTS. Missed approaches from two separate instrument approaches are required to complete the flight test. At least one missed approach shall be flown through the entire missed approach procedure, unless traffic or ATC restrictions prevent completing the entire procedure. One missed approach is required from an ILS. When the flight test is conducted in a multiengine helicopter, one missed approach is required with the most critical powerplant inoperative. The engine-out and ILS missed approaches may be combined; however, to complete the flight test a minimum of two missed approaches are still required.

A. Missed Approach with a Critical Powerplant Inoperative. Inspectors and examiners must exercise good judgment concerning the performance characteristics of the helicopter involved when performing a missed approach with the critical powerplant inoperative. When helicopter performance is critical, inspectors and examiners should use their authority to

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modify the event. For example, a go-around may be combined with a simulated powerplant failure at a safe altitude.

B. Initiating a Missed Approach. The applicant must promptly execute the missed approach procedure if the runway environment is not acquired at DH on an ILS approach. If the runway environment is not in sight on a nonprecision approach, or if the aircraft is not in a position to land at the missed approach point, the applicant must initiate a missed approach. If conditions on any type of approach prevent continuation of the approach, the applicant must initiate a missed approach. For example, a missed approach above DH might be required when an instrument failure flag appears. A missed approach is required if the helicopter is below DH or MDA and cannot be properly aligned with the runway, or if the applicant loses sight of the runway environment. The applicant must adhere to the published missed approach or the instructions given by ATC and observe the procedures and limitations in the operator's aircraft operating manual. An applicant must properly use the available aids and other crewmembers when making the transition back to the instrument navigation environment.

5-914 NORMAL AND ABNORMAL PROCEDURE EVENTS. The inspector or examiner shall require the applicant to demonstrate the proper use of as many of the helicopter's systems and devices as necessary to determine if the applicant has a practical knowledge of the use of such systems. Evaluation of normal and abnormal procedures can usually be accomplished in conjunction with other required events and does not normally require a specific event to test the applicant's use of these systems and devices. The applicant's performance must be evaluated on the maintenance of helicopter control, the ability to recognize and analyze abnormal indications, and the ability to apply corrective procedures in a timely manner. Systems to be evaluated include, but are not limited to, the following:

- Anti-icing and deicing systems;
- Autopilot and stability augmentation systems;
- Navigation and airborne radar systems; and
- Any other available systems, devices, or aids available (such as flight management systems (FMS)).

5-915 EMERGENCY PROCEDURE EVENTS. The applicant must be able to competently operate all installed emergency equipment and to correctly apply the procedures specified in the operator's aircraft operating manual.

A. Powerplant Failures. Inspectors and examiners may introduce malfunctions requiring an engine shutdown during the flight test. This provision is not intended as authority to require an unrealistic number of failures, but to permit such failures at times when they are most appropriate. Powerplant failures should be limited to those necessary for determining an applicant's proficiency. If a multiengine helicopter is not capable of maintaining altitude with an engine inoperative, applicants are expected to maintain the best engine-out climb speed while descending. The applicant must promptly identify the inoperative engine and initiate correct action while maneuvering the helicopter safely. Smooth application of flight controls and proper trim is required.

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B. Other Emergency Procedures. Inspectors and examiners should sample as many of the following events as necessary for determining whether an applicant is proficient in identifying and responding to emergency situations:

- Fire in flight;
- Smoke control;
- Hydraulic and electrical system failure or malfunctions (if safe and appropriate);
- Navigation or communications equipment failure; and
- Any other emergency procedures outlined in the operator's aircraft operating manual or training program.

5-916 STANDARDS OF ACCEPTABLE PERFORMANCE. The highest grade of pilot certificate issued is the airline transport pilot (ATP) certificate. An applicant for this certificate must possess the highest degree of piloting skills and be the master of the helicopter, the crew, and the situation throughout the aircraft's operational envelope. In addition to the guidance on standards of performance for the oral test phase discussed in Volume 5, Chapter 1, Section 3, the following guidance applies to the ATP certificate.

A. Manipulative Skills. The manipulative skill standards for the ATP certificate are the most rigorous of all pilot certificates issued. The skills requirement for the ATP certificate and for other certificates differs not in the tolerances allowed but in the degree of mastery required. The applicant for an ATP certificate must demonstrate the ability to operate the aircraft smoothly under a complex set of circumstances. The applicant's performance must be such that the inspector or examiner is never seriously in doubt of the successful outcome of each event of the flight test. The determination of whether an applicant's performance is acceptable or not is derived from the experience and judgment of the inspector or examiner. It is imperative that inspectors and examiners be fair and consistent when making their determinations. For example, weather, helicopter responsiveness, traffic, and other factors beyond an applicant's control may cause the applicant to deviate briefly during the accomplishment of a maneuver. In the case of turbulence, the applicant is expected to adhere to the procedures for adjusting the target speed as specified in the operator's helicopter operating manual. In such a situation, an applicant who makes a determined effort, who is generally successful in maintaining close control, and who does not deviate to the extent safety is compromised, should be considered to have met the standard.

B. Flight Management Skills. The term "pilot in command" (PIC) implies that the pilot is the leader of a crew and bears the final responsibility for the safe conduct of the flight. This standard, more than any other, distinguishes the successful applicant for an ATP certificate from those holding other grades of certificates. The ATP flight test must not be limited to a simple demonstration of a series of events. An ATP applicant must demonstrate a mastery of complex problems, good judgment, situational awareness, cockpit management, and leadership skills.

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Figure 5-120. ATP/Type Rating Oral Test Job Aid—Helicopter

I. APPLICATION PHASE. The applicant must present:

[ ] FAA Form 8410-2 (application) completed and signed
[ ] Current medical certificate:

1. For original ATP: First class
2. For additional class or type rating: Third class

[ ] Pilot Certificate:

1. For original ATP: Commercial or equivalent
2. For additional class or type rating: ATP

[ ] Current or validated AC Form 8080-2, "Airman Written Test Report," for ATP or additional class rating. If validity date of oral extended, add the following comment to AC Form 8080-2: "The period of validity of this form has been extended in accordance with the applicable provisions of FAR § 61.39(b)," and date, and sign.
[ ] FAA Form 8060-5, "Notice of Disapproval of Application" (if applicable)
[ ] Training records showing applicant has successfully completed all ground training events including integration training

II. THE ORAL TEST

[ ] A. Knowledge of Aircraft Systems

[ ] Hydraulic
[ ] Pneumatic
[ ] Flight instruments
[ ] Landing gear, wheel
[ ] FMS, EFIS
[ ] Fuel
[ ] Electrical
[ ] Powerplants
[ ] Flight controls
[ ] Autopilot, F/D
[ ] Navigation systems
[ ] Rotor system

[ ] B. Knowledge of and ability to compute performance data, takeoff, landing, and cruise performance
[ ] C. Weight and balance
[ ] D. Ability to perform or state "Immediate Action" items
[ ] E. Knowledge of and ability to state operating limitations
[ ] F. Knowledge of related items (such as MEL)

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Figure 5-121. ATP/Type Rating Flight Test Job Aid—Helicopter

GROUND OPERATIONS		
Preflight Inspection	[ ]	
Taxiing and Ground Hover	[ ]	
Powerplant Checks, Rotor Engagement	[ ]	
TAKEOFFS		
Normal	[ ]	
Instrument	[ ]	
Crosswind	[ ]	
With Powerplant Failure	[ ]	
Rejected Takeoff	[ ]	
INSTRUMENT PROCEDURES		
Area Departure	[ ]	
Area Arrival	[ ]	
Holding	[ ]	
Normal ILS Approach	[ ]	With F/D
Autopilot-Coupled ILS	[ ]	If equipped
Engine-Out ILS	[ ]	
Nonprecision Approach	[ ]	
Second Nonprecision Approach	[ ]	
Circling Approach	[ ]	
Missed Approach from an ILS	[ ]	
Engine-Out Missed Approach	[ ]	
IN-FLIGHT MANEUVERS		
Steep Turns	[ ]	
Settling with Power	[ ]	
Specific Flight Characteristics	[ ]	
Powerplant Failure	[ ]	
LANDINGS		
Normal Landing	[ ]	
Landing from an ILS	[ ]	
Crosswind Landing	[ ]	
Autorotation (Single-Engine)	[ ]	
From Circling Approach	[ ]	

NORMAL, ABNORMAL, AND EMERGENCY PROCEDURES—SAMPLE

[ ] Anti-Icing and Deicing; Hydraulic, Electrical, Pneumatic, and Other System Failures; Gear, Flaps, Control Systems; Navigation and Communications Equipment; Fire in Flight, Smoke Control; Decompression, Emergency Descent, Emergency Landing, and Evacuation

NOTE: Inspectors should refer to the appropriate section of "Airline Transport Pilot and Type Rating Practical Test Standards" (FAA-S-8081-5), as amended, for maneuver tolerances.

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BRIEFINGS

[ ] A. Brief Applicant:
1. Departure point, destination, route, weather
2. Aircraft weight and fuel load
3. Role of inspector
4. Use of crewmembers and autopilot (Applicant is in command and must perform command duties successfully.)
5. Review minimums to be used on test

[ ] B. Brief Supporting Crewmembers:
1. Crew will perform normal duties of their positions
2. Will act in support role and not initiate. May be asked to delete calls, altitude alerts, etc.
3. Duties of safety pilot

[ ] C. Safety Pilot Briefing:
1. Use of hood
2. Transfer of controls
3. Simulated emergencies
4. Response to an actual emergency
5. Autorotations
6. Other specific events

RESERVED. Paragraphs 5-917 through 5-935.

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VOLUME 6 SURVEILLANCE

CHAPTER 2 PART 121, 135, AND 91 SUBPART K INSPECTIONS

Section 4 Ramp Inspections for Part 91 Subpart K Operators and Part 121 and 135 Air Carriers

6-231 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.

A. Maintenance: 3627.

B. Avionics: 5627.

C. Operations: 1622.

6-232 OBJECTIVE. This section provides guidance for sampling the quality of maintenance and the degree of compliance with the operator/fractional program manager's (hereafter referred to as the program manager) maintenance procedures on in-service aircraft operated under Title 14 of the Code of Federal Regulations (14 CFR) part 91 (subpart K), and part 121, 125, 129 (§ 129.14), 133, 135, 137, 141, or 142.

6-233 GENERAL.

A. Inspector Training. It is important that aviation safety inspectors (ASI) become familiar with the type of aircraft to be inspected before performing the inspection. This can be accomplished by on-the-job training.

NOTE: Only ASIs who have received part 129 geographic inspector training or are permanently assigned to an International Field Office (IFO) may conduct foreign air carrier inspections.

B. Personnel Needed for Inspection.

1) Due to the hub and spoke concept, many aircraft have less than one hour ground time. To ensure that the inspection is performed adequately, the Federal Aviation Administration (FAA) recommends that two inspectors perform this task in exterior and interior phases.

NOTE: ASIs do not have to give part 129 operators advance notice that a ramp inspection will be conducted. However, inspection activities must be timed so they do not delay or interfere with passenger boarding or deplaning or impede aircraft service or catering. The captain, his or her representative, or an appropriate airline representative should also be present.

2) Due to the nature of fractional ownership operations, part 91 subpart K aircraft may have little or no ground time at any one location. As with on demand air carriers, these aircraft may be dispatched at short notice. It is important to coordinate with flightcrews, maintenance crews, and, where possible, dispatch personnel. To ensure that the inspection is

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performed adequately, the FAA recommends that two inspectors perform this task in exterior and interior phases.

NOTE: En route inspections are not allowed in these aircraft when they are operated under part 91 subpart K.

C. Coordination.

1) Airworthiness and Operations ASIs possess various degrees and types of expertise and experience. An ASI who needs additional information or guidance on a given subject should coordinate with personnel experienced in that particular specialty.

2) Geographic units may need to coordinate with the certificate-holding district office (CHDO) for domestic operations and the IFO for part 129 operations, as they do not always have access to the program manager's or air carrier maintenance procedures manual. In addition, when discrepancies are found, the geographic unit should communicate with the CHDO or the IFO.

D. Use of FAA ASI Credentials to Access Aircraft and Secure Areas of U.S. Airports. Proper use of identification credentials, checkpoint procedures, and resolution of misunderstandings with airlines and other government agencies are crucial for the creation of an environment where ASIs can conduct effective inspections and surveillance. Both the FAA Flight Standards Service and the Transportation Security Administration (TSA) have reaffirmed the necessity of ASI access to Security Identification Display Areas (SIDA) and Airport Operations Areas (AOA). However, because of TSA's enhanced screening process and other airport security measures, ASIs must undergo extra steps when entering a SIDA. FAA Order 8000.38, Aviation Safety Inspector Credential Program, as amended, provides guidance and policy for the use of FAA Form 110A, Aviation Safety Inspector's Credential. ASIs should reference this order for specific guidance and policy on access to aircraft and secure areas of U.S. airports.

6-234 OBJECTIVES OF RAMP INSPECTIONS. The primary objective of a ramp inspection is to provide inspectors with the opportunity to evaluate an air carrier operation while the crewmembers and aircraft are on the ground. A ramp inspection is an effective method for evaluating an operator's ability to prepare both the aircraft and crew for a flight to be conducted. Also, when a ramp inspection is conducted after the completion of a flight, it is an effective method for determining whether the aircraft and crew were adequately prepared for the flight, as well as for evaluating the operator's postflight and/or turnaround procedures and crewmember and ground personnel compliance with these procedures. Ramp inspections allow inspectors to observe and evaluate the routine methods and procedures used by an operator's personnel during the period immediately before or after a flight, to determine compliance with regulations and safe operating practices.

6-235 INITIATION AND PLANNING.

A. This task is scheduled as part of the work program or special emphasis request. Additional inspections are initiated by national, regional, or district office special requirements.

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B. The ramp inspection provides the ASI with an opportunity to ensure that the compliance dates and requirements of new Airworthiness Directives (AD) and regulatory revisions have been met. ADs, Service Difficulty Report Summaries, Maintenance/Airworthiness Bulletins, and PTRS entries should be reviewed, when available. (This is also applicable to U.S.-registered aircraft operated by foreign operators under § 129.14.)

6-236 MAINTENANCE RECORDS.

A. Regulations require maintenance to be recorded whenever it is performed prior to an approval for return to service. The operator/program manager's maintenance procedures manual should describe the procedures for ensuring that these recording requirements are met, including the specific instructions on when an airworthiness release or appropriate maintenance log entry is required.

B. Operators/air carriers/program managers must either correct or defer all mechanical discrepancies entered in the maintenance log using the methods identified in their maintenance procedures manual. Some Program managers may include these procedures in a separate maintenance procedures manual. Additionally, some fractional ownership program aircraft are also operated by part 121 or 135 operators. In such cases, maintenance procedures may be contained within the carriers' maintenance manual. As a variety of manuals are used, the FAA advises reviewing the appropriate manuals before performing the inspection.

C. Fractional ownership programs can select either an inspection program or a continuous maintenance program. Refer to the program manager's operating manual for the details of the program that they have selected. The inspection/maintenance program information will often be carried onboard the aircraft.

D. The Minimum Equipment List (MEL) has certain procedures and conditions that operators/air carriers/program managers must meet prior to deferring the item(s).

1) These procedures are identified by "O," "M," and "O/M" and are normally contained in the operator/program manager's FAA-approved MEL. Sometimes the MEL references these procedures to another document.

2) When reviewing the records for MEL compliance, the ASI must determine what procedures are required for deferral and ensure that these procedures are accomplished.

3) The ASI must ensure that all applicable repetitive MEL procedures are accomplished for those items that are deferred and are continuing to be deferred through the station. These repetitive maintenance procedures must be signed off in the maintenance log as evidence that the procedures were accomplished.

6-237 DEFERRED MAINTENANCE.

A. Minimum Equipment List—Deferred Maintenance. The operator/program manager's FAA-approved MEL allows the operator to continue a flight or series of flights with certain inoperative equipment. The continued operation must meet the requirements of the MEL deferral classification and the requirements for the equipment loss.

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B. Other Deferred Maintenance.

1) Operators/program managers frequently use a system to monitor items that have been inspected and found within serviceable limits. These items are still airworthy, yet warrant repair at a later time or when items no longer meet serviceable limits. This method of deferral may require repetitive inspections to ensure continuing airworthiness of the items. Examples of items that are commonly deferred in this manner are fuel leak classifications, dent limitations, and temporary (airworthy) repairs. Not all fractional ownership programs have this capability. Refer to the program manager's manual for this information.

2) Passenger convenience item (not safety/airworthiness related) deferrals should be handled in accordance with (IAW) the operator/program manager's program.

C. Prompt Repairs. The maintenance program approved for an operator must provide for prompt and orderly repairs of inoperative items. Not all program managers have approved maintenance programs, but the ASI should confirm that inoperative items are repaired promptly.

6-238 CABIN INSPECTION.

A. This inspection should be conducted immediately, when possible, without disturbing the loading and unloading of passengers. The inspection can be performed when some passengers are onboard during through-flights, but ASIs must exercise good judgment by inspecting areas away from the passengers.

B. Bring any discrepancy to the attention of the flightcrew or appropriate maintenance personnel immediately.

6-239 CARGO/PAX COMBINATION CONFIGURED AIRCRAFT.

A. Structural Damage. Inspection results have disclosed instances of significant aircraft structural damage resulting from careless loading of cargo, such as:

- Torn or punctured liners, indicating hidden damage to circumferential stringers, fuselage skin, and bulkheads;
- Damaged rollers, ball mats, etc., causing significant structural damage to the floors; and
- Corrosion and structural damage caused by improper handling of some hazardous materials.
- Observation of hazardous material handling is normally not a surveillance function of the ASI during a ramp inspection. However, if discrepancies are noted during the ramp inspection, the ASI should contact the appropriate TSA office. Additional guidance for cargo configured aircraft is in Volume 6, Chapter 2, Section 5, Conduct Ramp Inspection on Cargo Loading.

B. Cargo Containers, Pallets, and Netting. As part of their normal surveillance, principal inspectors (PI) should ensure that adequate procedures are in place in the operator's manual to ensure that cargo restraint equipment conform to proper standards and are in condition to perform their intended function.

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1) If maintenance is required on any of the type certificate (TC) or Supplemental Type Certificate (STC) cargo containers or restraint devices, it must be accomplished IAW appropriate regulations.

2) Geographic inspectors performing air carrier surveillance should follow handbook guidance and report discrepancies in cargo handling/restraint devices through PTRS for follow-up action by the PI.

6-240 RAMP INSPECTION AREAS. There are five general inspection areas that can be observed and evaluated during ramp inspections. These inspection areas are as follows:

- Crewmember,
- Line station operations,
- Aircraft,
- Servicing and maintenance, and
- Ramp and gate condition and activity.

A. The "crewmember" inspection area refers to the evaluation of crewmember preparation for flight and compliance with postflight procedures. This area includes evaluations of crewmember manuals and any required flight equipment, flightcrew flight planning, flightcrew airman and medical certificates, crewmember disposition of trip paperwork, and other items that relate to crewmember responsibilities.

B. The "line station operations" inspection area refers to the various methods and procedures used by the operator to support the flight, such as distribution of dispatch, flight release, and flight-locating paperwork; distribution of weather reports, PIREPs and other flight planning material; passenger handling; boarding procedures; an carry-on baggage screening.

C. The "aircraft" inspection area refers to the aircraft's general airworthiness, logbook entries, MEL compliance, carryovers, and required items of emergency and cabin safety equipment.

D. The "servicing and maintenance" inspection area applies to any ongoing maintenance and servicing, such as fueling, deicing, or catering. This area is usually evaluated in detail by airworthiness inspectors when performing their ramp inspections. Operations inspectors should, however, observe this area and comment on obvious deficiencies for airworthiness inspector follow-up.

E. The "ramp and gate condition and activity" inspection area refers to taxi and marshalling operations, ramp or parking area surfaces, any apparent contamination or debris, vehicle operations, and the condition and use of support equipment.

6-241 GENERAL RAMP INSPECTION PRACTICES AND PROCEDURES.

A. Ramp inspections may be conducted before a particular flight, at en route stops, or at the termination of a flight. A ramp inspection may be conducted any time an aircraft is at a gate or a fixed ramp location, provided the inspection is conducted when the crew and ground

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personnel are performing the necessary preparations for a flight or when they are performing postflight tasks and procedures.

B. The operator does not have to be given advance notice that a ramp inspection is going to be conducted. Inspectors must, however, conduct inspections in a manner that does not unnecessarily delay crewmembers and/or ground personnel in the performance of their duties. The following areas of conduct should be observed by inspectors during ramp inspection activities:

1) Inspectors should not interrupt crew or ground personnel when they are performing a particular phase of their duties.

2) When inspection activities require inspectors to interact directly with the crew or ground personnel, the activities should be timed to be accomplished when the crew or ground personnel are waiting to begin another phase of their duties or after they have completed one phase of their duties and before they begin another phase.

3) Inspection activities must be timed so that they do not delay or interfere with passenger enplaning or deplaning.

4) Inspection activities should not adversely impede aircraft servicing or catering.

C. Because of the wide range of inspection areas involved, ramp inspections are usually limited in scope. There are many preparatory or postflight actions that occur simultaneously and one inspector cannot physically observe all of these actions for a particular flight. As a result, the inspector should vary the areas of emphasis for an inspection. For example, on one ramp inspection the inspector may decide to observe and evaluate the PIC accomplishing flight planning and the operator's methods for providing the flightcrew with appropriate flight planning support. On another ramp inspection, the inspector may decide to observe the SIC accomplish the aircraft exterior preflight and then evaluate the aircraft's interior equipment and furnishings. As an example of a ramp inspection conducted at the termination of a flight, the inspector may decide to inspect the aircraft's interior equipment, furnishings, and aircraft logbooks, and then evaluate the trip paperwork turned in by the crew. In this example, the inspector may not have an opportunity to interact directly with the crew; therefore, the "crewmember" inspection area would not be accomplished. Inspectors should vary both the sequence and the emphasis of the inspection areas during a ramp inspection. Inspectors should describe in their reports how the inspection was limited in scope.

D. Inspectors should use the Air Carrier Ramp Inspection Job Aid (Figure 6-17) when conducting ramp inspections. This job aid contains a listing of items ("reminders") that should be observed and evaluated by the inspector during the inspection. The job aid also includes applicable PTRS comment codes to facilitate the writing of the inspection report. There may be items evaluated during a ramp inspection that are not listed on the job aid. In such cases, the PTRS comment code entitled "other" should be used for the appropriate inspection area. The job aid can be used to help describe how the inspection was limited in scope. The job aid can also be used to make notes during the inspection which can be transcribed later to the PTRS Data Sheet.

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6-242 SPECIFIC RAMP INSPECTION PRACTICES AND PROCEDURES.

A. Crewmember Inspection Area. When an inspector makes direct contact with a crewmember, the inspector should provide an official but courteous introduction, offer appropriate identification for the crewmember to inspect, and inform the crewmember that a ramp inspection is being conducted. If the direct contact is with a flight crewmember, the inspector should request to see the crewmember's airman and medical certificates. The inspector should review the certificates to see that they meet the appropriate requirements for both the duty position and for the aircraft for the flight to be conducted or that was just terminated. When the direct contact is with flight crewmembers or flight attendants, the inspector should also request to examine the crewmember's professional equipment. Crewmember professional equipment includes any equipment that crewmembers are required to have according to regulation or operator policies, either on their person or that which will be available during the flight. Examples of professional equipment include aeronautical charts, appropriate operator manuals, and operable flashlights. Inspectors should determine whether the charts and manuals carried by crewmembers are current. The following is a list of other items and activities that, depending on the scope of the ramp inspection, should be observed and evaluated:

- Flightcrew flight-planning activities, such as review of weather, flight plans, anticipated takeoff weight and performance data, flight control requirements (dispatch, flight release, flight-locating, ATC flight plans);
- Flightcrew aircraft preflight activities, such as exterior walkaround, logbook reviews, and cockpit setup procedures, including stowage of flightcrew baggage and professional equipment;
- Flight attendant inspection of cabin emergency equipment and cabin setup procedures, including stowage of flight attendant baggage and professional equipment;
- Flightcrew and flight attendant postflight logbook entries and proper use of MELs and placards; and
- Completed trip paperwork and the appropriate disposition of such paperwork.

B. Line Station Operations Area. This area of a ramp inspection usually involves a facility (or designated area of a facility) including related ground personnel, and is commonly referred to as "line station operations." Line station operations include a designated location where crewmembers go to review and pick up required flight paperwork or to deposit flight reports, to send or receive communications with the operator's flight control system, and to join up with other crewmembers assigned to the flight. Line station operations also include gates and ramp areas where passengers and cargo are enplaned and deplaned. The following is a list of items and activities that, depending on the scope of the inspection, should be observed and evaluated in this inspection area:

- Preflight and postflight trip paperwork, such as load manifests, flight plans, weather reports and forecasts, NOTAMs, dispatch or flight release messages and operator bulletins;
- Methods used by the operator to comply with MEL and CDL requirements, particularly the preflight information provided to the crew;

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- Adequacy of facility with respect to crewmember and ground personnel use for completing preflight and postflight responsibilities, including work areas and administrative support (such as forms, charts, and copy machines when required by company procedures);
- Usability and currency of operator manuals and aircraft performance information maintained at the line station operations area for crew and ground personnel use
- Company communication capabilities and procedures;
- Passenger enplaning and deplaning including public protection procedures and carry-on baggage screening; and
- Cargo and baggage loading and stowage procedures and unloading procedures.

C. Aircraft Inspection Area. Ramp inspections must include at least an examination of the aircraft's registration, airworthiness certificate, and maintenance logbook. Inspectors should plan their ramp inspection activities so that any inspection of the aircraft's interior equipment and furnishings would be conducted either before passengers are enplaned or after they are deplaned. The following is a list of items that should be observed in this inspection area:

- Aircraft registration and airworthiness certificates;
- Aircraft and cabin logbooks (or equivalent) (open discrepancies, carryover items, and cabin equipment items needing repair or replacement);
- Appropriate placarding;
- Fire extinguishers (correct types, numbers and locations; properly serviced, safetied, tagged, and stowed);
- Portable oxygen bottles (correct numbers and locations; properly serviced, tagged, and stowed; condition of mask, tubing, and connectors);
- Protective breathing equipment (properly located, stowed, and sealed);
- First aid kits and emergency medical kits (correct numbers and locations; properly sealed, tagged, and stowed);
- Megaphones (correct numbers and locations; in operable condition, and properly stowed);
- Crash ax (properly located and stowed);
- Passenger briefing cards (one at each seat position; appropriate to aircraft; required information including emergency exit operation, slides, oxygen use, seatbelt use, brace positions, flotation devices; appropriate pictorials for extended overwater operations, including ditching exits, life preserver, and life or slide raft inflight location);
- Passenger seats (not blocking emergency exits; TSO label on flotation cushions; cushion intact; latching mechanism on tray tables; armrests have self-contained and removable ashtrays; seatbelts properly installed, operational, and not frayed or twisted);
- Passenger oxygen service units (closed and latched with no extended red service indicators or pins);
- Flight attendant stations (operable seat retraction and restraint systems; properly secured; harnesses not frayed or twisted; seat cushions intact; headrests in correct position; PA system and interphone);

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- Galleys (latching mechanisms - primary and secondary; tiedowns; condition of restraints; padding; proper fit of cover and lining of trash receptacles; hot liquid restraint systems; accessibility and identification of circuit breakers and water shut-off valves; non-skid floor; girt bar corroded or blocked by debris; clean stationary cart tiedowns (mushrooms); galley carts in good condition and properly stowed; lower lobe galley emergency cabin floor exits passable and not blocked by carpeting, if applicable);
- Galley personnel lift, if applicable (no movement up or down with doors open; safety interlock system; proper operation of activation switches);
- Lavatories (smoke alarms; no-smoking placards; ashtrays; proper fit of cover and lining of trash receptacles; automatic fire extinguisher systems);
- Stowage compartments (weight restriction placards; restraints and latching mechanisms; compliance with stowage requirements; accessibility to emergency equipment; carry-on baggage provisions);
- Required placards and signs (seatbelt, flotation equipment placards at seats; emergency/safety equipment placards; weight restriction placards; no-smoking/seatbelt signs; no-smoking placards; exit signs and placards, including door opening instructions);
- Emergency lighting system (operation independent of main system; floor proximity escape path system; controllability from cockpit);
- Exits (general condition; door seals; girt bars and brackets; handle mechanisms; signs; placards; slide or slide raft connections and pressure indications; lights and switches); and
- Main landing gear viewing ports, if applicable (cleanliness and usability).

D. Servicing and Maintenance Inspection Area. The servicing and maintenance of the aircraft may be observed at any time during the ramp inspection. The following is a list of some areas that may be observed and evaluated in this inspection area:

- Fueling procedures (ground wires in place; fuel slip properly completed; fueler trained in the operator's specific procedures);
- Routine maintenance (qualifications of mechanics, repairmen or service agents; appropriate logbook entries);
- Deicing procedures (compliance with company procedures; proper glycol/water ratios and temperatures; avoidance of engine/APU inlets; removal of all snow and ice; trailing and leading edges free of snow and ice and covered completely with deicing fluid);
- Correct procedures used by service contractors (caterers; cleaners; lavatory and water servicing personnel; correct use of switches and controls); and
- Vehicle operation near aircraft (general condition and proper servicing of vehicles and equipment).

E. Ramp and Gate Condition and Activity Inspection Area. During ramp inspections, inspectors should observe and evaluate the ramp and gate surface condition as well as any support activities being conducted during an inspection. Inspectors should observe vehicular operations on the ramp and around gate areas and other aircraft operations during marshalling,

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taxiing, or towing operations. Inspectors should report any condition that appears to be unsafe or could potentially be unsafe. The following is a list of some items that should be observed and evaluated in this inspection area:

- Ramp, apron, and taxiway surfaces (general condition; cracks; holes; uneven surfaces);
- Contamination debris (FOD; fuel, oil, or hydraulic spills; snow and ice accumulations; taxi lines; gate markings; signs; signals);
- Construction (appropriate barriers; signs; markings; flags); and
- Vehicular operations (conducted safely around aircraft and gate areas by qualified personnel).

6-243 PERFORMING THE RAMP INSPECTION.

A. This inspection must be accomplished without interfering with the turnaround of the aircraft. The following list includes some of the activities that could delay the turnaround time if interfered with:

- Boarding and deplaning of passengers,
- Servicing,
- Fueling,
- Maintenance,
- Baggage handling, and
- Any other operator/program manager activity.

B. The ASI must immediately bring any discrepancies noted to the attention of appropriate personnel, to allow the operator/program manager the opportunity to take corrective action without interrupting the flight schedule. The ASI must verify that all corrective actions taken were IAW the requirements of the operator/program manager's maintenance procedures manual.

6-244 RAMP INSPECTION JOB AID. Figure 6-17 is the Air Carrier Ramp Inspection Job Aid, which is available on the district office Job Aid Disk.

6-245 PREREQUISITES AND COORDINATION REQUIREMENTS.

A. Prerequisites:

- Experience working with similar type aircraft; and
- Knowledge of the program manager's operating manual, if applicable.

B. Coordination:

1) This task may require coordination between Maintenance, Avionics, Cabin Safety, and Operations ASIs.

2) Geographic units should coordinate with the CHDO or the IFO.

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6-246 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Title 14 CFR Parts 21, 23, 25, 27, 29, 43, 45, 47, 91; and International Civil Aviation Organization (ICAO) Annexes 6 and 8.
- FAA Order 8340.1, Maintenance Bulletins.
- Operator's Maintenance Procedures Manual/program manager's maintenance/operations procedures manual.

B. Forms. FAA Form 110A, Aviation Safety Inspector's Credentials.

C. Job Aids:

- Figure 6-17, Air Carrier Ramp Inspection Job Aid.
- Figure 6-18, Interior Inspection Guidelines.
- Figure 6-19, Exterior Inspection Guidelines.
- JTAs: 2.2.4, 2.2.5, 2.3.58.

6-247 PROCEDURES.

A. Begin the Inspection. Begin the ramp inspection IAW the district office work program or other directives.

B. Prepare for the Inspection.

1) Coordinate with the operator/program manager's scheduling personnel or crew, select the flight to be inspected, and determine the type of equipment and ground time needed.

2) Determine recent problem areas that were identified for that type of aircraft, if any.

3) Determine if recent regulatory changes and AD requirements affect the aircraft to be inspected.

C. Conduct the Exterior Inspection, as Applicable. Perform this inspection IAW Figure 6-19.

D. Interview the Flightcrew. Introduce yourself and describe the purpose and scope of the inspection.

E. Inspect the Aircraft Maintenance Records.

1) Prior to departure of the aircraft, ensure that all open discrepancies from the previous flight are resolved IAW the operator/program manager's manual.

2) Review the maintenance records to determine if repetitive maintenance problems exist, which might indicate a trend.

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3) Ensure that all MEL items are deferred IAW the provisions of the operator/program manager's FAA-approved MEL.

a) Review the operator/program manager's FAA-approved MEL to determine if conditions, procedures, and placarding requirements were accomplished to defer specific items correctly.

b) Note the date when an item was first deferred to determine if the maximum allowed length of deferral was exceeded. Accomplish this by examining maintenance record pages, the deferred maintenance list, or deferred maintenance placards or stickers.

4) Ensure that an airworthiness release, maintenance record entry, or appropriate approval for return to service was made after the completion of maintenance.

5) Ensure that the maintenance record contains the following for each discrepancy:

- Description of the work performed or a reference to acceptable data;
- Date of completion of work;
- Name or other positive identification of the person approving the work;
- Name of the person performing work, if outside the organization;
- Signature, certificate number, and kind of certificate, if work has been performed satisfactorily; and
- If emergency maintenance is performed by personnel who are not covered by a drug and alcohol misuse program, ensure that the reporting requirements of part 91, § 91.1047(d) are complied with.

F. Conduct the Interior Inspection, as Applicable. Perform this inspection IAW Figure 6-18.

G. Debrief the Operator/Program Manager, Personnel, or Flightcrew. Inform the flightcrew or appropriate personnel that the inspection has been completed. Discuss the discrepancies brought to the operator/program manager's attention during the inspection.

H. Examine the Maintenance Record Entries. Ensure that the operator/program manager has recorded discrepancies noted during this inspection. If time is available, monitor the operator's corrective actions.

I. Analyze Findings. Analyze each finding to determine if the discrepancies are the result of improper maintenance and/or missing or inadequate maintenance/inspection procedures.

6-248 TASK OUTCOMES.

A. PTRS Completion.

1) The data reporting requirements for completing a part 129 aircraft ramp inspection using surveillance activity codes 3627 and 5627 have been revised. Section IV of the Data Sheet indicates each area that should be examined in the performance of 3627/5627 inspections. Comments are required only for those areas with findings or discrepancies noted

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during the inspection. For each discrepancy or finding, enter the appropriate primary area and key word on the Data Sheet. Next, enter either a potential (P) or unsatisfactory (U) for discrepancies and findings. In the PTRS comment field (section IV), enter the line item identification number shown on the Figure Sheet (1.1, 2.6, 3.4, etc.) and then enter a description of the discrepancy. If a positive comment is needed in a particular area for clarification, enter it using the appropriate primary area and key word shown on the PTRS form, using the information (I) opinion code. Only positive comments or comments provided for clarification purposes may use the I opinion code. All findings and discrepancies must use either the P or U opinion code.

2) All other ramp inspections should be entered into PTRS IAW the PTRS procedure manual (PPM).

B. Task Completion. Completion of this task can result in the following:

- Appropriate enforcement action when analysis of the findings disclose improper maintenance.
- Written notification to the operator/program manager of the necessary changes to the manual, when analysis of the findings discloses missing or inadequate maintenance/inspection procedures.
- Communication with the CHDO/IFO by the geographic unit finding discrepancies.

6-249 FUTURE ACTIVITIES. Based on inspection findings, determine if closer surveillance, additional enforcement, other job tasks, and/or additional coordination between the CHDO/IFO and geographic units are required to regain compliance.

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Figure 6-18. Interior Inspection Guidelines

A. Examine airworthiness and registration certificates. Ensure the following:

1) Airworthiness and registration certificates are current and valid.
2) Both certificates contain the same model, serial, and registration numbers.
3) Temporary registration is current.
4) Signatures are in permanent type ink.

B. Flight deck inspection. Inspect the following:

1) Instrument security and range markings.
2) Windows (delamination, scratches, crazing, and general visibility).
3) Emergency equipment.
4) Medical kit (if located on flight deck).
5) Seat belts and shoulder harnesses (Technical Standard Order marking, metal to metal latching, and general condition).
6) Check the following if using cockpit jump seat:
   a) Jump seat oxygen system. Turn regulator on and select 100% oxygen.
   b) Interphone system. Select Comm 1 and Comm 2 to ensure systems are working.
7) When the most forward jump seat is in the cabin, coordinate with the crew for connecting the headset and adapter cables.
8) Ensure that the jump seat is serviceable and that seat belt and shoulder harnesses are available.

C. Inspect cabin to include the following:

1) Lavatory. Ensure the following:
   a) Fire extinguisher system is installed in sealed trash containers,
   b) Smoke detection system is installed,
   c) Trash containers are sealed according to applicable Airworthiness Directive(s),
   d) No Smoking" placards are posted, and
   e) Ashtrays are available outside the lavatory.
2) Flight attendant seats.
   a) Pull the jump seat down to ensure seat retracts (those in path of exits).
   b) Inspect seat belts for Technical Standard Order marking, metal to metal latching and general condition.
3) Cabin emergency equipment. All equipment requiring periodic inspections should have an inspection date marked on it. Inspect the following:
   a) Flight attendant flashlight holder;
   b) Slide containers to ensure containers are properly marked for content. Check pressure of slide inflation bottle, if visible;
   c) Medical kit (if not checked on flight deck);
   d) First aid kit;
   e) Emergency oxygen (proper pressure and security);
   f) Megaphone(s) (security and general condition);
   g) Fire extinguishers (security, pressure, and seal);
   h) Life raft storage markings (if raft is required);
   i) Emergency briefing cards (random sample);
   j) General condition of emergency floor path lighting system;
   k) Placement of all "Emergency Exit" signs;
   l) Presence and legibility of "Emergency Exit" operation instructions;
   m) Placarding for location of all emergency equipment; and

4) Passenger seats. Ensure the following:

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Figure 6-18. Interior Inspection Guidelines

A. Examine airworthiness and registration certificates. Ensure the following:
1) Airworthiness and registration certificates are current and valid.
2) Both certificates contain the same model, serial, and registration numbers.
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4) Signatures are in permanent type ink.

B. Flight deck inspection. Inspect the following:
1) Instrument security and range markings.
2) Windows (delamination, scratches, crazing, and general visibility).
3) Emergency equipment.
4) Medical kit (if located on flight deck).
5) Seat belts and shoulder harnesses (Technical Standard Order marking, metal to metal latching, and general condition).
6) Check the following if using cockpit jump seat:
a) Jump seat oxygen system. Turn regulator on and select 100% oxygen.
b) Interphone system. Select Comm 1 and Comm 2 to ensure systems are working.
7) When the most forward jump seat is in the cabin, coordinate with the crew for connecting the headset and adapter cables.
8) Ensure that the jump seat is serviceable and that seat belt and shoulder harnesses are available.

C. Inspect cabin to include the following:
1) Lavatory. Ensure the following:
a) Fire extinguisher system is installed in sealed trash containers,
b) Smoke detection system is installed,
c) Trash containers are sealed according to applicable Airworthiness Directive(s),
d) No Smoking" placards are posted, and
e) Ashtrays are available outside the lavatory.
2) Flight attendant seats.
a) Pull the jump seat down to ensure seat retracts (those in path of exits).
b) Inspect seat belts for Technical Standard Order marking, metal to metal latching and general condition.
3) Cabin emergency equipment. All equipment requiring periodic inspections should have an inspection date marked on it. Inspect the following:
a) Flight attendant flashlight holder;
b) Slide containers to ensure containers are properly marked for content. Check pressure of slide inflation bottle, if visible;
c) Medical kit (if not checked on flight deck);
d) First aid kit;
e) Emergency oxygen (proper pressure and security);
f) Megaphone(s) (security and general condition);
g) Fire extinguishers (security, pressure, and seal);
h) Life raft storage markings (if raft is required);
i) Emergency briefing cards (random sample);
j) General condition of emergency floor path lighting system;
k) Placement of all "Emergency Exit" signs;
l) Presence and legibility of "Emergency Exit" operation instructions;
m) Placarding for location of all emergency equipment; and
n) Life preservers (vests).
4) Passenger seats. Ensure the following:

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a) Seats adjacent to emergency exits do not block exit path;
b) Seats are secure in seat track (random sample);
c) Seat breakover pressure is in accordance with operator's maintenance program (random sample);
d) “Fasten Seat Belt During Flight” placards are in view from all seats; and
e) Seat belts have metal-to-metal latches and are in good general condition (random sample).

5) Galleys/service centers. Inspect the following:
a) Trash bin lids for fit,
b) Storage compartment restraints,
c) Stationary cart tie-downs,
d) Lower lobe equipment/restraints,
e) Lift operation, and
f) Galley supply stowage.

6) Overhead baggage compartments. Check for weight restriction placards and the doors for proper latching, when applicable.

D. Inspect cargo compartment.

1) Ensure the following:
a) Cargo compartment fire protection is appropriate for its classification;
b) Cargo liner is free from tears and/or punctures. If these are noted, inspect structure behind liner for damage (stringers, circumferentials, etc.). Ensure sealing tape is proper type and in good condition;
c) Cargo door is free of fluid leaks and structural damage;
d) Fuselage door structure and sill is free of damage;
e) Smoke detectors are in satisfactory condition;
f) Lighting is operable and protective grills are installed;
g) Cargo flooring is free from structural or other damage; and
h) Pallet positions/compartments are placarded for position identification and weight limitations.

2) Inspect pallet system, if applicable. Ensure the following:
a) Ball mats are serviceable, e.g., no broken or missing balls;
b) Forward, aft, and side restraints are serviceable; and
c) Roller assemblies are secure and have no missing or broken rollers.

3) Ensure the 9G forward restraint net is serviceable, if applicable.

4) Ensure that cargo restraints for bulk loaded cargo are adequate, if applicable.

5) Inspect cabin mounted equipment.

6) Inspect fire extinguishers for inspection due dates and pressure.

7) Inspect load manifest for Hazardous Material. If present, determine crew knowledge of the following:
a) Location and labeling of hazardous materials;
b) Special requirements, if required; and
c) If proper paperwork is on board.

8) Ensure captain is aware of the following responsibilities:
a) Inspection of cargo to ensure proper load distribution;
b) Ensuring loads do not exceed compartment or position limits; and
c) Ensuring loads are being properly restrained.

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Figure 6-19. Exterior Inspection Guidelines

A. Accompany a flightcrew member during the exterior inspection, if possible, and inspect the following, as applicable:

1) Landing gear and wheel well areas. Check for the following:
   a) Any indication of wear, chafing lines, chafing wires, cracks, dents, or other damage;
   b) Structural integrity of gear and doors (cracks, dents, or other damage);
   c) Hydraulic leaks (gear struts, actuators, steering valves, etc.);
   d) Tire condition;
   e) Tire pressure (if pressure indicators are installed);
   f) Wheel installation and safety locking devices;
   g) Wear, line security, leaks, and installation of brakes; and
   h) Corrosion.
2) Fuselage and pylons. Inspect the following:
   a) Structure for cracks, corrosion, dents, or other damage;
   b) Fasteners (loose, improper, missing);
   c) Condition of radome;
   d) Condition of pitot tubes;
   e) Static ports (cleanliness and obstructions);
   f) Stall warning devices and other sensors;
   g) Antennas (security and indications of corrosion);
   h) Stains or other indications of leaks;
   i) Lavatory servicing areas (evidence of fresh blue water streaks);
   j) Cargo compartments for integrity of fire-protective liners (no holes or unapproved tape used for repairs);
   k) Emergency exit identification/markings;
   l) Registration marking (legibility); and
   m) All lights (general condition, broken lenses, etc.).
3) Wings and pylons. Inspect the following:
   a) Structure for cracks, corrosion, dents, or other damage;
   b) Leading edge (dents and/or damage in line with engine inlets);
   c) Leading edge devices (when open, actuator leaks, general condition of lines, wires, and plumbing);
   d) Evidence of fuel leaks (operator must prove leak is within established limits);
   e) All lights (general condition, broken lenses, etc.);
   f) Flaps (cracks, corrosion, dents, and delamination);
   g) Flap wells (general condition of lines, wires, and plumbing);
   h) Static eliminators (number missing);
   i) Ailerons and aileron tabs (cracks, corrosion, dents, delamination); and
   j) Missing, loose, or improperly secured access door/inspection panels and blowout panels.
4) Engines. Inspect the following:
   a) Intake for fan blade damage and oil leaks;
   b) Ring cowl for missing or loose fasteners;
   c) Cowling doors for security and proper fit;
   d) Lower cowling for evidence of fluid leaks;
   e) Exhaust for turbine and tailpipe damage and evidence of fluids;

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f) Reverser doors for stowage and security, and evidence of leaks; and
g) Access doors for security.

5) Propellers. Inspect the following:
a) Leading edge of propeller for cracks, dents, and other damage;
b) Deicer boots for signs of deterioration and security; and
c) Spinners for security, cracks, and evidence of fluid leaks.

6) Empennage. Inspect the following:
a) Leading edge for dents;
b) All lights (general condition, broken lenses, etc.);
c) Missing static discharge eliminators;
d) Elevator, rudder, and tabs (cracks, corrosion, dents, and delamination); and
e) Evidence of elevator and rudder power unit hydraulic leaks.

7) Ground safety. Inspect the following:
a) Positioning of support vehicles.
b) Fueling of aircraft to include the following:
1. Refueling pressure,
2. Condition of refueling unit (leaks, filter change dates, exhaust system, etc.),
3. Grounding,
4. Fire protection, and
5. General fueling procedures.
c) General condition of ramp to include the following:
1. Provisions for grounding,
2. Foreign objects on ramp,
3. Fuel spills,
4. General housekeeping/cleanliness,
5. Passenger control, and
6. Fire protection.

8) Baggage. Observe loading and unloading of baggage compartments to include the following:
a) Baggage restraining system, and
b) Load distribution.

RESERVED. Paragraphs 6-250 through 6-264.

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VOLUME 7 INVESTIGATIONS

CHAPTER 1 ACCIDENT AND INCIDENT INVESTIGATION AND REPORTING

Section 1 Accident Investigations

7-1 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES.

A. Operations (Operations, Cabin Safety, and Dispatch): 1702, 1703, 1761.

B. Maintenance: 3702, 3703, 3761.

C. Avionics: 5702, 5703, 5761.

7-2 COORDINATION REQUIREMENTS. This task requires coordination with unit supervisors, the Regional Operations Center (ROC), the appropriate Flight Service Station (FSS), and the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), as applicable. For an accident involving a Title 14 of the Code of Federal Regulations (14 CFR) part 121 air carrier certificate holder, contact a Post Accident Assistance Team (PAAT) for support. The manager of the affected regional Flight Standard division (RFSD) or the office manager of the affected field office may contact the Flight Standards National Field Office (AFS-900) division manager of the need for a PAAT. Paragraph 7-14 further describes the type of support provided by the PAAT.

NOTE: For the purposes of this section, the term Flight Standards District Office (FSDO) will be used to describe an FAA field office. Certificate management offices (CMO) and certificate-holding district offices (CHDO) are considered FAA field offices. Therefore, the acronym FSDO is meant to include CMOs and CHDOs.

7-3 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Office Procedures and Policy Manual.
- Federal Aviation Administration (FAA) Order 1270.1, Freedom of Information Act Program.
- FAA Order 2150.3, FAA Compliance and Enforcement Program.
- FAA Order 8020.11, Aircraft Accident and Incident Notification, Investigation, and Reporting.
- Volume 7, Chapter 7, Conduct Violation Investigation.

NOTE: The FAA expects aviation safety inspectors (ASI) to be familiar with Order 8020.11 and to have completed part one of Aircraft Accident Investigation training before acting as an FAA IIC during accident investigations.

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B. Forms. See FAA Order 8020.11, appendix 1, for a complete listing.

C. Job Aids. None.

7-4 GENERAL.

A. Definitions.

1) Aircraft Accident. An aircraft accident is an occurrence associated with the operation of an aircraft that:

- Takes place between the time the first person boards the aircraft with the intention of flight and the last person has disembarked;
- Results in death or serious injury; or
- Causes substantial damage to the aircraft.

NOTE: Refer to Title 49 of the Code of Federal Regulations (49 CFR) part 830, § 830.2.

2) Aircraft Incident. An aircraft incident is an occurrence, other than an accident, associated with the operation of an aircraft that affects or could affect the safety of operations.

3) Serious Injury. A serious injury is any injury that:

- Requires hospitalization for more than 48 hours, within 7 days from the date an injury was received;
- Results in a fracture of any bone (except simple fractures of fingers, toes, or nose);
- Causes severe hemorrhages and/or nerve, muscle, or tendon damage;
- Involves second- or third-degree burns, or burns affecting more than 5 percent of the body surface; and
- Involves damage to any internal organ.

4) Substantial Damage. Substantial damage is a damage or failure that adversely affects the structural strength, performance, or flight characteristics of the aircraft, and would normally require major repair or replacement of the affected component.

a) For the purpose of this task, exceptions to this definition include:

- Engine failure or damage limited to an engine;
- Bent fairings or cowling;
- Dented skin or small puncture holes in the skin or fabric;
- Ground damage to rotor or propeller blades; and
- Damage to landing gear, wheels, brakes, tires, flaps, engine accessories, or wing tips.

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b) ASIs are urged to fully consider all aspects of these exceptions before making a final "substantial damage" determination that would classify the occurrence as an accident.

B. Compliance and Enforcement. The FAA compliance and enforcement program promotes aviation safety and protects the public interest by seeking compliance with the regulatory requirements through the use of education, surveillance, and enforcement.

C. Fair and Equal Treatment. Agency actions, from investigation to disposition, must ensure fair and equal treatment for all involved individuals. This requires FAA employees to approach work objectively and pursue each step of the process without delay.

7-5 AUTHORITIES AND RESPONSIBILITIES.

A. Title 49 of the United States Code (49 U.S.C.). The NTSB and the FAA are both governed by 49 U.S.C. The NTSB is responsible for conducting investigations into each civil aircraft accident within the United States and is the agency assigned to execute the U.S. Government's responsibilities under the International Civil Aviation Organization (ICAO) Convention, Annex 13, Aircraft Accident and Incident Investigation. The products of an NTSB investigation are findings, conclusions, a statement of probable cause, and, as appropriate, recommendations.

B. FAA Responsibilities in the U.S. National Airspace System (NAS). The FAA has responsibilities for the safety of operations in the NAS and for safety of U.S. aircraft and operators outside the NAS. Title 49 U.S.C. § 1132(c) requires the NTSB to provide for the participation of the Secretary of Transportation in any aviation accident investigation conducted by the NTSB. This requirement is also illustrated in 49 CFR part 831, § 831.11(a)(4). The means whereby the NTSB fulfills the statutory and regulatory requirements for FAA participation in an accident investigation is by designating the FAA as a party to the NTSB investigation.

C. FAA Form 8020-23, FAA Accident/Incident Report. The product of an FAA accident or incident investigation is the FAA Form 8020-23 report. In that report, the FAA IIC makes a determination whether any of the of the FAA's nine responsibilities had any bearing on the event (see subparagraph 7-8A). In addition, the completed FAA Form 8020-23 contains the FAA IIC's identification of corrective actions planned or initiated. These actions include no action, counseling, the issuance of an FAA Safety Recommendation, re-examination of a certificate holder under 49 U.S.C. § 44709, or the issuance of a Service Difficulty Report (SDR) or Malfunction or Defect Report, or other action that the FAA IIC may identify. FAA Safety Recommendations issued as a result of an accident or incident investigation have initiated rulemaking actions, issuance of Airworthiness Directives (AD), and revision of policies, standards, and procedures.

D. Flight Standards Inspector Response to Accidents. While the NTSB officially investigates all civil aircraft accidents, and will issue an accident report for each aircraft accident under its jurisdiction, the NTSB often does not travel to the accident scene due to their limited investigator resources. In those cases, the FAA Flight Standards inspector responding to the accident represents the FAA and, as a party to the NTSB investigation, will share information with the NTSB IIC, as required by 49 CFR §§ 831.5 and 831.13.

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E. Other Parties. In addition to the involvement of the NTSB and the FAA, other parties may participate in the investigation of an accident. Company safety personnel, manufacturing representatives, union representatives, and others may be onsite to assist in the investigation. It is important that all personnel involved with the accident investigation be aware of the other parties and their teams in order to establish communication channels for obtaining and exchanging information.

F. Responsibility for Accident Investigation. This section incorporates information that was previously published in FAA N1100.327, Establishment of the Office of Accident Investigation and Prevention, which established The Office of Accident Investigation and Prevention (AVP). Among AVP's responsibilities are those for accident investigations, special accident/incident investigations and analyses, the analysis of accident/incident trends, managing NTSB and FAA Safety Recommendation Programs, and establishing FAA accident and incident investigation policy.

NOTE: AVP was formally known as the Office of Accident Investigation (AAI).

NOTE: The exception is near midair collision (NMAC). See Volume 7, Chapter 4.

7-6 ACCIDENT INVESTIGATION DIVISION (AVP-1). The Director, AVP-1, has the overall responsibility to develop FAA policy and procedural instructions for accident investigation and reporting. The primary element of AVP for accident and incident investigation policy is the Accident Investigation Division (AVP-100). AVP-100 does the following:

- Serves as focal point for the Administrator in coordination with the public, aviation industry, military, foreign governments, and representatives of accident investigation interests on those matters under the direct purview of the office;
- Apprises associate and assistant administrators, regions, centers, and other FAA organizations on safety issues and programs related to accident and incident investigation findings and analyses;
- Develops, coordinates, manages, evaluates, and executes FAA accident investigation program policies, procedures, practices, and quality assurance (QA) programs;
- Serves as the primary FAA organization for interaction with the NTSB dealing with accident and incident investigations;
- Identifies and provides the FAA IIC for major accident and incident investigations (see subparagraph 7-6A);
- Operates the FAA Accident Investigation Duty Room; and
- Operates the FAA Flight Data Laboratory.

A. Notification and Coordination Procedures. Headquarters (HQ) is notified through the command centers of an accident. AVP-100 determines whether AVP-100 or RFSD personnel will investigate the accident. If AVP-100 decides to send their own personnel, the regional FAA IIC will remain on the scene to provide support and assistance until relieved by the HQ FAA IIC.

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B. The "Go-Team." FAA involvement with the NTSB investigations of accidents or incidents of national or international attention will normally be handled by the Washington HQ, AVP-100. The FAA investigator coordinates with the NTSB and other divisions within the FAA. This investigator will accompany the NTSB "Go-Team." AVP-100 is responsible for designating the FAA IIC and will determine which accidents AVP-100 will investigate.

7-7 LEGAL BASIS FOR INVESTIGATIONS. Title 49 U.S.C. provides for FAA participation, as appropriate, in aircraft accident investigations conducted by the NTSB, and contains the two general responsibilities of the FAA pertinent to aircraft accidents and incidents. These responsibilities are as follows:

A. Recordation, Evaluation, and Prevention of Accidents. To ensure that all facts and circumstances leading to the accident are recorded and evaluated, and that action is taken to prevent similar accidents.

B. Enforcement of 14 CFR for Certification and Compliance. To promulgate and enforce 14 CFR for certifying civil aircraft airworthiness, for certifying airmen and air carrier certificate holders, for certifying airports used by certificate holders utilizing aircraft with more than 30 passenger seats, and for ensuring compliance with certain safety standards.

C. Special Circumstances. FAA personnel may encounter special circumstances during an accident or incident investigation. The FSDO and RFSD personnel should consult with AVP-100 if they encounter any circumstance in which there is a question concerning the FAA's authority to investigate. See the examples provided in subparagraphs 1) and 2):

1) For example, there is a requirement for the U.S. Military to provide for the participation of the Secretary of Transportation (delegated to the Administrator) in the investigation of an aircraft accident in which a duty of the Secretary may be involved. This could include the involvement of an air traffic facility operated by the FAA, or an accident involving an aircraft which is similar to an FAA type-certificated (TC) aircraft (i.e., a United States Air Force (USAF) C-37A, a derivative of the Gulfstream G-V).

2) Another example would be investigation of an accident involving a U.S.-registered aircraft holding an FAA airworthiness certificate operated by a military service of the United States (i.e., U.S. Army TH-67/Bell 206B helicopter).

7-8 FAA INVESTIGATIONS. Depending on the occurrence, accident investigation may involve local resources, one or more RFSDs, or participation from HQ divisions other than Flight Standards Service (AFS), including Security, Airway Facilities (AF), Air Traffic Organization (ATO), Aviation Medicine, Chief Counsel, Aircraft Certification Office (ACO), Public Affairs Offices, or International Aviation. The responsibility for coordinating the level of FAA involvement rests with the FAA IIC.

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A. Nine Responsibilities of the FAA. FAA Order 8020.11 lists nine specific responsibilities in all accident investigations conducted by the FAA. The FAA investigations must determine whether or not the following were a factor in the accident:

- The performance of FAA facilities or functions;
- The performance of non-FAA-owned and operated air traffic control (ATC) facilities or Navigational Aids (NAVAID);
- The airworthiness of FAA-certified aircraft;
- The competency of FAA-certified airmen, air agencies, commercial operators, or air carriers;
- The CFRs were adequate;
- The airport certification safety standards or operations were involved;
- The airport security standards or operations were involved;
- The airman medical qualifications were involved; and/or
- There was a violation of the 14 CFRs.

B. Parallel Investigation. The preferred method of conducting a concurrent and parallel investigation with the NTSB is for AFS to assign another inspector other than the FAA IIC to conduct the FAA investigation. If manpower resources do not permit another FAA inspector to conduct a separate investigation, then the FAA IIC will both assist the NTSB and represent the FAA.

NOTE: No enforcement action should be initiated by the FAA until the NTSB has completed the field investigation. Exceptions can be made in the interest of safety, such as an emergency revocation of a certificate. If any action is taken, it must be coordinated with the NTSB IIC and the RFSDs.

1) Because of the differences in the responsibilities of the NTSB (to determine probable cause) and the FAA (to enforce compliance with regulations), administrative law rules of evidence do not allow evidence obtained by the FAA under direction of the NTSB IIC to be used by the FAA against a defendant in legal enforcement proceedings.

2) It is important to note that, in conducting these investigations, there will be times when the FSDO needs additional information not required by the NTSB. For example, if, as the result of an investigation, it is determined that a regulation was violated by the flightcrew, the FAA IIC is required to gather sufficient evidence to prove the allegation in court, even though the evidence might not be required by the NTSB to determine the probable cause of the accident. In gathering that evidence, the FSDO will coordinate with the NTSB IIC in a manner that does not interfere with the investigation.

3) When FAA inspectors collect evidence for use against an airman, certificate holder, or commercial operator, there must be no question in the mind of the person from whom the evidence is being requested that the inspector is not working under the direction of the NTSB. For example, witness or crewmember statements should never be written on NTSB forms. The rules of evidence do not, however, prohibit FAA inspectors and NTSB investigators from gathering information simultaneously, such as when interviewing a witness, as long as the witness is aware that the information is being given to both the NTSB and to the FAA separately.

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7-9 PRINCIPAL INSPECTOR (PI) NOTIFICATION AND INVOLVEMENT. Principal operations inspectors (POI), principal maintenance inspectors (PMI), and principal avionics inspectors (PAI) assigned to a certificate holder or commercial operator involved in an accident must be available to the FAA IIC as soon as possible after notification of the accident. The FAA IIC is responsible for determining the extent of the PI involvement with the investigation. This decision will be made by the FAA IIC after consulting with the PI, the district office manager, and/or the appropriate Flight Standards division manager.

NOTE: The FAA IIC should avoid using a PI for investigations involving that inspector's assigned certificate holders or operators if possible.

7-10 ACCIDENT NOTIFICATION. Normally, a FSDO is made aware of aircraft accidents through the ROC; however, an FAA employee who becomes aware of an accident through other means will report the accident to the nearest air traffic facility (such as an air route traffic control center, an airport, a terminal facility, or an FSS). This facility will initiate FAA Form 8020-9, Aircraft Accident/Incident Preliminary Notice (refer to the FAA eForms Web site at https://eformservice.faa.gov) and will make the appropriate notifications, including one to the local ROC. The ROC will notify the FSDO having geographic jurisdiction over the area of the accident. Normally, the ROC will coordinate a conference telephone call between the NTSB, the FAA, and the air traffic facility initiating the notification. During this initial conversation, the FSDO inspector taking the information should do the following:

- Be prepared to copy initial information from the air traffic representative (the information to be given is on FAA Form 8020-9);
- Determine if the accident involves a certificate holder; and
- Request that the ATC statements and voice tapes be prepared and sent to the FSDO.

7-11 INSPECTOR FUNCTIONS. After being notified by the ROC of an accident, the FSDO in the geographic area of responsibility will designate an inspector as the FAA IIC. The inspector may be acting in different roles and performing different functions during the course of a certificate holder accident investigation. The inspector is usually at the scene of the accident prior to the arrival of either the NTSB or AVP-100 and should follow the guidelines in FAA Order 8020.11.

A. FAA IIC. Until relieved by the NTSB or an AVP-100 air safety investigator, the FSDO inspector will act as the FAA IIC. The FAA IIC is normally either an ASI or an AVP-100 air safety investigator assigned to supervise and coordinate all FAA participation in an accident or incident investigation conducted by the NTSB or the military services. The FAA IIC is responsible for the following:

- Assembling the team of technical specialists to conduct the investigation;
- Managing all FAA resources at the scene; and
- Determining if FAA responsibilities were involved in the occurrence.

B. FAA Coordinator. This job title is used by the NTSB and the military services when referring to the FAA IIC.

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C. FAA Participants. FAA participants consist of FAA personnel assigned to assist the FAA IIC and the NTSB IIC. The FAA participants report to the FAA IIC for their group assignments under the NTSB group chairman and directly to the FAA IIC when conducting FAA investigations.

7-12 AIRCRAFT ACCIDENT REPORT. For investigations conducted by the NTSB, the FAA IIC is responsible for obtaining a copy of completed accident reports prepared by the NTSB IIC. The FAA IIC then includes any FAA attachments, except for autopsy reports, which are opinions, and completes FAA Form 8020-23 (refer to FAA Order 8020.11, appendix B, Examples of Forms and Procedures Used by Flight Standards Service). The completed package must then be sent to at least the following offices:

- The Flight Standards division in the region of the occurrence;
- The operator's (certificate holder's) FSDO;
- The aircraft certification directorate responsible for the aircraft type involved; and
- AVP-100.

NOTE: If obtained by the FAA IIC, autopsy reports are sent (unfolded) to the NTSB IIC in an envelope marked "FOR OFFICIAL USE ONLY." These reports should be kept in a separate envelope in the office accident file.

7-13 PTRS INPUT.

A. Use of PTRS Activity Codes. The PTRS will be used to track FAA-conducted investigations and the activities of FAA inspectors during the course of NTSB accident investigations. Either the XX02 or XX03 activity codes will be used to track FAA IIC assistance, and NTSB activity code XX61 (Technical Support Function) will be used by FAA participants.

B. PTRS Record. The FAA IIC will open a PTRS record with activity code XX02 (Accidents On-Site), whether the NTSB IIC conducts an on-scene investigation or not. If the FAA IIC does not travel on scene (usually when the aircraft is missing and presumed to have been involved in an accident, or a known accident site is not accessible), the FAA IIC will open a PTRS record with activity code XX03 (Accident Other). During the course of the investigation, the PTRS record should remain open, using section IV (Comments) to log inspector activities until completion of the NTSB field investigation. Close this PTRS record with a "C." FAA participants of the same specialty providing investigative support will use activity code XX61 (Technical Support Functions) to record their activities. Close this PTRS record with a "C." Do not use an "A" to close this report.

NOTE: The tracking field on the PTRS data sheet, for the inspectors providing technical support, will contain the activity code XX02 or XX03 to link the activity to the investigation.

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1) FAA participants providing investigative support at the accident site will use activity code XX61 (Technical Support Functions) to record their activities. This PTRS record must be closed with a "C" at the conclusion of the support activity.

2) FAA participants providing investigative support not at the accident site will use activity code XX03 (Accident Other) to record their activities. This PTRS record must be closed with a "C." Activity code XX02 must be used in the tracking field to connect the activity to the investigation.

7-14 PAAT. The PAAT is comprised of ASIs who are available to assist a FSDO in the event of a fatal accident involving a part 121 air carrier certificate holder. When an accident occurs, the affected FSDO experiences an increase in demand and workload, along with a high volume of requests for information, often for a period of days or weeks. FSDO staffing may not allow for the timely accommodation and coordination of these demands while continuing to accomplish the required day-to-day activities necessary for effective oversight of the certificate holder(s) assigned to the FSDO. A PAAT can provide immediate, temporary resources and provide assistance to the FSDO with the management of the information demands resulting from an accident. The PAAT will report to the office manager of the FSDO, interface only with FAA personnel, and function in a supporting role only. The PAAT will not conduct an internal evaluation or independent investigation.

RESERVED. Paragraphs 7-15 through 7-30.

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VOLUME 8 GENERAL TECHNICAL FUNCTIONS

CHAPTER 3 MISCELLANEOUS TECHNICAL FUNCTIONS

Section 2 Provide Technical Assistance

8-186 PROGRAM TRACKING AND REPORTING SUBSYSTEM (PTRS) ACTIVITY CODES. 18XX, 38XX, 58XX.

8-187 OBJECTIVE. This section describes procedures for responding to inquiries or requests for assistance. A successful result would be an inspector's response via a written, oral, or electronic communication such as a fax message or email.

8-188 GENERAL. Requests for technical assistance come from many different sources: the public; within the Federal Aviation Administration (FAA); Federal, State, or local government agencies; and so forth. The following paragraphs provide information on handling requests.

A. Accomplishing a Specific Job Function. When the request involves a specific job function covered by this order, refer to that chapter.

B. Providing an Immediate Answer to a Technical Question. An inspector may be able to answer questions or requests directly, using personal knowledge or resources such as those listed in paragraph 8-189 below.

C. Referring Requestor to Another Source. It may be necessary or desirable to refer the requestor to another inspector, another Flight Standards (AFS) office, a government agency or special interest group, or some other source that is better able to respond.

D. Providing Ongoing Technical Assistance. An inspector may be asked to provide ongoing technical assistance to another FAA office or government entity. These requests must be coordinated through the aviation safety inspector's (ASI) supervisor and possibly at a higher level.

E. Obtaining Guidance. For matters that cannot be resolved by the inspector, it may be necessary to coordinate with the regional Flight Standards division (RFSD) through the inspector's supervisor or manager.

8-189 RESOURCES. The following are examples of information sources available to inspectors.

A. FAA Telephone Directory. This directory is an alphabetical listing of FAA facilities. It includes a list of special interest groups (Aircraft Owners and Pilots Association (AOPA), National Association of Flight Instructors (NAFI), etc.), with addresses, telephone numbers, and points of contact (POC) for each listing. This directory also includes a glossary of FAA terms, answers to frequently asked questions (FAQ), information on the FAA's Consumer and Safety Hotlines, and other useful information.

B. Regulatory Guidance Library (RGL).

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C. FAA Order 0000.1, FAA Standard Subject Classification System. This order is a cross reference of numerous subjects contained in FAA orders, and is an excellent source for locating information.

D. Airman's Information Manual (AIM). The AIM has a wide variety of data on air traffic procedures, good operating practices, and other information.

8-190 PREREQUISITES AND COORDINATION REQUIREMENTS.

A. Prerequisites. This task requires knowledge of FAA regulations and policies, Title 14 of the Code of Federal Regulations (14 CFR), and the guidance in this order.

B. Coordination. This task may require coordination with district, regional, or headquarters (HQ) offices in addition to other government agencies.

8-191 REFERENCES, FORMS, AND JOB AIDS.

A. References (current editions):

- Title 14 CFR Parts 1, 61, 91, 125, 133, 135, 137, and 141.
- FAA Order 0000.1, FAA Standard Subject Classification System.
- FAA Telephone Directory.
- Guide to FAA Publications.
- Airman's Information Manual (AIM).

B. Forms. FAA Form 1360-33, Record of Visit, Conference, or Telephone Call.

C. Job Aids. Lists of local agencies, officials, and airport and operator contacts may be developed and approved by the district office manager.

8-192 PROCEDURES.

A. PTRS. Open a PTRS record.

B. Respond to Inquiry. Determine the nature of the inquiry. If the inquiry refers to a job function covered by this Handbook, refer to that chapter. If an immediate answer is unavailable, find out how to contact the individual making the inquiry. Assure the individual that you will respond as soon as possible.

C. Record the Inquiry. Record the inquiry on FAA Form 1360-33.

D. Review Resources. Determine what resources can be used to obtain the information.

E. Request Assistance. If you are unable to locate the necessary information, or if the matter requires coordination, contact other FAA offices or outside agencies as noted in subparagraph 8-188E.

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F. Respond to Inquiry. Once the necessary information is obtained, contact the individual who made the inquiry and share the information.

G. PTRS. Complete the PTRS record.

8-193 TASK OUTCOMES. Completion of this task results in one or more of the following:

- Information provided.
- Accomplish a specific job function.
- Individual referred to another organization.

8-194 FUTURE ACTIVITIES.

- Make recommendations for changes to FAA policy documents such as advisory circulars (AC) or handbooks.
- Provide ongoing technical assistance to another FAA or government office.

RESERVED. Paragraphs 8-195 through 8-209.

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VOLUME 12 INTERNATIONAL AVIATION

CHAPTER 2 FOREIGN AIR CARRIERS OPERATING TO THE UNITED STATES AND FOREIGN OPERATORS OF U.S.-REGISTERED AIRCRAFT ENGAGED IN COMMON CARRIAGE OUTSIDE THE UNITED STATES

Section 7 Part 129 Part H Operations Specifications—Helicopter Terminal Instrument Procedures and Airport Authorizations and Limitations

12-290 PART H OPERATIONS SPECIFICATIONS (OPSPECS). The Federal Aviation Administration (FAA) issues Part H to each foreign air carrier who conducts Title 14 of the Code of Federal Regulations (14 CFR) part 129 instrument flight rules (IFR) operations with helicopters. It is not issued to part 129 foreign air carriers who conduct only fixed-wing airplane operations. Part H is not usually issued to foreign air carriers conducting on-demand helicopter operations who are restricted to visual flight rules (VFR)-only operations.

OPSPEC H101—TERMINAL INSTRUMENT PROCEDURES (Required for All Carriers Conducting IFR Operations).

A. The Intent of OpSpec H101. OpSpec H101 shall be issued to all foreign air carriers who conduct any flight operations under instrument flight rules (IFR) with helicopters, and provides direction and guidance on acceptance of U.S. Terminal Instrument Procedures (TERPS). The paragraph also provides additional guidance to the foreign air carrier for converting any takeoff and landing minimum expressed in the metric linear measurement system to the U.S. standard linear measurement system.

B. No Inspector Input Required. This paragraph requires no inspector input. Additional information concerning TERPS is in Volume 4, Chapter 2.

OPSPEC H102—BASIC INSTRUMENT APPROACH PROCEDURE AUTHORIZATIONS—ALL AIRPORTS—HELICOPTERS (Required for All Carriers Conducting IFR Operations).

A. General. OpSpec H102 specifies the types of instrument approaches the foreign air carrier is authorized to conduct and prohibits the use of other types of instrument approaches. Before authorizing a type of instrument approach procedure (IAP), the principal operations inspector (POI) must ensure that the foreign air carrier has established the aircraft system eligibility and that its manual, which the State of Operator must have approved/accepted, includes both flightcrew training and procedures, as applicable, for the types of approaches to be authorized. All the approaches authorized by OpSpec H102 must be published in accordance with 14 CFR part 97.

B. Three Types of IAPs. Three types of IAPs may be authorized in OpSpec H102:

1) Column one provides for the authorization of nonprecision IAPs without vertical guidance (approaches other than instrument landing system (ILS)). Nonprecision Approaches (NPA) must be conducted in accordance with approved procedures that assure descent will not

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go below minimum descent altitude (MDA) unless the required visual references for continuing the approach are present (refer to 14 CFR part 91, § 91.175).

2) Column two provides for the authorization of precision-like instrument approach procedures with vertical guidance (APV) (approaches other than ILS). These are called precision-like approaches because they provide vertical guidance but are not as accurate as true precision approaches. Foreign air carriers must conduct these precision-like approach procedures using an approved method that allows descent to a published decision altitude (DA).

3) Column three provides for the authorization of precision IAPs (ILS and Global Positioning System (GPS) Landing System (GLS) approaches) that provide vertical guidance.

C. Barometric Vertical Navigation (Baro-VNAV) Approach Operations. Baro-VNAV approach operations (referred to as Area Navigation (RNAV) with vertical guidance) may be authorized for all applicable foreign air carriers in accordance with the guidance contained in Volume 4, Chapter 2, Section 5 and the current edition of Advisory Circular (AC) 120-29, Criteria for Approval of Category I and Category II Weather Minima for Approach.

1) Air Carrier Aircraft/Commercial Operator Approval. Once a foreign air carrier has established the aircraft system eligibility and the flightcrew training and checking requirements in the manual that the State of Operator approved/accepted, as applicable, the POI may give approval to use this RNAV equipment to fly to the lateral navigation (LNAV)/vertical navigation (VNAV) DA as shown on the published IAP.

2) Authorization. To authorize these precision-like approaches that provide vertical guidance, select “RNAV (GPS)” for insertion into column two of OpSpec H102.

D. Precision Runway Monitor (PRM) Approaches. This section provides information for approving simultaneous instrument approaches to closely spaced parallel runways: ILS/PRM and localizer-type directional aid (LDA)/PRM. PRM enables simultaneous operations to parallel runways spaced closer than 4,300 feet apart in instrument meteorological conditions (IMC). Foreign air carriers will be authorized PRM approaches in OpSpec H102. Definitions of ILS/PRM and LDA/PRM have been added to OpSpec A002. Two types of IAPs with PRM are currently in use:

1) ILS/PRM. This operation comprises two ILSs, each aligned with its respective runway and parallel to each other. ILS/PRM permits simultaneous instrument approach operations to parallel runways spaced less than 4,300 feet apart, but not less than 3,000 feet.

2) LDA/PRM (Simultaneous Offset Instrument Approaches (SOIA)). This operation comprises one ILS and LDA with glideslope. The ILS is aligned with its runway, but the LDA serving the second runway is offset (no more than 3 degrees) from a parallel track. This offset permits simultaneous instrument approach operations to parallel runways spaced less than 3,000 feet apart, but no less than 750 feet. Because of the offset, this operation is also known as an SOIA.

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E. PRM. The FAA began the Multiple Parallel Approach Program (MPAP) to research whether simultaneous ILS approaches to parallel runways would improve capacity. The objective was to achieve improvements in airport arrival rates through the conduct of simultaneous close spaces parallel approaches. That objective is being met using the PRM.

1) ILS/PRM and LDA/PRM Approaches. Where parallel runway centerlines (RCL) are 4,300 feet apart or less, but not less than 3,000 feet, simultaneous ILS approaches may be conducted. Similarly, where parallel RCLs are 3,000 feet apart or less, but not less than 750 feet, an SOIA may be conducted with ILS approaches. Those approaches are labeled "ILS/PRM" and "LDA/PRM," respectively, on instrument approach charts. Air traffic control (ATC) provides an air traffic controller using special PRM radar during these approaches. That controller is known as the final monitor controller.

2) The Breakout Maneuver. Working with industry, the FAA conducted extensive analysis of simulation data and determined that the implementation of PRM and SOIA approach operations to closely spaced parallel runways requires additional crew training. The primary focus of this training is to raise each pilot's situational awareness (SA) in ILS/PRM and LDA/PRM operations. Flightcrews must fly the breakout maneuver manually.

a) Traffic Alert. One important element of the additional training is that the pilot understands the difference between a normal missed approach initiated by a pilot and a breakout initiated by a PRM final monitor controller. It must be clear to flightcrews that when the final monitor controller uses the words "Traffic Alert," the controller will then give critical instructions that the pilot must act on promptly to preserve adequate separation from an aircraft straying into the adjoining approach path.

b) ATC Breakout Maneuver Command to Turn and/or Descend, Climb, or Maintain Altitude. The flightcrew must immediately follow the final monitor controller's vertical (climb/descend/maintain altitude) and horizontal (turn) commands. If the flightcrew is operating the Traffic Alert and Collision Avoidance System (TCAS) in the traffic advisory (TA)/Resolution Advisory (RA) mode and receives a TCAS RA at any time while following the final monitor controller's command, the flightcrew will simultaneously continue to turn to the controller's assigned heading and follow the vertical guidance provided by the TCAS RA.

c) Time-to-Turn Standard. Regardless of aircraft type, tests and data analysis revealed that pilots must be able to achieve a rate of turn of 3 degrees per second within 8 seconds of receiving a breakout command. The air carrier must show that its pilots can readily meet this time-to-turn standard before the POI will authorize ILS/PRM or LDA/PRM approaches in OpSpec H102. The FAA requires flightcrews to manually fly the breakout maneuver. (Flight Technologies and Procedures Division (AFS-400) concurrence is required to approve breakout in auto modes.) The foreign air carrier should demonstrate its ability to meet this standard by having representative pilots perform the breakout maneuver while the POI or the POI's designated representative observes. The demonstration should conform to procedures contained in the air carrier's approved operating manual for its flightcrews.

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NOTE: In a breakout, ATC will never command a descent below the applicable minimum vector altitude (MVA), thus assuring that no flight will be commanded to descend below 1,000 feet above the highest obstacle during a breakout.

3) ILS/PRM, LDA/PRM, and the Use of TCAS. TCAS may be operated in TA/RA mode while executing ILS/PRM or LDA/PRM approaches. However, when conducting these operations, pilots must understand that the final monitor controller's instruction to turn is the primary means for ensuring safe separation from another aircraft. Pilots must bear in mind that TCAS does not provide separation in the horizontal plane; TCAS accomplishes separation by commands solely in the vertical plane. Therefore, during final approach, only the final monitor controller has the capability to command a turn for lateral separation. Flightcrews are expected to follow any ATC instruction to turn.

a) ATC Command to Turn with TCAS RA. In the unlikely event that a flightcrew should simultaneously receive a final monitor controller's command to turn and a TCAS RA, the flightcrew must follow both the final monitor controller's turn command and the TCAS RA's climb or descent command.

b) TCAS RA Alone. In the extremely unlikely event that an RA occurs without a concurrent breakout instruction from the final monitor controller, the pilot should follow the RA and advise the controller of the action taken as soon as possible. In this instance, it is likely that a breakout command would follow.

c) TCAS Not Required. An operative TCAS is not required to conduct ILS/PRM or LDA/PRM approaches.

4) Required and Recommended Training for ILS/PRM and LDA/PRM Approaches. A foreign air carrier must include required training in its training program and the State of Operator must approve that training before the FAA may authorize either or both PRM approaches in OpSpec H102. Flightcrews must accomplish required ground training before conducting ILS/PRM or LDA/PRM approaches. Normally for foreign-registered aircraft, International Field Office (IFO)/International Field Unit (IFU)/Flight Standards District Office (FSDO) inspectors will only need to examine the foreign OpSpecs, other Air Operator Certificate (AOC) special operating provisions, or documented evidence of foreign Civil Aviation Authority (CAA) approval. If the IFO/IFU/FSDO believes it to be necessary in the interest of safety to verify such training authorization, however, IFO/IFU/FSDO inspectors may require that the operator submit the following:

a) Initial Ground Training—Required.

1. This training must include all elements of the "Attention to All Users" page of an ILS/PRM or an LDA/PRM, as authorized, along with viewing the latest version of the PRM video. (Refer to the video at http://www.faa.gov/education_research/training/prm or contact the FAA Flight Standards (AFS) at 202-267-8166 for the most current version.)

NOTE: The FAA does not require flightcrews trained previously in PRM operations under earlier guidance to requalify with each new version of the PRM video.

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2. The ground portion of the training program must support the following knowledge objectives. Each flightcrew member must:

a. Describe the PRM system to include the meaning of "no transgression zones."

b. Know that an aircraft on an adjacent approach path may be less than 4,300 feet away and may be flying at a different speed.

c. Know that the automated terminal information service (ATIS) broadcasts a pilot advisory when ILS/PRM or LDA/PRM approaches are in progress.

d. Identify the differences between ILS/PRM approach charts and normal ILS approach charts, including the special instruction pages for ILS/PRM.

e. Explain the unique communication requirements (equipment and procedures) for ILS/PRM and LDA/PRM approaches.

f. Know that an unpublished missed approach instruction that ATC may issue prior to missed approach points is called a "breakout."

g. Know that a breakout may include instructions to descend and that the descent will be to no lower than the MVA for the sector. The MVA guarantees 1,000 feet above the highest obstruction in that sector. The rate of descent controllers expect is not more than 1,000 feet per minute.

h. Know that a pilot must initiate a breakout maneuver manually and immediately upon hearing the "Traffic Alert" command from ATC, and that adequate separation requires that the pilot establish a 3-degree-per-second rate of turn within 8 seconds.

i. Know that the three areas (ATIS, Dual very high frequency (VHF) Comm. Required, and All "Breakouts") in the "Attention to All Users Page" must be briefed (in flight) prior to conducting an ILS/PRM or an LDA/PRM approach.

j. Know that flightcrews may operate TCAS in the TA/RA mode when conducting PRM approaches, including the following points:

- When an RA occurs with a concurrent ATC breakout command: follow the turn required in the ATC instructions; follow the climb or descent in the RA command (split commands).
- When an RA occurs without a concurrent ATC breakout command: follow the RA and contact ATC as soon as practical.
- TCAS provides only vertical resolution to aircraft conflicts.
- An operative TCAS is not required for PRM operations.

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k. Know procedures for SOIA, including the following points:

- A visual segment of the LDA/PRM approach is established prior to the LDA missed approach point (MAP) to permit visual acquisition of the ILS traffic to the parallel runway and advising ATC, and visual acquisition of the runway environment.
- LDA course is maintained until the MAP. At the MAP, the pilot must have the ILS traffic in sight and the runway environment in sight, or fly the missed approach.
- At the MAP with the ILS traffic and the runway in sight, the pilot may continue to a landing and maneuver to align with the RCL; stabilize on glidepath no lower than 500 feet above touchdown zone (TDZ); and avoid wake turbulence from the ILS traffic.

3. The FAA recommends testing of these knowledge objectives.

b) Initial Flight Training.

1. Required:

- Breakout maneuver, and
- LDA/PRM approach.

NOTE: Initial breakout flight training must focus on the descending breakout.

NOTE: Air carriers applying for initial approval to conduct PRM approaches must complete breakout flight training by the end of the next full training cycle after receiving OpSpec approval.

NOTE: The FAA may authorize air carriers to conduct ILS/PRM approaches, LDA/PRM approaches, or both. The FAA does not require duplicative flight training in the breakout maneuver (i.e., breakout covered in flight training for ILS/PRM is creditable toward the LDA/PRM, and vice versa).

2. Recommended: ILS/PRM approach (if authorized on OpSpecs).

c) Recurrent Ground Training—Required: Review of the ground training elements and the video discussed in subparagraph E4)a)*1* above and testing in those elements.

d) Recurrent Flight Training:

1. Required: None.

2. Recommended:

- ILS/PRM approach,
- LDA/PRM approach, and
- Breakout.

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5) Authorizing ILS/PRM Approaches and LDA/PRM Approaches for 14 CFR Part 129 Foreign Air Carriers. A part 129 foreign air carrier operating in the United States may be authorized in OpSpec H102 to conduct ILS/PRM approaches and/or LDA/PRM approaches if:

a) That foreign air carrier meets the ground and flight training requirements contained in subparagraphs E4)a) through c);

b) The CAA for the foreign air carrier authorizes these approaches; and

c) The air carrier's POI determines the following:

1. That a point of contact (POC) for the foreign air carrier's CAA has been established in the foreign air carrier's OpSpec A006(c); and

2. The IFO/FSDO has notified the International Programs and Policy Division (AFS-50) that the foreign air carrier is authorized to conduct PRM approaches.

NOTE: AFS-50 must notify FAA Air Traffic Procedures (ATP-100) of each foreign air carrier authorized to conduct PRM approaches.

OPSPEC H103—STRAIGHT-IN CAT I NONPRECISION APPROACH PROCEDURES—ALL AIRPORTS—HELICOPTERS (Required for All Carriers Conducting IFR Operations). OpSpec H103 shall be issued to all foreign air carriers conducting instrument flight rules (IFR) operations with helicopters. This paragraph specifies the lowest landing minimums that can be used for Category (CAT) I Nonprecision Approach (NPA) procedures other than instrument landing system (ILS), or Global Positioning System (GPS) Landing System (GLS) at all airports to authorize straight-in CAT I ILS or GLS approach procedures and IFR landing minimums, OpSpec H117 must be issued. The previous NPA table now refers to CAT I NPAs as "approaches other than ILS or GPS Landing System (GLS)."

OPSPEC H104—HELICOPTER EN ROUTE DESCENT AREAS (HEDA) (OPTIONAL).

A. The Intent of OpSpec H104. The FAA issues OpSpec H104 to all operators authorized to conduct instrument flight rules (IFR) helicopter operations using helicopter en route descent procedures within specified areas of operation. It is not issued to helicopter operators who are not authorized to use helicopter en route descent procedures.

B. Before Being Authorized to Conduct HEDAs. Before being authorized to conduct HEDAs, each operator who applies must have at least one helicopter equipped with the airborne radar approved for HEDA use, an IFR-approved GPS or long-range navigation-C system (LORAN-C) navigation receiver, and radio altimeter (RA). The GPS navigation equipment must meet the minimum requirements of Technical Standard Order (TSO)-C129, Airborne Supplemental Navigation Equipment using the Global Positioning System (GPS), with an external course deviation indicator (CDI) or horizontal situation indicator (HSI) mounted in the pilot's primary instrument scan. Volume 4, Chapter 1 provides guidance for approval of this equipment to be used as the sole means for long-range navigation (LORAN). The airborne radar minimum requirements are stated in paragraph 2–1 of the current edition of Advisory Circular

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(AC) 90-80, Approval of Offshore Standard Approach Procedures (OSAP), Airborne Radar Approaches (ARA), and Helicopter En Route Descent Areas (HEDA). Airworthiness requirements are stated in AC 90-80, paragraph 2-2. Maintenance requirements are stated in AC 90-80, paragraph 2-3. Inspection and test procedures are stated in AC 90-80, paragraph 2-4.

C. Guidance. Volume 4, Chapter 7, and 14 CFR part 91 subpart B provide guidance for weather reporting requirements and preflight action. Training programs, procedure development criteria, and requests for approval are stated in AC 90-80, Chapter 4.

D. Requirements. All authorized HEDAs must be listed in the OpSpecs of all operators conducting HEDA operations. The lowest altitude must be listed in Table 2 and must not be lower than 400 feet radio altitude (RA). HEDA must also be selected as an authorized type of approach in OpSpec H102.

OPSPEC H105—ALTERNATE AIRPORT IFR WEATHER MINIMUMS (Required for All Carriers Conducting IFR Operations).

A. Intent of OpSpec H105. OpSpec H105 shall be issued to all foreign air carriers who conduct instrument flight rules (IFR) operations with helicopters. This paragraph provides a table from which the operator, during the initial dispatch or flight release planning segment of a flight, derives U.S. alternate airport IFR weather minimums in those cases where it has been determined that an alternate airport is required.

B. Approach Procedures. The table is for airports with at least one operational navigational facility providing a straight-in Nonprecision Approach (NPA) procedure, or a straight-in precision approach procedure, or, when applicable, a circling maneuver from an instrument approach procedure (IAP). The required ceiling and visibility is obtained by adding 200 feet to the Category (CAT) I height above touchdown (HAT) or, when applicable, the authorized height above airport (HAA) and by using 1 statute mile (sm) visibility, but never less than the published minimum visibility for the approach to be flown.

OPSPEC H106—IFR TAKEOFF MINIMUMS, HELICOPTER OPERATIONS—ALL AIRPORTS (Required for All Carriers Conducting IFR Operations). OpSpec H106 is issued to all 14 CFR part 129 operators who conduct instrument flight rules (IFR) helicopter operations. Only OpSpec H106 subparagraphs a and b will be printed for issuance when an operator is not authorized to use lower-than-standard takeoff minimums. OpSpec H106 subparagraphs a, b, and c will be printed for issuance when the operator is authorized to use takeoff minimums equal to the lowest straight-in landing minimums. OpSpec H116 must also be issued when the operator is authorized to use takeoff minimums lower than ½ mile (mi) or 1800 Runway Visual Range (RVR).

OPSPEC H107–H112. RESERVED.

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OPSPEC H113—SPECIAL TERMINAL AREA IFR ROTORCRAFT OPERATIONS IN CLASS G AIRSPACE—NONSCHEDULED PASSENGER AND ALL-CARGO OPERATIONS.

A. The Intent of OpSpec H113. OpSpec H113 authorizes a foreign air carrier to conduct nonscheduled passenger and all-cargo (scheduled and nonscheduled) terminal area instrument flight rules (IFR) operations in Class G airspace.

B. Principal Operations Inspector (POI) Responsibilities Before Authorizing OpSpec H113. Before authorizing OpSpec H113, the POI must determine that the foreign air carrier's Civil Aviation Authority (CAA) has authorized/approved it for these types of operations and has a method or procedure for obtaining and disseminating necessary operational information. This operational information must include the following:

1) Documentation that the airport is served by an authorized instrument approach procedure (IAP) (and departure procedures (DP) when applicable).

2) Applicable charts for crewmember use.

3) Operational weather data from an approved source for control of flight movements and crewmember use.

4) Status of airport services and facilities at the time of the operation.

5) Suitable means for pilots to obtain traffic advisories (TA).

6) Sources of TAs and airport advisories.

C. Foreign Air Carrier Authorization. Foreign air carriers may be authorized to use any two-way radio source of air TA information listed in the Aeronautical Information Manual (AIM) (for operations in U.S. airspace) or equivalent Aeronautical Information Publications (AIP).

1) These sources include common traffic advisory frequencies (CTAF), Aeronautical Advisory Station (UNICOM), MULTICOM, and Flight Service Stations (FSS).

2) In those cases where two sources are listed at the same airport, inspectors must ensure that the carrier's manuals have procedures that require pilots to continuously monitor and use the TA frequency when operating within 10 nautical miles (NM) of the airport. The procedures should require communication concerning airport services and facilities to be completed while more than 10 NM from the airport.

3) At some airports, no public use frequencies may be available. In those cases, a certificate holder must arrange for radio communication of essential information, including surveillance of local or transient aircraft operations by ground personnel. Ground personnel who operate a company radio for airport status and TAs must be able to view airspace around the airport.

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D. Before the FAA Issues OpSpec H113. Before the FAA issues OpSpec H113, the foreign air carrier must provide documentation to the POI showing that it has the required methods or procedures and arrangements in place for obtaining and disseminating necessary operational information and that its CAA has accepted/approved the procedures. The FAA may need to issue OpSpecs H113 and/or H121 to the foreign air carrier in order to issue OpSpec H122, which authorizes the use of special (non-14 CFR part 97) IAPs or DPs.

NOTE: Presently, although developed, OpSpec H122 is not authorized for foreign air carriers (see OpSpec H122).

OPSPEC H114–H115. RESERVED.

OPSPEC H116—IFR LOWER-THAN-STANDARD TAKEOFF MINIMUMS, HELICOPTER OPERATIONS (OPTIONAL).

A. The Intent of OpSpec H116. The FAA issues OpSpec H116 to a foreign air carrier to authorize lower-than-standard takeoff minimums. This OpSpec contains specific guidance regarding pilots, aircraft, and airports when lower-than-standard takeoff minimums are used. This section contains information that operations inspectors will use when issuing lower-than-standard takeoff minimums for foreign air carriers operating helicopters.

B. Principal Operations Inspector (POI) Responsibilities. POIs shall ensure that foreign air carriers requesting lower-than-standard takeoff minimums provide procedures and training to their personnel, which has been approved by the State of Operator, in all areas referenced in the OpSpec. Normally for foreign-registered aircraft, International Field Office (IFO)/International Field Unit (IFU)/Flight Standards District Office (FSDO) inspectors will only need to examine the foreign OpSpecs, other Air Operator Certificate (AOC) special operating provisions, or documented evidence of foreign Civil Aviation Authority (CAA) approval. If the IFO/IFU/FSDO believes it to be necessary in the interest of safety, however, IFO/IFU/FSDO inspectors must ensure procedures and training programs contain at least the following:

- Rejected takeoffs in a low visibility environment,
- Engine failure in low visibility,
- Taxiing in a low visibility environment with emphasis on preventing runway incursion,
- Critical areas,
- Crew coordination and planning,
- Dispatcher training,
- Procedures for operators not using dispatch systems,
- Required ground-based visual aids (such as stop bars and taxi holding position lights),
- Required ground-based electronic aids (such as instrument landing system (ILS) transmissometers), and/or
- Determination of takeoff alternate airports, as applicable.

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C. Lower-Than-Standard Takeoff Minimums. Lower-than-standard takeoff minimums that foreign air carriers exercise under these OpSpecs shall not be less than those lower-than-standard takeoff minimums that the State of Operator authorizes.

NOTE: POIs should be aware that there may be additional limitations and guidance for specific helicopters in Flight Standardization Board (FSB) reports.

OPSPEC H117—STRAIGHT-IN CAT I PRECISION INSTRUMENT APPROACH PROCEDURES—ALL AIRPORTS (Required for All Carriers Conducting IFR Operations). OpSpec H117 authorizes the lowest straight-in Category (CAT) I precision approach procedures and instrument flight rules (IFR) landing minima. These precision approaches are also referred to as CAT I, instrument landing system (ILS), or Global Positioning System (GPS) Landing System (GLS) approach procedures.

A. Changes in Lighting Systems Configurations. The visibility requirement for medium intensity approach lighting systems (MALS) and simplified short approach lighting systems (SSALS) configurations was changed from ¾ mile (mi) and 4000 Runway Visual Range (RVR) to ½ mi and 2400 RVR to allow credit for a full lighting system. Three-fourths mi and 4000 RVR is applied when there are no lights, and full lighting system credit is ½ statute mile (sm) and 2400 RVR. If the helicopter flies the CAT A approach to a runway, the visibility can be reduced to ¼ sm and 1600 RVR. (Refer to the current edition of FAA Order 8260.3, United States Standard for Terminal Instrument Procedures (TERPS), page 3-15.)

B. Precision Approaches. European Aviation Safety Agency (EASA) precision approaches are now referred to as ILS or GLS and reference is made to the Official Journal of the European Union, Annex I, Definitions, for terms used in Annexes II to V.

C. Approved Equipment List Expansion Per OpSpec C052. OpSpec C052 expands the approved equipment list for operators also operating airplanes to include the use of flight directors (FD) by authorized operators flying “Authorization Required (AR)” (Special CAT I) minima. CAT I approach charts may depict two blocks of minima: the standard and the “AR” minima. At selected locations, the principal operations inspector (POI) should allow authorized operators to use the special minima, provided an approved autopilot with automatic tracking capability (approach couple), approved Head-Up-Guidance System (HGS), or FD approved for CAT I operations, is used on the approach.

1) Approval. Both air carrier and private operators may continue to use the standard CAT I minima without alteration of current authorizations or procedures; however, operators must obtain FAA approval to use the special CAT I minima. To obtain this approval, field offices will issue authorizations to air carrier operators by issuing OpSpecs.

2) Conditions of Approval. Before issuing an authorization to use special CAT I minima, inspectors must ensure that each operator meets the following conditions:

a) The authorized aircraft must be equipped with an approved autopilot approach coupler, HGS, or FD system that provides guidance to decision height (DH). Inspectors must establish that the approach coupler, HGS, or FD are certified for use down to an altitude of 200 feet above ground level (AGL) or lower.

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b) The flightcrew procedures.

c) The pilot in command (PIC) must use the automatic flight control guidance system (AFCGS), HGS, or FD to DH or to the initiation of a missed approach, unless visual references with the runway environment are established, thus allowing safe continuation to a landing. If the AFCGS, HGS, or FD malfunctions or becomes disconnected, the PIC may not descend below standard minima unless the runway environment is in sight.

OPSPEC H118—CATEGORY I IFR LANDING MINIMUMS—CIRCLE-TO-LAND APPROACH MANEUVER (Required for All Carriers Conducting IFR Operations).

A. The Intent of OpSpec H118. OpSpec H118 is issued to foreign air carriers who conduct circling approach maneuver operations with rotorcraft. OpSpec H118 specifies the lowest minimums that can be used for Category (CAT) I circling approach maneuvers.

B. Circle-to-Land Maneuvers. For the purpose of this OpSpec authorization, any foreign air carrier issued this paragraph is authorized to conduct circle-to-land maneuvers. In any weather condition, a foreign air carrier that permits its pilots to accept a “circle to land” or a “circle to runway (runway number)” clearance from air traffic control (ATC) conducts circle-to-land maneuvers. The term “circle-to-land maneuver” includes the maneuver that is referenced in various regulations, publications, and documents as “circle-to-land maneuver,” “circling,” “circling maneuver,” “circle,” “circling approach,” and “circling approach maneuver.” With regard to pilots, “conducting” a circle-to-land maneuver means to act as the Pilot Flying (PF) when a circle-to-land maneuver is being conducted.

C. Aircraft Operating Under Instrument Flight Rules (IFR) During All Circle-to-Land Maneuvers. Aircraft operating under IFR during all circle-to-land maneuvers are required to remain clear of clouds. If the flightcrew loses visual reference to the airport while conducting a circle-to-land maneuver, they must follow the missed approach procedure specified for the applicable instrument approach, unless ATC specifies an alternate missed approach procedure.

D. Two Separate Provisions. Foreign air carriers may conduct circle-to-land maneuvers under two separate provisions contained within OpSpec H118 subparagraph a.

1) Foreign air carriers whose pilots have been trained and checked for the circling maneuver in accordance with the foreign air carrier’s Civil Aviation Authority (CAA)-approved training program, may conduct a circle-to-land maneuver:

a) At the published circling landing minimums for the instrument approach to be used; or

b) At the minimums specified in the chart contained within the OpSpec H118, whichever is higher.

NOTE: Any pilot who possesses a pilot certificate restricting circling approaches to visual meteorological conditions (VMC) is not eligible to conduct circle-to-land maneuvers except as provided in subparagraph D2) below.

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2) Foreign air carriers conducting circle-to-land maneuvers without training and checking must use a minimum descent altitude (MDA) of 1,000 feet height above airport (HAA) or the MDA of the published circling landing minimums for the instrument approach to be used, whichever is higher. Foreign air carriers that conduct a circle-to-land maneuver under this provision remain under an IFR clearance and must comply with those procedures otherwise required for circle-to-land maneuvers. The foreign air carrier may conduct a circle-to-land maneuver when:

a) The reported ceiling is at least 1,000 feet and the visibility is at least 3 miles (mi); or

b) The reported weather is at least equal to the published circling landing minimums for the instrument approach to be used, whichever is higher.

E. Documentation Submissions before Issuing OpSpec H118. Before issuing OpSpec H118 authorizing circling approaches, the foreign air carrier must submit documentation showing that their crewmember training program, approved by their CAA, provides the appropriate training and checking on circling approaches and that their CAA has approved circling approach maneuvers for the carrier.

OPSPEC H119–H120. RESERVED.

OPSPEC H121—SPECIAL TERMINAL IFR ROTORCRAFT OPERATIONS IN CLASS G AIRSPACE—SCHEDULED PASSENGER OPERATIONS (OPTIONAL).

A. The Intent of OpSpec H121. The FAA issues OpSpec H121 to authorize a foreign air carrier to conduct terminal area rotorcraft instrument flight rules (IFR) operations for scheduled passenger operations in Class G airspace.

B. Principal Operations Inspector (POI) Determinations Before Authorizing OpSpec H121. Before authorizing OpSpec H121, the POI must determine that the foreign air carrier's Civil Aviation Authority (CAA) has authorized/approved it for these types of operations, and the POI must obtain and list the following information in OpSpec H121:

1) Names of airports.

2) Sources of weather information flightcrews must use (see Volume 3, Chapter 26, Section 4).

3) Sources of traffic advisories (TA) and airport advisories.

C. Sources of TAs and Airport Advisories. Foreign air carriers may be authorized to use any two-way radio source of air TA information listed in the Aeronautical Information Manual (AIM) (for operations in U.S. airspace) or equivalent Aeronautical Information Publications (AIP).

1) These sources include common traffic advisory frequencies (CTAF), Aeronautical Advisory Station (UNICOM), MULTICOM, and Flight Service Stations (FSS).

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2) If an air TA source is also suitable for determining the status of airport services and facilities, it is the only source that needs to be listed in OpSpec C080.

3) When airport services and facilities information is on a different frequency, both sources should be listed in OpSpec H121.

4) In those cases where two sources are listed at the same airport, inspectors must ensure that the foreign air carrier's manuals have procedures that require pilots to continuously monitor and use the TA frequency when operating within 10 nautical miles (NM) of the airport. The procedures should require communications about airport services and facilities that pilots must complete while more than 10 NM from the airport.

5) At some airports, no public use frequencies may be available. In those cases, a foreign air carrier must arrange for radio communication of essential information, including surveillance of local or transient aircraft operations by ground personnel. Ground personnel who provide airport status and TA reports using a company radio must be able to view airspace around the airport.

D. Document Submissions Before Issuing OpSpec H121. Before issuing OpSpec H121, the foreign air carrier must provide documentation to the POI showing that they have the required methods or procedures and arrangements in place for obtaining and disseminating necessary operational information and they are accepted/approved by their CAA. The FAA may need to issue OpSpec H121 to the foreign air carrier authorized scheduled passenger operations in order to issue OpSpec H122.

OPSPEC H122—SPECIAL NON-14 CFR PART 97 INSTRUMENT APPROACH OR DEPARTURE PROCEDURES FOR ROTORCRAFT OPERATIONS (OPTIONAL). OpSpec H122 authorizes special non-14 CFR part 97 instrument approach procedures (IAP) or departure procedures (DP) with rotorcraft. Although the FAA has prepared this OpSpec for future use and the OpSpec is available in the Web-based Operations Safety System (WebOPSS), presently it does not apply to 14 CFR part 129. The U.S. Notice to Airmen (NOTAM) system does not cover non-part 97 IAPs or DPs and no system is in place for foreign air carriers to obtain necessary operational status, etc. The FAA plans to include non-part 97 IAPs or DPs in the NOTAM system in the near future. For current information on special Terminal Instrument Procedures (TERPS) for foreign carriers, contact the International Programs and Policy Division (AFS-50).

OPSPEC H123–H199. RESERVED.

RESERVED. Paragraphs 12-291 through 12-324.

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VOLUME 12 INTERNATIONAL AVIATION

CHAPTER 13 STANDARDIZED BILLING FOR FEES COLLECTED UNDER PART 187

Section 2 Instructions for Flight Standards Service Offices

12-707 PURPOSE. These instructions apply to all Flight Standards Service (AFS) offices or units that are required to assess charges for services and approvals performed outside the United States that are billable under the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 187.

NOTE: Title 49 of the United States Code (49 U.S.C.) § 40102(a)(46) defines the United States as "… the States of the United States, the District of Columbia, and the territories and possessions of the United States, including the territorial waters and the overlying airspace."

12-708 CHARGEABLE EVENTS.

A. Events Outlined in Advisory Circular (AC) 187-1, Flight Standards Service Schedule of Charges Outside the United States (current edition).

1) Charges in AC 187-1 are divided into three types:

a) Transportation and subsistence charges.

b) Airman certification.

c) Air agencies (fixed charges for approvals or authorization for airmen or designees and hourly rates for agencies).

2) Of these three areas, two are charged in two different methods:

a) Fixed charges are set in part 187 for airmen.

b) Hourly charges are set in part 187 for air agencies.

B. Fixed Charges.

1) Fixed charges are for services provided to either airmen or designees when those services are conducted outside of the United States.

a) Charges for airmen or designees should be assessed for each authorization conducted. If there are multiple authorizations conducted in a single event, all of the charges should be applied.

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b) For example, if an airman is given an authorization to take the test for the Airframe and Powerplant (A&P) certificates, the airman should be assessed for each of the authorizations (General, Airframe, and Powerplant).

2) If transportation and subsistence were incurred to provide this service, those actual costs should also be assessed.

a) Proportional transportation and subsistence are assessed when services are rendered to multiple airmen and/or air agencies when services provided to them were completed on the same trip.

b) When proportional transportation and subsistence charges cannot be assessed in advance because the number of applicants is unknown, inspectors should:

1. Charge the appropriate fixed fee charges for services rendered.

2. Notify all parties that they will be billed for transportation and subsistence upon return to the office and completion of the Single Trip—Multiple Agency Site Visit Form.

C. Hourly Charges. Hourly rates are assessed to agencies for services provided in relation to certifications/inspections as outlined in AC 187-1 for each inspector work/travel hour.

1) All transportation and subsistence costs are charged to agencies in association with certification/inspection and renewal of their certificates.

2) Proportional transportation and subsistence costs are assessed when services are rendered to multiple airmen and/or air agencies when services provided to them were completed on the same trip.

D. Proportional Charges for Transportation and Subsistence.

1) Proportional charges for transportation and subsistence will be divided between each of the airmen, designees, and agencies visited in any single trip.

a) Charges for lodging and meals and incidental expenses (M&IE) will be divided by the number of hours spent at/with each agency or airman/designee.

b) Other expenses (e.g., taxis, automated teller machines (ATM), tolls, international fees) associated with traveling will be divided equally by the number of agencies or airmen/designees visited.

2) Proportional charges are calculated using the Multiple Air Agency Onsite Accounting Form found on the International Programs and Policy Division (AFS-50) SharePoint Web site at https://avssp.faa.gov/avs/afs50/187billing/SitePages/Home.aspx. The Master accounting forms will be found in the quick launch (left side of home page).

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12-709 BILLING PROCEDURES.

A. Airman/Designee Billing.

1) Walk-In, or No Associated Transportation and Subsistence Cost.

a) Outside of the United States, transportation and subsistence will be assessed to applicants in addition to the fixed charges published in AC 187-1.

NOTE: United States Embassies and U.S. military installations located outside the United States are "outside the United States" under the definition of 49 U.S.C. § 40102(a)(46) (see paragraph 12-707). Applicants for Federal Aviation Administration (FAA) services from United States Embassies or U.S. military installations located outside the United States will pay the appropriate fee.

b) Charges are assessed for each authorization or approval granted and added together, determining total due, and are logged on the Airman Master Accounting Form (see Figure 12-15B, Locating the Airman Master Accounting Form (UPDATE)).

Figure 12-15B. Locating the Airman Master Accounting Form (UPDATE)

2) Charges with Transportation and Subsistence.

a) If travel was solely in support of the individual, then assess all charges appropriate for the services provided and add all associated transportation and subsistence cost to the Airman Master Accounting Form to ascertain the total due.

b) If the travel conducted was also in support of other airmen and/or agencies, see subparagraph 12-709C for instructions on calculating proportional charges. Once that is done, proceed with collection of charges as below.

3) Collection of Charges. All fees collected from an individual or single air agency should be properly mailed to, or processed through, the International Field Office (IFO) using a credit card online at www.pay.gov. An inspector should never take payment in either cash or check from any entity. The Airman and Air Agency Master Accounting Form must be completed for each entity charged. Once payment is received, a receipt of funds and authorization or

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certificate should be sent by the receiving office. See Figure 12-17, Example Billing Letter for Air Agencies, and Figure 12-17A, Example Billing Letter for Air Agencies, for sample letters.

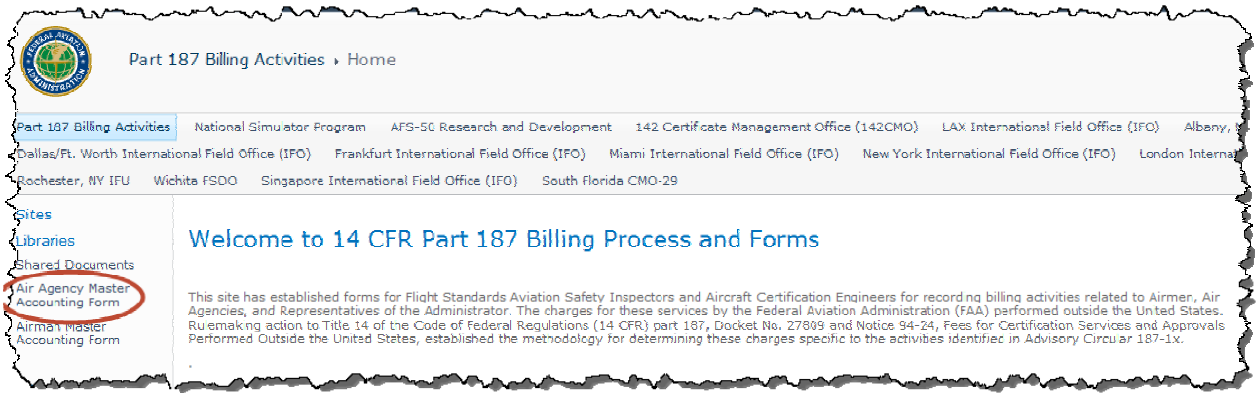
B. Agency Billing.

1) Offsite/Office Work.

a) All inspector hours expended in support of certification/renewal or inspection of air agencies/entities are recorded on the SharePoint Single-Trip Accounting Form specific to that agency. Each time an individual inspector works on any billable task for a specific agency, the time expended must be added to the agency's specific Air Agency Master Accounting Form (see Figure 12-15C, Locating the Air Agency Master Accounting Form).

b) Each entry will be a new entry with the specific job task accomplished and any comments the inspector would like to add. To add a new entry, click on the blue icon next to "insert item" and a new line will drop down. All accumulated time is automatically filled to the master accounting form at the bottom of the page, assuring accurate calculations for billing. This requirement continues throughout the billing cycle until all tasks are completed and the company is billed.

Figure 12-15C. Locating the Air Agency Master Accounting Form



2) Onsite.

a) Upon completion of an onsite certification or *renewal* inspection, all participating inspectors will enter their billable hours and associated transportation and subsistence costs into the single trip accounting form for that particular agency on the IFO/International Field Unit (IFU) SharePoint site. If travel was in support of multiple individuals or agencies, then see subparagraph 12-709C to establish individual agency proportional costs. Upon completion of all associated renewal functions, proceed with the agency billing process in subparagraph 12-709D.

b) For an *inspection without renewal*, all inspector hours and associated transportation and subsistence costs for inspector work associated with maintaining a certificate or certification/renewal will be recorded on the single trip accounting form on the IFO/IFU

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SharePoint site. Each individual should record his or her time and transportation and subsistence costs. The sheet will remain open until final billing. If travel was in support of multiple individuals or agencies, then see subparagraph 12-709C to establish the entities' individual proportional costs. After the onsite fees have been established on the multiple sheets, the amounts will be transferred manually to the "On Site Billable Hours" portion of the Master Accounting Form.

NOTE: All amounts entered into the "On Site Billable Hours" sections are automatically transferred to the Master Accounting Form.

c) For single trip, single air agency, the On Site Billable Hours section will be completed for each day of the inspection.

C. Multiple Sites/Individuals Visited. Inspectors traveling on a single trip to multiple air agencies and/or airmen are required to enter their travel costs and time into the Single Trip - Multiple Air Agency On-Site Accounting Form. This form automatically determines the proportional billing for each agency and/or individual inspected during the trip.

1) The team lead or principal inspector (PI) for a trip initiates the Single Trip - Multiple Air Agency On-Site Accounting Form and adds the agency designator and/or airman to that form.

NOTE: If there are more than four inspectors traveling together in support of an agency or airman, all inspectors will complete individual multiple site visits accounting forms to calculate their respective proportional charges for those agencies or individuals visited.

2) Once the Single Trip - Multiple Air Agency On-Site Accounting Form is initiated, the inspectors add their associated travel costs and the billable hours spent participating on the various work functions from their individual travel vouchers.

3) Once this form is complete, the cost information will be manually transferred to the appropriate airman- or air agency-specific Master Accounting Form.

4) The accounting form can support up to four traveling inspectors.

5) If both an individual airman and an air agency have received services, then select the "airman" radio button in the first section, and continue with the air agencies designators in the second section. Up to 12 entities can be included for 1 trip.

6) If the inspector has issued authorizations to several airmen, this form can take into account the entire number of airmen as bulk airmen and will proportionally divide the costs for each entity.

7) The amount shown in the line item for each airman and air agency represents the travel and subsistence cost, and will have to be manually transferred at this time to the airman and/or air agency Master Accounting forms.

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D. Preparation of Agency Billing. Agency billing will be accomplished by completing the Single Visit Air Agency Accounting Form for the agency and providing a letter with the totals broken out.

E. The Airman Master Accounting Form and the Air Agency Master Accounting Form. These forms will be used every time an airman or agency is charged by the FAA. By assuring all charges are logged into these two forms, management at the national level is able to assess what each office is collecting and what travel funds are being used, allowing for more accurate accounting in the future.

F. The Single Trip - Multiple Air Agency On-Site Accounting Form. This form is used for only one purpose. It allows the inspector to divide the expenses and time used proportionately between a multiple number of air agencies and airmen. Once this form is complete, all totals must be transcribed into one of the other two Master Accounting forms, as appropriate.

NOTE: Additional explanations and work instructions for completing these three forms will be found on the AFS-50 Part 187 Billing Activities SharePoint Site located at https://avssp.faa.gov/avs/afs50/187billing/SitePages/Home.aspx.

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Figure 12-17. Example Billing Letter for Air Agencies

[FAA Letterhead]

Mr. Accountable Manager
Repair Station Information
Address
City, County, Country
Postal Code

FAA Cert: ABCY123D

Dear Mr. _____,

The Federal Aviation Administration has completed an [add appropriate language here for work function completed (e.g., inspection of your repair station facility for the renewal of your Air Agency Certificate)].

The total charge for the renewal of the repair station approval came to exactly U.S. $9,983.22. This total corresponds to the following cost:

In Office Time	On Site Time	Travel Cost	Lodging/Meals	Other Exp.
$1,152.00	$3,456.00	$2,754.25	$2,515.74	$105.23

Please send payment in the form of a check, money order, or draft drawn on a U.S. bank and made payable to the Federal Aviation Administration.

We are also pleased to inform you that we now have the ability to accept payment by credit card. We accept MasterCard, Visa, Discover, and American Express. If you wish to make payment by credit card, please contact this office.

We recommend using Recorded Deliver for submission of your checks.

Until the payment is received, we will be unable to send the new certificate to you.

Yours Sincerely,

[Your name]
Principal Maintenance Inspector

Enc: Accounting Form

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Figure 12-17A. Example Billing Letter for Airmen/Designees

[FAA Letterhead]

Mr. Airman/Designee
Address
City, County, Country
Postal Code
FAA Cert/Desg #

Dear Mr. _____,

The Federal Aviation Administration has completed an [add appropriate language here for work function completed (e.g., renewal of your designation, testing authorization for inspection authorization)].

The total charge for these services and associated travel comes to exactly U.S. $1,409.22. This total corresponds to the following costs:

Fixed Cost	Travel Cost	Lodging/Meals	Other Exp.
3@$72 = $216.00	$749.28	$402.70	$41.24

Please send payment in the form of a check, money order, or draft drawn on a U.S. bank and made payable to the Federal Aviation Administration.

We also have the ability to accept payment by credit card. We accept MasterCard, Visa, Discover, and American Express. If you wish to make payment by credit card, please contact this office.

We recommend using Recorded Deliver for submission of your checks.

Until the payment is received, we will be unable to send the new certificate to you.

Yours sincerely,

[Your name]
Principal Maintenance Inspector

Enc: Accounting Form

RESERVED. Paragraphs 12-710 through 12-714.

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