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Flight Standardization Board (FSB) Report

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Manufacturer
Boeing

Type Certificate Data Sheet (TCDS)	TCDS Identifier	Marketing Name	Pilot Type Rating
A22WE	MD-10-10F	MD-10-10F	MD-11
A22WE	MD-10-30F	MD-10-30F	MD-11
A22WE	MD-11	MD-11	MD-11
A22WE	MD-11F	MD-11F	MD-11

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TABLE OF CONTENTS

RECORD OF REVISIONS

Revision Number	Section	Pages Affected	Date
Original	ALL	ALL	05/09/2000
1	Appendix 5	53	06/03/2009
2	Cover Page, Highlights of Change, Table of Contents, Record of Revisions, 1, 6–10, 12, Appendices 2–5	2, 3, 5, 6, 9, 10, 12–15, 18–23, 25–28, 30, 43, 44	08/07/2018

HIGHLIGHTS OF CHANGE

Revision 1:

The primary purpose of this revision is the addition of Appendix 5 that documents the training/checking/currency requirements for operations of Honeywell Head-Up Display (HUD) and Kollsman Enhanced Flight Vision System (EFVS).

Revision 2:

Updated Table of Contents, removed references to SFAR 58 and outdated Advisory Circulars, updated references to FAA Order 8900.1, removed references to outdated forms, removed outdated paragraphs 1.2.3; 7.3.5, Pictorial Preflight; 7.6, On-line Evaluations; 8.2, Methods for Re-Establishing Currency, removed unusable ODR tables in Appendix 2, Removed sample training program tables in Appendix 3, removed Compliance Checklist in Appendix 4, and modified Appendix 5 to reference current EFVS regulations.

ORIGINAL FSB COMPOSITION

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BACKGROUND

The MD-10 airplane is a major change to the DC-10 type design and is customized by Boeing Airplane Services (BAS), a division of The Boeing Company (Boeing), for a single operator, the Federal Express Corporation (FedEx). FedEx Management and Line Pilots were involved in the development and flight testing of the MD-10.

This modification applies new technology and essentially provides for MD-11 and MD-10 flightdeck commonality. This modification converts the DC-10 aircraft from three-crew to

two-crew operation. Crew workload studies were accomplished on the MD-11 and were accomplished for the MD-10 differences. The flight controls, control systems, flap/slat handle, and engines of the DC-10 remain unchanged. The MD-10 flightdeck systems replicate many of the MD-11 systems including:

- An Electronic Instrument System (EIS).
- An MD-11 type Autoflight System.
- Automatic System Controllers (excluding the Air System).

The Transport Aircraft Long Beach Branch was requested by Boeing to determine training and type rating requirements using the methods outlined in Advisory Circular (AC) 120-53, Crew Qualification and Pilot Type Rating Requirements for Transport Category Aircraft Operated under FAR Part 121. A T-2 test (Handling Qualities Comparison), as outlined in AC 120-53, was conducted to evaluate the effect of the MD-11 Flight Control Computer (FCC) software load 908 in eliminating handling differences with the MD-10 during takeoff and landing phase of flight. A T-3 test was conducted to evaluate system differences and validate proposed training and checking. The only training program evaluated was receiving initial and transition training and type rating in the MD-11 with Differences Training to the MD-10, as requested by Boeing and FedEx. Adequate training devices were not available to conduct evaluations of MD-10 initial or transition training and may be evaluated at a later date.

1 PURPOSE AND APPLICABILITY

1.1 This Flight Standardization Board (FSB) report specifies Federal Aviation Administration (FAA) master training, checking, and currency requirements applicable to crews operating MD-10 and MD-11 aircraft under Title 14 of the Code of Federal Regulations (14 CFR) part 121. This report also addresses certain issues regarding the operation of MD-10 and MD-11 aircraft other than under part 121 (e.g., type rating determination, training). Provisions of this report include:

1.1.1 Pilot Type Rating Requirements.

1.1.2 Describing Master Common Requirements (MCR) applicable to MD-10s and MD-11s.

1.1.3 Describing Master Difference Requirements (MDR) for crews requiring differences qualification for mixed fleet flying or transition of MD-10 variants, MD-11 variants, or both MD-10 and MD-11 variants.

1.1.4 Providing examples of acceptable Operator Difference Requirements (ODR) Tables.

1.1.5 Describing an acceptable training program and training device characteristics when necessary to establish compliance with pertinent MDRs.

1.1.6 Setting checking and currency standards, including specification of particular check items that must be administered by the FAA or operators.

1.1.7 Providing information to FAA field offices about MD-10 and MD-11 compliance with 14 CFRs, ACs, or other operational criteria.

1.2 This report provides.

1.2.1 Minimum requirements which must be applied by FAA field offices (e.g. MCRs, MDRs, type rating designations).

1.2.2 Information which is advisory in nature but may be mandatory for particular operators if the designated configurations apply and if approved for that operator (e.g., MDR footnotes, acceptable ODR tables).

1.3 This report addresses MD-10 variants, including MD-10-10F, -30F, and MD-11 variants, including the MD-11 and MD-11F. Refer to FAA Type Certificate Data Sheet (TCDS) #A22WE.

1.4 The provisions of this report are effective until amended, superseded, or withdrawn by subsequent revisions to this FSB report.

1.5 Terminology.

The term "must" is used in this report and certain MDR footnotes even though it is recognized that this FSB report, and the current edition of AC 120-53, Guidance for Conducting and Use of Flight Standardization Board Evaluations, on which it is based, provides one acceptable means, but not necessarily the only means, of compliance with part 121 subparts N and O requirements. This terminology acknowledges the need for operators to fully comply with this FSB report MDR and ODR provisions if AC 120-53 is to be used by the operator as the means of complying with part 121. Operators who choose this method must comply with each applicable MDR provision, including the footnotes.

1.6 Acronyms.

The following is a list of some of the acronyms used in this report:

14 CFR	Title 14 of the Code of Federal Regulations
AD	Airworthiness Directive
AFM	Airplane Flight Manual
AGL	Above Ground Level
APD	Aircrew Program Designee
APM	Aircrew Program Manager
APPR	Approach
AQP	Advanced Qualification Program
ASI	Aviation Safety Inspector
ATP	Airline Transport Pilot
CAWS	Central Aural Warning System
CBT	Computer-Based Training
CG	Center of Gravity
Combi	Combination Passenger/Cargo
CWS	Control Wheel Steering
DU	Display Unit
EAD	Engine and Alert Display
EFVS	Enhanced Flight Vision System
EIS	Entry Into Service
FAA	Federal Aviation Administration
FADEC	Full-Authority Digital Electronic Control
FCC	Flight Control Computer
FCP	Flight Control Panel

FedEx	Federal Express
FF	Fuel Flow
FMA	Flight Mode Annunciator
FMC	Flight Management Computer
FMS	Flight Management System
FPA	Flight Path Angle
FQ	Fuel Quantity
FSB	Flight Standardization Board
FTD	Flight Training Device
GS	Glideslope
IRS	Inertial Reference System
JAA	Joint Airworthiness Authority
LOC	Localizer
LOFT	Line-Oriented Flight Training
LSAS	Longitudinal Stability Augmentation System
MDA	Minimum Descent Altitude
ND	Navigation Display
NSP	National Simulator Program
ODR	Operator Difference Requirements
PDCS	Performance Data Computer System
PFD	Pilot Flight Display
PM	Pilot Monitoring
PMS	Performance Management System
POI	Principal Operations Inspector
PROF	Profile Mode
RCWS	Roll Control Wheel Steering
RTO	Rejected Takeoff
SD	System Display

2 PILOT TYPE RATING REQUIREMENTS

In accordance with the provisions of 14 CFR parts 1 and 61, the same “type ratings” are assigned to the MD-10 and MD-11. Any MD-10 variant is designated as an “MD-11”, and any MD-11 variant is designated as a “MD-11”. Initial or transition training and type rating must be accomplished in the MD-11 before MD-10 difference training, as outlined in Appendix 1, Master Difference Requirements; Appendix 2, Example of Acceptable ODR Tables; and Appendix 3, An Acceptable MD-10/MD 11 Training Program.

3 MASTER COMMON REQUIREMENTS (MCR)

3.1 Minimum Altitude for Use of Autopilot (14 CFR Part 121, § 121.579).

For the MD-10 and MD-11, unless a higher value is otherwise specified by the FAA (e.g. by Airplane Flight Manual (AFM), Airworthiness Directive (AD), Service Bulletin), the minimum altitude for engagement of the autopilot for MD-10 and MD-11 aircraft, under part 121 operations, is 200 feet above ground level (AGL) in “takeoff”, “level change”, “vertical speed”, and “altitude hold” mode. “PROF” mode may be used in accordance with AFM constraints for minimum engagement altitude.

For autopilot precision approach, dual land, single land, or go-around, autopilot minimum use height is as specified by the AFM for the respective mode (i.e., autopilot may usually remain engaged through completion of landing rollout). For non-precision approach, the autopilot minimum use altitude is 50 feet below published minimum descent altitude (MDA) when using “level change”, “vertical speed”, “flight path angle (FPA)”, or “altitude hold” modes.

3.2 Approach Categories (14 CFR Part 97, § 97.3).

The MD-10 and MD-11 are considered Category D aircraft for “straight-in approach” weather minima. Certain MD-10-10s may be considered Category C if, at their maximum certificated landing weight, 1.3 V_{SO} is less than 141 knots (see the pertinent AFM and § 97.3(b)). The MD-10 and MD-11 are considered approach Category D aircraft for “circling approach” weather minima unless otherwise permitted or required by applicable operations specifications (OpSpecs).

3.3 No-Flap Approach.

Training and checking requirements include:

3.3.1 Training for and demonstration of approaches with no slats and normal flaps, no flaps and normal slats, and no slats or flaps is appropriate for the MD-10 and MD-11 aircraft. Training for go-around flap differences is appropriate. (i.e., MD-10 is 22° and MD-11 is 28°).

3.3.2 Credit for demonstration of a “no-flap/no-slat” approach in either a MD-10 or MD-11 aircraft is permitted for the other respective type if approved by the principal operations inspector (POI).

3.4 Normal “Final Landing Flap Setting”.

The normal “final landing flap setting” is considered to be either “flaps 35” or “flaps 50” for both MD-10 and MD-11.

3.5 MD-10 and MD-11 Common Landing Credit.

The MD-11 must have FCC software load 908 or later to receive landing credit or 90-day landing currency is required. The FCC software load 908 package for the MD-11 improves landing qualities and enhances tail strike prevention. These handling quality improvements are transparent to the crew.

3.6 Use of MD-10 and MD-11 “MAP” Mode During Instrument Approaches.

It is appropriate that crews monitor pertinent raw data navigation information during instrument approaches using the navigation display (ND) “MAP” mode. Raw data localizer (LOC) and glideslope (GS) information on the primary flight display (PFD), and very high frequency omni-directional range (VOR), or Nondirectional Radio Beacon (NDB) information on the ND, should be monitored to ensure consistency with ND map information. Some operators consider it good operating practice to have one pilot monitor the pertinent ND “APPR” or “VOR” display mode to validate information shown by the map display. Exclusive use of the “MAP” mode by both pilots during an instrument approach without some means of crosscheck (i.e., monitoring PFD LOC and GS data), is not appropriate. This is due to the potential for error associated with unreliable navigation signals, delays in

updating following “IRS only” operations, flight management system (FMS) map drift, facility outages, or other such factors.

4 MASTER DIFFERENCE REQUIREMENTS (MDR)

4.1 MDR Tables.

Requirements for particular MD-10 and MD-11 variants are shown in Appendix 1. These provisions apply when differences between variants exist which affect crew knowledge, skills, or abilities (e.g., Level A or greater differences). Credit for certain maneuvers is permitted between MD-10 and MD-11 aircraft, as specified. This is appropriate since similar handling qualities and other common characteristics, such as cockpit visibility, may permit certain credit for training, checking, and currency (e.g., stalls and steep turns).

4.2 MDR Footnotes.

Footnotes to MDR requirements define acceptable “required means” of compliance. A footnote can indicate requirements that are less restrictive than the basic designation, or more restrictive than the basic designation, depending on the significance of the differences between particular variants.

4.3 Difference Level Definitions.

Difference level definitions are as specified in AC 120-53. For convenience, a table summarizing these definitions is included with the MDR table in Appendix 1.

5 FAA-APPROVED OPERATOR DIFFERENCE REQUIREMENTS (ODR) TABLES

5.1 ODR Tables.

ODR tables are to be developed by each individual operator when differences exist which affect crew qualification. An example ODR table related to MD-10 and MD-11 mixed fleet operations is shown in Appendix 2. This ODR table is provided only as an example and may not include items that are applicable to particular operators.

5.2 Landing Currency Credit Permitted by ODR Tables.

Credit for takeoff and landing maneuvers are permitted between MD-10 and MD-11 aircraft as specified in ODR tables. When approved by the FAA, an operator may have its pilots satisfy the requirement for three takeoffs and landings in the previous 90 days (§ 121.439) by accomplishing those takeoffs and landings in either the MD-10, the MD-11, or by any combination of three takeoffs and landings in an MD-10 or MD-11. The MD-11 must have FCC software load 908 or later to receive this credit.

5.3 Distribution of FAA-Approved ODR Tables.

Distribution of the FAA-approved ODR tables should be as follows:

5.3.1 Original FAA-approved ODR tables are to be retained by the operator.

5.3.2 Copies of FAA-approved ODR tables are to be retained by the responsible Flight Standards office.

5.3.3 A copy of approved ODR tables should be provided to the MD-10 and MD-11 FSB Chair, Transport Aircraft Long Beach Branch.

6 FSB SPECIFICATIONS FOR TRAINING

6.1 General.

6.1.1 Airmen Experience.

The provisions of this section of the report apply to programs for experienced airmen (i.e., airmen who have previous experience in part 121 air carrier operations, former military, commuter or corporate pilots with turbine powered aircraft experience). For airmen not having such experience, additional requirements may be necessary as determined by the POI, FSB, and the Air Transportation Division.

6.1.2 MD-10 and MD-11 Training Programs with Differences Between Aircraft.

When more than one variant of MD-10, MD-11, or combinations of MD-10s and MD-11s are flown in a mixed fleet, differences training programs meeting criteria specified by MDR tables must be described in ODR tables and approved by the FAA. The only training program evaluated was receiving initial and transition training in the MD-11 with differences training to the MD-10.

Any existing MD-10 program that is less comprehensive than the program shown in Appendix 2 should be reviewed and revised as necessary to meet MDRs. Any changes proposed to such existing programs making those programs less restrictive should not be approved without prior coordination with the MD-10 and MD-11 FSB Chair.

6.1.3 Takeoff Safety.

Because of frequent MD-10 and MD-11 operations at critical weight with runway limited takeoffs, particular emphasis on certain takeoff safety related topics is appropriate during training. This includes emphasis on the following:

a) The meaning and proper use of V_1.

b) The importance of prompt and correct execution of a rejected takeoff (RTO), including the difference in brakes, aircraft with and without autobrakes, and use of full braking capability.

c) The need to minimize exposure to high-speed RTOs for minor difficulties unrelated to the ability of the aircraft to continue a safe takeoff.

d) Proper selection of flap settings and thrust levels for existing conditions and the need to set power before 80 knots.

e) Proper lineup and use of available runway.

f) Correct accountability for contaminated runway and/or reduced braking friction.

g) Consideration of use of reduced V_1 or minimum V_1 when runway in excess of critical field length is available.

h) Flap/slat handle differences.

6.1.4 MD-10 and MD-11 Altitude Callouts During Landing.

Radar Altimeter (RA) callouts have been found to be beneficial during flare. Accordingly, for those MD-10 and MD-11 aircraft not equipped with automatic voice radar altitude callouts or tones, a crew procedure providing for a "pilot monitoring" (PM) flightcrew member to make callouts during flare is recommended (e.g., callouts for 50 feet, 30 feet, 10 feet radar altitude).

For the MD-10 and MD-11, due to the minimum number of landings typically accomplished by each crewmember as a result of long stage lengths, and the need for the PM to monitor other parameters during flare, use of automatic voice callouts (if installed) during flare is certified and appropriate. The procedures of MD-10 and MD-11 operators not electing to use automatic callouts should only be approved if use of an equivalent or better procedure or method is demonstrated.

6.1.5 Automatic Landings.

If an operator conducts automatic landings in either the MD-10 or MD-11, then appropriate training must occur. This training must be conducted in the MD-10 or MD-11 training device and/or simulator or airplane.

However, due to the similarity between autoland systems in the MD-10 and MD-11, autoland training may occur in any MD-10 or MD-11 variant.

6.1.6 Hazardous Weather and Winter Operations.

Proper precautions and procedures regarding hazardous weather/winter operations which may be unique to MD-10 and MD-11 aircraft should be addressed. For example, topics such as proper use of wing/(MD-11 tail) anti-ice, antiskid braking characteristics when stopping on slippery runways, appropriate autobrake settings or lack of autobrake, hazards associated with rejecting critical weight takeoffs near V_1 on slippery runways, and other such topics are appropriate for emphasis in training programs due to the significant percentage of critical field length takeoffs.

6.1.7 Crewmember Emergency Training (§ 121.417).

Appropriate emergency training must be given to each crewmember on the location, function, and operation of each item of emergency equipment that is different in each MD-10 and MD-11 variant. Training may be accomplished by pictures or videotape if, prior to line operation, adequate knowledge of equipment use is demonstrated to an authorized representative of the operator for that variant in a static aircraft or approved training device.

a) Where equipment is common, instruction may be adjusted for those crewmembers qualified and current on other MD-10 and MD-11 variants provided records required by § 121.683(a) show that crewmembers meet §§ 121.417 and 121.683(a)

requirements. For example, where elements of interior configurations are common, training may be simultaneously credited for variants.

b) For different emergency equipment, doors, slides, slide/rafts, rafts, communications, or other interior configuration elements, even when within the same series (e.g., MD-10-10 and -30), training on emergency equipment for each variant is required in accordance with MDRs.

6.1.8 MD-10 and MD-11 Special Characteristics.

a) Critical Hydraulic Failure:

All MD-10 and MD-11 aircraft have the #3 hydraulic system modification, which permits limited control in the event of catastrophic tail section hydraulic failure. Crews must demonstrate familiarity with pertinent hydraulic system annunciations and knowledge of backup aircraft control and thrust management for such a hydraulic failure. An approach and landing should be accomplished with this critical hydraulic failure during initial, transition, and upgrade training. For crews currently qualified on one or both of these aircraft, if not already addressed, this issue should be addressed during a suitable recurrent training period on at least a one-time basis. While demonstration of use of proper procedures and control in this configuration is appropriate, it is not an objective to train to proficiency in landing with this configuration.

b) Takeoff Rotation With Failure of #2 Engine.

Due to the location of the #2 engine, in the event of failure of the #2 engine, a pilot will experience very light control forces at rotation. Pilots should be familiar with this characteristic and take precautions not to “prematurely rotate”, “over rotate”, or let speed subsequently decay below V_2 during initial climb.

c) MD-11 High Altitude Training.

Training in high altitude pilot induced oscillation (PIO) and upsets should be accomplished in the simulator. If inadvertently encountering speeds beyond V_{MO}/M_{MO}, the MD-11 Longitudinal Stability Augmentation System (LSAS) speed protection feature may in some instances provide pitch control feedback that can lead to slight PIO during recovery. Crews should be aware of this characteristic and be advised that use of normal overspeed recovery techniques, including thrust reduction and a smooth increase of pitch attitude, are appropriate. The MD-11, due to engine performance, is able to operate at an altitude where the margin is reduced between high-speed and low-speed stalls. Also, the MD-11 during cruise uses tail fuel management to maintain an aft center of gravity (CG) near the limit for fuel efficiency. A high altitude training program and the aero data needed to upgrade the MD-11 training simulators is available from Boeing and should be incorporated into the operator’s training program.

d) Rotation, Flare, and Geometry Limits.

Due to fuselage geometry, crews must be clearly aware of the attitude at which tail contact can occur, proper rotation and flare technique, and flare and touchdown pitch characteristics of the aircraft with use of various flap, spoiler, reverse thrust, and CG

conditions. This should be addressed for normal takeoffs and landings, with a wing or center engine inoperative, and for landing considering use of either auto spoilers or manual spoilers. Emphasis on MD-11 fuselage length should be addressed.

e) Automatic System Controllers (ASC).

The MD-11 has four ASCs and the MD-10 has three, with the air controller being manual only. Training must include dispatching with controllers in manual, especially the fuel system controller.

f) Full-Authority Digital Electronic Control (FADEC) versus Non-FADEC Engines.

Training must include differences between FADEC and non-FADEC engines, setting takeoff and go-around thrust, autothrottle differences, and emphasis on preventing overboost with both engine types.

6.1.9 Training for MD-10 and MD-11 "Seat Dependent" Tasks.

a) The MD-10 and MD-11 tasks, procedures, or maneuvers which are considered to have seat dependent elements are as follows:

1) Use of steering tiller during taxi.
2) RTO.

b) Other items which could in certain circumstances have seat dependent elements, and may need to be considered and addressed as determined by each operator and POI on a case-by-case basis, include the following:

1) Crosswind takeoffs and landings.
2) Engine inoperative takeoffs and landings.
3) Emergency communications.
4) Loss of all generators.
5) Loss of all engines.
6) Emergency descent.
7) Operation on emergency power (display unit (DU) display configuration differences).

6.2 Initial, Upgrade, and Transition Training.

6.2.1 Pilot Initial, Upgrade, and Transition Ground Training (§ 121.419).

Pilot initial, upgrade, and transition ground training is accomplished in accordance with § 121.419 or an Advanced Qualification Program (AQP) and must be accomplished on the MD-11. When more than one variant is to be flown or transition from one variant to another is to be accomplished, appropriate ground instruction in differences is required for each variant consistent with MDR provisions.

6.2.2 Pilot Initial, Upgrade, and Transition Flight Training (§ 121.424).

Pilot initial, upgrade, and transition flight training is accomplished in accordance with § 121.424 or an AQP and must be accomplished on the MD-11. When flight training is accomplished, and several variants are to be flown, flight training is to suitably address each variant consistent with MDR provisions.

6.2.3 Training Program Hour Reductions (§ 121.405).

Training program hours may be reduced as specified in § 121.405, but may not be reduced to a level which is less than that set forth in the example of an acceptable MD-11 training program.

6.3 Differences Training (§ 121.418).

6.3.1 General.

Initial or transition training program is completed for each MD-11 variant and differences training is necessary for each MD-10 variant as shown in the example of an acceptable MD-10 differences training program.

Samples of acceptable ODR tables for differences are shown in Appendix 2.

a) The differences training program in Appendix 2, for mixed fleet flying, assumes a trainee has completed initial, upgrade, or transition training in the MD-11 and will receive differences training for the MD-10 variant group(s).

b) Coverage of differences may be completed coincident either with each phase of initial, upgrade, or transition training, or following completion of that training.

6.3.2 Differences Ground Training.

Differences ground training on the topics applicable to the pertinent variant group or groups and shown by sample ODR tables and as shown in the example of an acceptable MD-10 differences training program is required.

6.3.3 Differences Flight Training.

Differences flight training is required in the topics and maneuvers applicable to the pertinent variant group or groups that are shown by sample ODR tables and as shown in the example of an acceptable MD-10 differences training program. For an AQP, “Flight Qualification Events” must be consistent with items specified by the applicable ODR tables.

6.3.4 Engine Intermix.

Engine intermix operations (i.e., For the MD-10, different Pratt & Whitney (PW) JT9Ds or different General Electric (GE) CF6s with different levels of rated thrust, or for the MD-11, different PW4460s) are acceptable as specified by the AFM. If engine intermix limits and performance are clearly addressed (V_{MCG}, airport analysis, § 121.189 obstacle clearance, etc.), and this information is readily available to the flightcrew and easily interpreted, then differences in the ODR tables are considered acceptable.

6.3.5 Passenger and Freighter Variants.

Mixed flying of passenger, combi, and freighter variants within the same variant group (i.e., MD-10-10 passenger and freighter configurations, or MD-11 passenger and combi) may require compliance with additional MDR footnote limitations and ODR tables. This is appropriate due to differences in doors, fire protection provisions, emergency evacuation, and other areas.

6.4 Recurrent Training.

6.4.1 Recurrent training must include appropriate training in accordance with § 121.427 for each variant group consistent with the items and levels specified by MDR and ODR tables for differences training.

6.4.2 Recurrent flight training requires appropriate maneuvers and procedures identified in part 121 appendix F or AQP-approved flight training programs. For either case, maneuvers and procedures addressed must account for each variant group operated. ODR table provisions identify differences in maneuvers or procedures between variants which must be addressed in the operators recurrent program.

6.5 Line-Oriented Flight Training (LOFT) Programs (§ 121.409(b)(2)(ii).

When operators have LOFT programs and several variants, POIs should review LOFT credits to assure suitability for each variant. If simulators used for LOFT have differences from the variants actually flown, LOFT credits may be reduced or eliminated if such differences are determined to have a significant adverse effect on the effectiveness of LOFT. LOFT credit between MD-10 and MD-11 programs are acceptable.

6.6 Other Training.

6.6.1 Designated Firefighter (Combi Only).

Prior to part 121 use of MD-10 and MD-11 “Combi” variants in service, POIs should coordinate with the FSB on the use of the “Designated Firefighter” training requirements (i.e., the “Combi Standards for Training”) mandated by the “Combi AD-93-07-15”, and agreed to by the FAA, Transport Canada, and the Joint Airworthiness Authority (JAA).

6.6.2 Flight Attendants.

Due to similarities in cabin configuration, flight attendants may be jointly qualified in all MD-10 and MD-11 variants. Such qualification, however, must address any differences in doors, slides, communications, and emergency equipment when common qualification applies.

6.6.3 Aircraft Dispatchers.

POIs assure that operators have complied with § 121.422 (aircraft dispatcher training) for all variants as follows:

Dispatchers may be simultaneously qualified for all MD-10 and MD-11 variants. However, for variants which have different performance, procedures, or limitations (i.e., use “Flex” thrust ratings, Master Minimum Equipment List (MMEL), Category (CAT) III, Engine Intermix, or other such differences), dispatchers must be trained to suitably address those differences. Records should indicate the variants for which dispatchers are qualified.

7 FSB SPECIFICATIONS FOR CHECKING

7.1 General.

7.1.1 MD-10 and MD-11 Checks/Evaluations.

Checks or evaluations specified by parts 61 or 121 appendix F or AQP evaluations apply to MD-10 and MD-11 variants as permitted by MDRs and ODRs. Part 121 differences checking items within each of the MD-10 and MD-11 types are accomplished as specified by MDRs and ODRs.

7.1.2 The following areas of emphasis should be addressed during checks as necessary.

a) Manual and automatic flight.

Proficiency with both manual and automatic flight in normal and non-normal situations, including the use of appropriate flight guidance system (FGS) modes.

b) Unique features.

Proper use or understanding of features not commonly found on other transport aircraft (e.g., “Dial-a-Flap”, auto slat extend, center landing gear) and MD-10 flap/slat handle.

c) Unique flight characteristics.

Proper response to flight characteristics which may be different from other transport aircraft (i.e., proper pitch and lateral control following an engine failure during takeoff, particularly the number #2 engine); proper use of reverse thrust (particularly with an inoperative engine or reverser); suitable planning for and performance of a two engine inoperative landing; and proper taxi technique, such as during turns between narrow taxiways.

d) Other characteristics.

Timely and correct response to situations that could be experienced with extended range/heavy weight aircraft, such as demonstrating prompt and correct performance of RTOs on critical length runways; maintaining awareness of brake energy and brake temperatures following landings with short turnaround times, (i.e., MD-10 steel brakes versus MD-11 carbon brakes following RTOs or during extended taxi); timely identification of the need for and initiation of fuel dumping; proper enroute fuel monitoring and management on extended range flights; proper performance of extended range/overwater navigation procedures (if applicable); and proper method of disconnecting autopilot (i.e., never apply force to control wheel or column).

7.2 Maneuvers/Procedures.

7.2.1 FMS/Global Positioning System (GPS) Demonstration of Competency.

a) FMS/GPS checking for the MD-10 and MD-11 should include a demonstration of both normal and non-normal procedures as necessary. Training and checking for clearances not normally given by air traffic control (ATC) should be discouraged

for initial and transition training because it detracts from training in more critical areas. Specific items and flight phases to be checked include any applicable initialization, takeoff, departure, cruise, arrival, precision and non-precision approach, missed approach, holding, diversion to an alternate or route change, and pertinent non-normals.

b) For extended range over remote areas or oceanic operations, FMS/GPS use may include emphasis on items such as proper step climb considering enroute winds, engine-out diversion planning, and fuel management.

c) Since navigation must be accomplished through use of the FMS/GPS, a high degree of proficiency with basic FMS/GPS features should be exhibited to initialize or find necessary information to safely accomplish a flight, to properly configure the aircraft (confirm V-speeds, adjust thrust limits, set CG, etc.), and to satisfy commonly accepted ATC clearances without undue delay. However, it is recognized that demonstration of mastery of each and every feature of FMS/GPS, use of the full range of alternative techniques, use of the optimum technique for a particular task, or use of extra/optional features and other such "mastery level" skills common to experienced FMS/GPS users may not necessarily be mature at the time of initial certification of an applicant. The key factor to be evaluated is whether the applicant can safely, confidently, and expeditiously use the FMS/GPS to achieve the desired outcome and assure safe flight without undue errors, delays, distractions, or unsafe results.

d) Proper use of "standby navigation" mode should be demonstrated because use of standby navigation is not normally used in line operations.

e) Proper FMS/GPS use in conjunction with outside visual traffic scan, particularly in terminal areas, should be demonstrated. Prolonged fixation on FMS significantly detracting from outside scan should be avoided.

7.2.2 "No-Flap/No-Slat" Approaches.

Checking regarding "no-flap/slat" approaches for the MD-10 and MD-11 is conducted in accordance with the provisions of paragraph 3.3. "No-flap/no-slat" and "hydraulic system abnormal" approaches may be combined or addressed during training related to demonstration of the #3 hydraulic system enhancements.

7.2.3 MD-10 and MD-11 Specific Items.

a) Checklists.

Non-normal checklists supplied by the manufacturer are organized using a different method than commonly used for other transport aircraft and part 121 operators; however, the sequence of the manufacturers checklist actions must not be changed. Thus, applicants should clearly demonstrate the ability to find pertinent items and accurately use MD-10 and MD-11 non-normal checklists in a timely manner, including use and understanding of related synoptic displays and any associated "consequences" messages. It should be noted that the "consequences" display is not an approved means to substitute for the abnormal or emergency checklist requirements of § 121.315.

b) Automatic Flight System.

Crews should have a clear understanding of Flight Control Panel (FCP) use, including confirmation of mode arming and engagement and use of Flight Mode Annunciations (FMA) on the PFD. Crews should be sufficiently familiar with the FCP and FMA to easily and reliably satisfy routine flight path control requirements, comply with typical ATC clearances, and respond to non-normal situations such as engine failure or emergency descent. Crews should not show confusion about which modes are armed or active or how to select the mode desired. Crews should exhibit confidence in actions to take to accomplish a particular maneuver, not be surprised by the aircraft accomplishing a different maneuver than expected, or failing to respond as intended. If the “speed protection” mode, “windshear” mode, or other such situations are encountered, an appropriate crew response should be evident. Crews should be trained to immediately take manual control of the airplane if FCP or FMA confusion occurs.

c) Engine and Alert Display (EAD) and Systems Displays (SD).

Proper use of EAD and SDs should be demonstrated in conjunction with both normal and non-normal procedures. It should be evident that critical information (total fuel, stabilizer position, bleed air pressure for start, etc.) can be easily found when necessary, even for situations in which a display unit (DU) may be inoperative.

d) Central Aural Warning System (CAWS).

Pilots should be sufficiently familiar with aural alert messages and be able to readily distinguish between those messages requiring awareness, attention, or action from messages that do not. For example, some messages are the result of a configuration that the crew is otherwise already aware of, some may result from a known inoperative component (minimum equipment list (MEL) item), and some may be considered advisory only.

e) Communication Radio Management.

Clear understanding of the use of communication radio panels and audio control panels should be demonstrated. Flight training device (FTD) and simulator training sessions should incorporate simulated ATC or company radio communications by using the simulator/FTD speakers or headsets. A clear understanding of the use of passenger address (PA), oxygen mask mic, very high frequency (VHF) #1 radio, and cabin interphone for emergency communications should be evident.

f) Fuel System.

Because of the criticality of fuel computations during extended range/overwater flights, crews should be particularly familiar with the way fuel computations are made by the flight management computer (FMC), in addition to basic fuel quantity indications on the overhead panel and use of the fuel synoptic. The importance of issues, such as entering enroute wind data into the FMC to get a proper destination fuel estimate, the effect of using fuel flow (FF) alone as the basis for FMC calculation of extra fuel rather than the normal “fuel flow plus fuel quantity” (FF+FQ), and proper use of ballast fuel, should be clearly understood.

Training and checking with fuel system in manual, especially if MEL dispatch with auto fuel system controller inoperative is planned.

7.3 Type Ratings.

7.3.1 Oral Exam.

For an MD-11 type rating, the oral portion of a type rating practical test must address the MD-11 aircraft. If the MD-10 is to be flown, differences may be addressed by a check airman, Training Center Evaluator (TCE), instructor, or FAA inspector.

7.3.2 Pilot Seat to be Used.

The practical test for MD-11 airline transport pilot (ATP) or type rating may be demonstrated from either pilot seat with the exception of taxiing tasks, which must be demonstrated from the left pilot seat.

7.3.3 Variant to be Used.

Airmen may complete the necessary practical test in any MD-11 variant for issuance of an "MD-11" pilot type rating, with differences training to any MD-10 variant.

7.3.4 Differences.

Before airmen serve in a variant other than that in which a type rating practical test was completed, differences qualification in accordance with MDR and ODR provisions must be completed.

7.3.5 Airmen Not Employed Under Part 121.

A practical test for an applicant intending to operate under 14 CFR parts 91 or 125 should be conducted in a variant of the same group as that intended to be flown. Where an MD-11 type rating is sought, the test must be conducted using any MD-11 variant, with differences to any MD-10 variant, if the MD-10 is to be flown. The inspector should recommend that at least one of the following provisions be met prior to serving as pilot in command (PIC) of a different variant than the one in which the original test was accomplished.

a) Completion of differences qualification in accordance with or equivalent to that specified for part 121 (e.g., compliance with MDRs and ODRs).

b) Completion of a proficiency check in accordance with part 61, § 61.58 completed in the variant(s) to be flown.

c) Completion of a proficiency check in accordance with or equivalent to that specified by part 121, a check conducted by a US military service, or other equivalent check in an aircraft of the variant group to be flown.

d) Completion of a briefing by the evaluator or inspector to an applicant regarding the desirability of additional differences training prior to flying other MD-10 or MD-11 variants.

7.4 Proficiency Checks/Evaluations.

7.4.1 MD-10 and MD-11 Proficiency Checks.

Except as specified in approved ODR tables, proficiency checks/evaluations may be administered in any MD-10 and MD-11 variant group.

7.4.2 Proficiency Checks Addressing Each Variant Flown.

When a proficiency check/evaluation addresses qualification in more than one variant, the check may primarily address one variant. However, portions of the check should be accomplished in relevant combinations of training devices, simulators, or aircraft to ensure assessment of competency related to other variant(s) flown.

7.4.3 Substitution of Recurrent Flight Training.

Satisfactory completion of a proficiency check may be substituted for recurrent flight training as permitted in § 121.433(c) for either the respective MD-10 or MD-11 types.

7.4.4 Alternating Proficiency Checks.

If crews fly MD-10 and MD-11 variants in a mixed fleet, it is desirable, but not mandatory, for proficiency checks to alternate each 6 months for PICs, and annually for First Officers (F/O), unless otherwise authorized by the FAA (i.e., through an exemption which permits annual training/checking in lieu of each 6 months). When alternating checks are accomplished, the differences assessment for other respective MD-10 or MD-11 variants being evaluated may be satisfied by ground training, written questionnaire, oral review, or other method approved by the POI.

7.4.5 Section 61.58 Checks.

Proficiency checks, which may be required in accordance with § 61.58 but do not pertain to part 121 operations, should be administered using the same variant or a variant within the same group as the aircraft intended to be flown unless otherwise authorized by the FAA.

7.5 Use of FTDs for Certain Check/Evaluation Items.

MD-10 and MD-11 FTDs may be used for certain additional check items for the ATP, type rating, proficiency check, or proficiency evaluation. Devices or simulators are approved by the operators' POIs, consistent with National Simulator Program (NSP) qualification and FSB master requirements.(see paragraph 10.2.4).

7.6 Operating Experience (OE) (§ 121.434, AC 120-53).

The same OE applies to the MD-10 and MD-11. OE for the MD-10 and MD-11 may be accomplished in any MD-10 and MD-11 variant provided MD-11 FCC software load 908 or later is installed. It is recommended that OE be accomplished in the MD-11. If MD-11 FCC software load 908 or later is not installed, OE is required for both MD-10 and MD-11.

7.7 Qualifications of FAA Inspectors, Evaluators, or Check Airmen.

For the purpose of airman certification, FAA inspectors, aircrew program designees (APD), evaluators, or check airmen should have completed appropriate qualification for the respective MD-10 or MD-11 variant(s) to be flown.

8 FSB SPECIFICATIONS FOR CURRENCY

8.1 Currency (Recent Experience) § 121.439.

8.1.1 Currency required by § 121.439 is addressed for the MD-10 and MD-11 in the approved ODR tables. For programs approved through ODR tables, currency is specified in accordance with MDRs.

8.1.2 Currency Credit.

Currency between MD-10 and MD-11 variant groups is permitted as shown by approved ODR tables. This is appropriate because handling characteristics of all MD-10s and MD-11s are common, provided MD-11 FCC software load 908 or later software is installed in the MD-11; if FCC software load 908 is not installed, 90-day landing currency is required.

Takeoffs and landings performed in one variant are equivalent to those performed in other variants if knowledge and procedural issues are suitably addressed through appropriate ODR table provisions.

9 OPERATIONAL COMPLIANCE CHECKLIST

9.1 General.

Compliance checklists are provided as an aid to Flight Standards offices in identifying those specific rules or policies for which compliance has already been demonstrated to the FAA for a particular aircraft type, variant, or variant group. The checklist also notes rules or policies which remain to be demonstrated to the responsible Flight Standards office by operators.

9.2 MD-10 and MD-11 Compliance Checklist.

An MD-10 and MD-11 compliance checklist is provided in Appendix 4, Aircraft Compliance Checklist. Compliance was determined by inspection of and for only the first production completed airplane. Compliance for the MD-10 was determined on the freighter variant only.

9.3 Discussion of Specific Compliance Items.

9.3.1 Emergency Evacuation - MD-10.

An emergency evacuation demonstration in accordance with § 121.291 was successfully completed for the DC-10, including configurations, flight attendants, and passenger capacities listed on TCDS #A22WE. Maximum passenger capacity is 380. This also applies to the MD-10; however, a partial emergency evacuation demonstration is required for each new passenger MD-10 operator.

9.3.2 Emergency Evacuation - MD-11.

An emergency evacuation demonstration in accordance with § 121.291 was successfully completed for the MD-11, including configurations, flight attendants, and passenger capacities listed on TCDS #A22WE. Maximum passenger capacity is 410. A partial emergency evacuation demonstration, however, is required for each new MD-11 operator.

9.3.3 Section 121.291 Ditching Demonstration - MD-10.

Due to the similarity of doors, slides/rafts, and procedures, credit for a DC-10 full scale ditching demonstration is permitted for the MD-10. Accordingly, use of a "partial ditching demonstration" is permitted for the MD-10 in accordance with Order 8900.1, Volume 3, Chapter 30, Section 6.

9.3.4 Proving Tests, § 121.163.

a) MD-10.

Proving tests in accordance with § 121.163(c) are appropriate in accordance with Order 8900.1, Volume 3, Chapter 29, Section 3. Credit in the form of proving test time reductions may be given for previous DC-10 and MD-11 experience for that operator when such previous experience is directly applicable.

b) MD-11.

Initial part 121 proving runs in accordance with provisions of § 121.163(a) have been completed by the initial part 121 operator of the MD-11. Subsequent proving tests in accordance with § 121.163(b) are appropriate in accordance with Order 8900.1, Volume 3, Chapter 29, Section 3. Credit in the form of proving run time reductions may be given for previous DC-10 experience for that operator when such previous experience is directly applicable.

9.3.5 MD-10 and MD-11 Forward Observer Seat.

The center/right forward observer seat is designated as the Administrator's seat, for meeting the requirements of § 121.581. Other cockpit observer seats (left) may be used by FAA inspectors at their discretion, such as when observing check airmen in the performance of their duties.

10 FSB SPECIFICATIONS FOR DEVICES AND SIMULATORS

10.1 Device and Simulator Characteristics.

Device and simulator characteristics pertinent to MD-10 or MD-11 variants are as specified by § 121.407, part 121 appendix H, the FAA NSP, the current edition of AC 120-54, Advanced Qualification Program, or AC 120-53, except as described below.

10.2 Special Device Requirements.

Special device or simulator characteristics are described for training, checking, and reestablishing currency as follows.

10.2.1 The FSB has determined the minimum device for differences training from MD-11 to MD-10 is a fully functional Level 4 FTD with the following systems: Overhead Panel (including system controllers and fire loops); Glareshield Control Panel (GCP); center instrument panel; FMS; forward pedestal (including flaps, throttles, and start levers).

10.2.2 When different engine display formats are used, due to operation with different engine types (MD-10-10/GE-CF6, MD-10-30/GE-CF6, and MD-10-40/PW-JT9 or MD-11 GE-CF6 and PW-4460 etc.), crews should be exposed to the alternate engine instrument presentations by some means (i.e., computer-based training (CBT), simulator, photos, drawings) adequate to assure proper display interpretation and use.

10.2.3 The combination of training devices and simulators should adequately address training requirements resulting from differences in optional equipment (e.g., CAWS altitude callouts, hydraulic/pneumatic thrust reverser differences in engine types (FADEC, non-FADEC), split cue/integrated cue flight directors, roll control wheel steering (RCWS) use).

10.2.4 Use of FTDs for Certain Check/Evaluation Items.

During static operations, certain FAA-approved MD-10 and MD-11 FTDs have identical characteristics to Level C or D simulators; therefore, certain ATP, type rating, or proficiency check/evaluation items may be completed in those FTDs. This is appropriate for items such as preflight FMS initialization or engine start non-normals. Specific checking credit in such instances must be approved by the POI following coordination with the NSP. When such credit is approved by the POI, use of this credit for a particular check is at the discretion of the FAA inspector/APD conducting the check.

10.3 Aircraft, Simulator, and Device Compatibility (Reference § 121.407).

When variants are flown in mixed fleets, the combination of simulators and training devices used to satisfy MDR and ODR provisions must match specific variants flown by that operator. The acceptability of differences between training devices, simulators, and airplanes operated must be addressed in the training program by the POI.

10.4 Device Approval.

Requests for training device approval should be made to the POI. If training device characteristics clearly meet established FAA criteria and have been qualified by the NSP, the POI may approve those training devices for that carrier. Where training devices do not clearly satisfy a given level, POIs should request advice from the FSB Chair, NSP, or the Air Transportation Division.

11 APPLICATION OF FSB REPORT

11.1 Operators with Only One Variant (No Differences).

Apply relevant parts of this report (i.e., type rating designation, checking maneuvers related to part 121) following the effective date of this report.

11.2 Operators with a Mixed Fleet.

11.2.1 In addition to the provisions of paragraph 11.1 as described above, compliance with MDRs, ODRs, and other relevant FSB report provisions is necessary.

11.2.2 For the MD-10 and MD-11, compliance with this report should be established prior to any part 121 operations.

12 ALTERNATE MEANS OF COMPLIANCE

12.1 Approval Level and Approval Criteria.

Alternate means of compliance to differences requirements of part 121 subparts N and O for mixed fleet operations, other than as specified in provisions of this report, must be approved by the Air Transportation Division. If Alternate compliance is sought, operators will be required to establish that the proposed alternate means provides an equivalent level of safety to the provisions of AC 120-53 and this FSB report. Analysis, demonstrations, proof of concept testing, differences documentation, or other evidence may be required.

12.2 Equivalent Safety.

In the event alternate compliance is sought, training program hour reductions, simulator approvals, and device approvals may be significantly limited and reporting requirements may be increased to assure equivalent safety. The FAA will generally not consider relief by alternate compliance unless sufficient lead time has been planned by an operator to allow for any necessary testing and evaluation.

12.3 Interim Programs.

In the event of clearly unforeseen circumstances in which it is not possible for an operator to comply with MDR provisions, the operator may seek an interim program rather than a permanent alternate compliance method. Financial arrangements, scheduling adjustment, and other such reasons are not considered “unforeseen circumstances” for the purposes of this provision.

APPENDIX 1. MASTER DIFFERENCE REQUIREMENTS

MD-10 and MD-11

Master Differences Requirements	
From Base Airplane	To Variant Airplane
MD-11	MD-10
	C*/B/B

Note: C* means MD-10 initial differences training only. Recurrent training should be accomplished at Level B/B/B in conjunction with a full 14 CFR parts 61 or 121 check.

DIFFERENCE LEVEL DEFINITIONS

Difference Level	Training	Checking	Currency
A	Self-Instructions	Not Applicable (or integrated with next PC)	Not Applicable
B	Aided Instruction	Task or System Check	Self-Review
C	Systems Devices	Partial Check Using Device	Designated System
D	Maneuver Devices	Full PC Using Device*	Designated Maneuver
E	Simulator C/D or Aircraft #	Full PC Using Simulator C/D or Aircraft*	Per 14 CFRs (Takeoffs and Landings in Simulator C/D or the Aircraft)

= at Level E FAA type rating is assigned
* = OE is required
PC = proficiency check

APPENDIX 2. EXAMPLE OF ACCEPTABLE ODR TABLES

Key:
FLT CHAR - flight characteristics
PROCDS - procedures changes

Methods Key:
CBT - computer-based training
FTD - flight training device

Operator Differences Requirements Table (ODR)

DIFFERENCE AIRCRAFT: MD-10 BASE AIRCRAFT: MD-11	DESIGN FEATURE/SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	Airplane Configuration	Dimensions Landing Gear	NO	YES	A Paper	A	A
	Panel Layout	Switches/Gages (Adds and Deletes) Switch Changes Switch Relocation	NO	YES	C FTD	B	B
	Weights	Changes Related to Series	NO	NO	A Paper	A	A
	Powerplant	General Electric CF-6	NO	NO	B CBT	B	B

DIFFERENCE AIRCRAFT: MD-10 BASE AIRCRAFT: MD-11	DESIGN FEATURE/SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	ATA 21 Air Conditioning	Air System Change: Trim Air Switch, Pack Switch, Bleed Air Switches Delete: System Select Sw	NO	YES	C FTD	B	B
	ATA 21 Air Conditioning	Pressurization Delete: Ditching Switch	NO	YES	C FTD	B	B
	ATA 22 Autoflight	Autothrottles ADIRU	NO	YES	C FTD	B	B
	ATA 23 Communications	Onboard Maintenance Terminal Enhances FPWS	NO	YES	B CBT	B	B
	ATA 24 Electrical Power	None	N/A	N/A	N/A	N/A	N/A
	ATA 25 Equipment/Furnishings	None	N/A	N/A	N/A	N/A	N/A
	ATA 26 Fire Protection	Engine and APU Test	NO	YES	B CBT	B	B
	ATA 27 Flight Controls	Flap/Slat Handle Operations Spoiler Operation Speedbrake Operations (No Interconnect with Flaps)	NO	YES	C FTD	B	B
	ATA 27 Flight Controls	Flap and Slats Description Limitations	NO	YES	B CBT	A	A
	ATA 27 Flight Controls	Delete: LSAS, Aileron Droop, Deflected Ailerons	NO	YES	A Paper	A	A

DIFFERENCE AIRCRAFT: MD-10 BASE AIRCRAFT: MD-11	DESIGN FEATURE/SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	ATA 28 Fuel	System Operation Manual	NO	YES	B CBT	B	B
	ATA 28 Fuel	Delete: Tail Fuel System, C.G. Control	NO	YES	A Paper	A	A
	ATA 29 Hydraulic Power	None	N/A	N/A	N/A	N/A	N/A
	ATA 30 Ice and Rain Protection	Engine Anti-Ice System Operation	NO	YES	B CBT	B	B
	ATA 30 Ice and Rain Protection	Delete: Tail Deice Ice Detection System	NO	YES	A Paper	A	A
	ATA 31 Instruments	Delete: Static Air Selector	NO	YES	A Paper	A	A
	ATA 32 Landing Gear	Landing Gear Series Unique (-10/-30) Turning Radius Delete: Tire Pressure	NO	YES	A Paper	A	A
	ATA 32 Landing Gear	Brakes Autobrakes Antiskid Brake Pressure Gauges Brake Temp (Series 30)	NO	YES	B CBT	B	B
	ATA 33 Lights	None	N/A	N/A	N/A	N/A	N/A
	ATA 34 Navigation	ADIRU TCAS Predictive Windshear	NO	NO	B CBT	B	B

DIFFERENCE AIRCRAFT: MD-10 BASE AIRCRAFT: MD-11	DESIGN FEATURE/SYSTEM	REMARKS	FLT CHAR	PROC CHNG	TRAINING	CHECKING	CURRENCY
	ATA 35 Oxygen	None	N/A	N/A	N/A	N/A	N/A
	ATA 36 Pneumatic	Delete System Controller Manual Operation	NO	YES	B CBT	B	B
	ATA 49 Airborne Auxiliary Power	System Operation	NO	YES	C FTD	B	B
	ATA 52 Doors	Lower Cargo Doors Operation and Inspection	NO	YES	A Paper	A	A
	ATA 52 Doors	Delete: Auto-Cargo Door Test	NO	YES	A Paper	A	A
	ATA 72 Turbine/Turboprop Engine	Engine Start Controls Fuel Levers Thrust Reverser Lockout Limitations	NO	YES	C FTD	B	B
	ATA 72 Turbine/Turboprop Engine	Delete: FADEC, Overboost Bar	NO	YES	C FTD	A	A

APPENDIX 3. AN ACCEPTABLE MD-10/MD-11 TRAINING PROGRAM

(14 CFR Part 121 Appendix E Program)
(14 CFR Part 121 Appendix H Program)
and
MD-10 Differences Training Program

General:

This document is intended to outline a typical, but not the only acceptable, approach to MD-11 initial and transition pilot training. This program consists of ground and flight training segments. The ground training segment consists of 15 days, encompassing 120 hours of integrated training. The flight segment consists of 10 days, encompassing 40 hours of simulator training.

Training Program Philosophy:

Both ground and flight training segments of the MD-11 training program are operational in nature. The ground training segment follows the principle of presentation of information through programmed instruction followed by reinforcement of that instruction in flight training devices (FTD). Following successful completion of the ground training segment, the trainee enters the flight training segment, which is designed to build upon the student's prior learning by introducing progressively more complex maneuvers and procedures.

This program is derived from a task analysis expressed as Crew Performance Objectives (CPO). CPOs were defined by the ATA Training Committee as guidelines for training and include need-to-know information required to perform normal, abnormal, and emergency procedures. It is presumed that a trainee entering this program will be a commercial pilot meeting the airline transport pilot (ATP) eligibility requirements with multi-engine turbojet experience but with no experience in electronic information systems (EIS), inertial navigation systems (INS) and inertial reference systems (IRS), autothrottle (A/T) or flight management systems (FMS).

Training Methods and Devices:

Training program materials are presented utilizing stand-up instruction, video tape, interactive computer-based training (CBT), cockpit procedures trainers, FTDs, and flight simulators.

Trainees are normally paired as crews for all portions of the training program involving hands-on cockpit operations. Trainee performance is evaluated on a daily basis by their instructor(s). Evaluation is also accomplished with CBT module tests and scheduled progress checks within the training program.

During the ground training segment, trainees will normally spend one-half of their training day in CBT and classroom instruction and one-half their training day with an instructor in preparation and execution of the associated FTD modules.

Flight training using FTDs, a flight simulator, and an airplane follows the ground training segment. The program outlined in this document provides for either advanced simulator training under part 121 appendix H, with associated Line-Oriented Flight Training (LOFT) or under 14 CFR part 61 and part 121 appendix E, with associated aircraft training and evaluation.

MD-11 Initial and Transition Training

Ground Training

Objectives:

The ground training segment of the MD-11 initial and transition training program develops crew performance objectives through a precise specification of learning objectives, programmed instruction, and post-training performance evaluation to insure that the student will:

a) Understand and be able to operate all aircraft systems.
b) Be proficient in all normal, abnormal, and emergency procedures.
c) Have acquired the knowledge and skill required to proceed to flight training.

Flight Training

Objectives:

The flight training segment uses Level 5 FTDs and Level C flight simulators. The crew concept approach is used throughout flight training. At completion of training, the student will:

a) Be able to safely and efficiently operate the MD-11 aircraft.
b) Demonstrate a satisfactory level of proficiency in all required maneuvers and procedures.

MD-10 Differences

Systems Integration Training

Training Objective

Initial MD-10 systems differences indoctrination for MD-11 qualified personnel. This program consists of a minimum of 3 days training: 1 day of CBT and 2 days of flight training in a Level 4 FTD. The Flight Standardization Board (FSB) has determined the minimum device for differences training from MD-11 to MD-10 is a fully functional Level 4 FTD with the following systems: overhead panel (including system controllers and fire loops); Glareshield Control Panel (GCP); center instrument panel; FMS; forward pedestal (including flaps, throttles, and start levers).

Required CBT:

- Aircraft general
- Flight controls
- Ice and rain
- Auxiliary power unit (APU)
- Landing gear/brakes
- FMS-navigation (NAV)
- Air system
- Fire systems
- Instruments
- Aircraft Interface Unit (AIU)
- Fuel
- Powerplants
- MD-10 exterior differences

Required Reading:

- Flightcrew Operating Manual (FCOM) Chapter 1 - Limitations
- FCOM Chapter 2 - Emergency and Abnormal Procedures, MD-10 Phase One Callouts

DAY ONE

Brief (2 hours)

General Concepts:

- Method of “blanking” unavailable functions on MD-10

Flight Controls:

- Longitudinal Stability Augmentation System (LSAS) differences
  - Operation without LSAS
  - Panel differences
  - Trim considerations

- Slat position differences
  - Normal slat positions
  - TO and LANDING depiction on the CONFIG synoptic

- Flap/slat handle design
  - Flap and slat handle description
    - Flap and slat handle linkage
    - Flap quadrant detents and gates
    - Flap and slat handle operation

- Auto ground spoiler deployment
  - Ground spoiler actuation

- Spoiler gate protection
  - Flight limitations
  - Flight lockout differences

- Aileron hydraulic source
  - Implication on autopilot system

Air:

- Auxiliary Air Panel (AAP)
  - AAP differences

- AAP purposes
  - Operation of the ECON switch
  - Effect on ECON switch on all packs
  - Manual trim air valves rocker switches operation
    - Purpose of using manual trim air valves rocker switches
    - When manual trim air valves rocker switches should be used

- Cargo heat control
  - CARGO HEAT switch location
  - Purpose of switch
  - CARGO HEAT operation

- General differences
  - Air system control panel
    - Manual operation requirements
    - Manual operation considerations
  - Cooling door differences
    - Pack cooling door operation as related to air conditioning pack selection
  - Avionics compartment
    - Overheat light
    - Differences
      - Meaning of illumination
  - Ditching switch omission
    - Implications of omitted ditching switch
    - Pack cooling door closure
    - Checklist usage

- Cargo heating and controls
  - Lower cargo compartment temperature control differences
    - Two variations of forward lower cargo compartment temperature control on the MD-10
      - MD-10-10s and some MD-10-30s
        - ❖ Circulation patterns
        - ❖ Temperature control
      - Other MD-10-30s
        - ❖ Forward compartment
          - ✓ Ventilation
          - ✓ Upper maintenance panel controls
        - ❖ Center and aft compartment temperature control

Flight Instruments:

- Versatile Integrated Avionics Computers (VIA)
  - VIA architecture
    - Overall purpose of VIA system
    - VIA architecture
      - Number installed
      - Purposes of VIAs 1 and 2
      - Purpose of auxiliary (AUX) VIA
  - DU information source
    - Normal display unit (DU) control for each VIA
    - VIA failure and backup
    - AUX VIA selection
  - Operation with single VIA
    - Capabilities when solely operating on VIA 1 or 2
  - Dual VIA 1 and 2 failure
    - Systems affected
    - DU backup input

- Aircraft Interface Unit (AIU)
  - AIU
    - General Description of AIU
    - Purpose of AIU
    - Number of AIUs installed
    - AIU backup capability
    - Systems affected by each AIU
    - Indications associated with AIU failure
    - Impact of AIU failure on electrical and hydraulic system synoptics

- Air Data Inertial Reference Units (ADIRU)
  - ADIRU
    - General Description of ADIRU
      - Comparison of MD-11 Central Air Data Computer (CADC) and IRU functionality on MD-11 to ADIRU functionality on MD-10
      - Number of ADIRUs
      - Respective output of each ADIRU to flight instruments
    - System Instrument Select Panel (SISP) control
      - Offside selection
      - SISP nomenclature as related to MD-10 CADC
    - AUX ADIRU switch location
    - Alternate static source differences
      - Omission
      - ADIRU functionality

- Global Navigation Satellite System (GNSS)
  - GNSS
    - General description
      - Number installed
      - Transparency to crew
    - IRU updating
    - Multipurpose control and display unit (MCDU) indications
    - ZULU time availability
    - Inhibiting functionality
    - Active updating indications
  - GNSS position information
    - GNSS position indications on MCDU

- MCDU
  - Speed computation and entry differences
    - TO/APPR page computations unavailable as a result of lack of MD-10 FMS V-speed calculations
      - SLOPE/WIND
      - Outside air temperature (OAT)
    - Manual V-speed entry
    - Manual V-speed entry primary flight display (PFD) indications

  - Center of gravity (CG) computation omission
    - Effect of fewer fuel probes on MD-10 vs. MD-11
    - Inflight CG indication differences

Powerplants/Autoflight:

- Full-Authority Digital Electronic Control (FADEC) components, controls, and indication differences
  - FADEC omission
  - FADEC panel differences
  - Impact on engine control
  - Monitoring concerns

- Start switch differences
  - Switch location

- Fuel lever differences
  - Design differences
  - Functionality
  - Fire indications
  - Operation

- N_1 display throttle position indication differences
  - N_1 indications
    - Throttle resolver angle omission
    - Operation of throttles in relation to N_1 indications

- "FUEL OFF" display omission
  - "FUEL OFF" indication differences

- Autothrottle system differences
  - Impact of FADEC omission on autothrottle power setting
  - Cautions
  - Procedures

- Engine Vibration Monitoring (EVM) omission
  - EVM system omission
  - Indication differences

Auxiliary Power Unit (APU):

- Normal/standby switch
  - APU control differences
    - Normal mode
    - Standby mode
      - When used
      - Impact on N_1 speed
      - Effect of electrical load

- APU start procedures differences
  - APU start and shutdown controls

- APU electrical load assumption differences
  - Controls
  - Procedures
  - Implications

- APU shutdown differences
  - Controls
  - Procedures
  - Implications

- APU air control differences
  - Isolation valve control differences

Fire Protection:

- Engine Fire Detection Panel (EFDP)
  - Purposes of EFDP
  - Controls
  - Indications

Landing Gear/Brakes:

- Automatic Brake System (ABS) differences
  - ABS omission on MD-10-10
  - MD-10-30 ABS
  - Autobrake arm switch
    - Location
    - Purpose
    - Implications of not setting

- Brake Temperature Monitoring System (BTMS) differences
  - BTMS omission on MD-10-10
  - MD-10-30 BTMS

- Tire Pressure Indicating System (TPIS) omission
  - TPIS omission on all MD-10s
  - Indication differences on CONFIG synoptic display
  - Antiskid system differences
  - Test button
    - Purpose
    - When used
    - Location

- Brake pressure indicating system differences
  - Gauge layout
  - Source pressure for each gauge

- Brake Construction differences
  - General description
  - Implications

Handling Characteristics:

- Normal landing
  - Effect of landing flaps 50
  - Implications of trimming and “holding aircraft off” during flare
  - Implications of flaring too early or abruptly
  - Implications of using aerodynamic braking

- Pitch up differences
  - Importance of “nose-lowering” procedures on touchdown
  - Benefits of lowering nose on touchdown

DAY TWO

Procedures and Maneuvers (4 hours) (Minimum Level 4 FTD)

Upper and Lower Maintenance Control Panel

Cockpit Seats Differences:
- Electric operation
- Manual operation

AAP:
- Auxiliary air control panel
- Discuss location
- Demonstrate manual trim air switch use
- Discuss cargo heat switch use

Ignition Control Panel:
- Ignition control panel differences
  - Discuss panel "blanking" for unavailable functions

Air Control Panel:
- Differences
  - Discuss manual air system configuration requirements
  - Demonstrate APU AIR switch operation
  - Discuss manual isolation valve configuration

- AAP
  - Demonstrate ECON switch use with all three packs operating

- ECON/cabin altitude switch differences
  - Discuss cabin altitude light omission
  - Discuss high cabin altitude indications

- Pack/bleed switch light differences
  - Discuss pack and bleed air switch flow and press light omission
  - Discuss associated alert indications

- Cooling door differences
  - Demonstrate air conditioning pack shutdown
    - View pack valve position indications for selected pack on upper maintenance panel

- Lower cargo compartment temperature control differences
  - Locate forward cargo temperature selector switch
  - Discuss maintenance's role in forward cargo temperature selector switch use

Fuel Control Panel Differences:
- Show liquid crystal display (LCD) quantity readout omission
- Discuss Tail Fuel omission implications

AUX Tank Depiction Differences:

- View MD-10-30 AUX Tank fuel synoptic indications
- Discuss AUX Fuel tank depiction

Engine Fire Detection System Control Panel:

- ENG/APU fire test switch location differences
  - Demonstrate Engine/APU fire test with both A and B Loop switches
    - Discuss associated indications
  - Demonstrate Engine/APU fire test with each switch, A and B, individually
    - Discuss associated indications
  - Discuss proper normal position for loop switches
  - Discuss when Loop switches are positioned out of normal setting
  - Demonstrate a "battery only" fire test and point out the difference

APU Control Panel:

- APU start procedures differences
  - Discuss APU start control
  - Demonstrate normal APU start
  - Discuss automatic electrical Load assumption omission

- APU electrical load assumption differences
  - Demonstrate connection of APU generator to electrical system
    - View electrical synoptic indications

- Normal/standby switch differences
  - Demonstrate standby mode operation
  - Discuss standby mode similarities with current Federal Express (FedEx) operation
  - Discuss when standby mode is used

Automatic Flight System (AFS) Control Panel:

- LSAS differences
  - Discuss omission of LSAS on MD-10

Engine Start Switch:

- Start switch differences
  - Locate start switch

MD-11 Ditching Switch Location:

- Ditching switch differences
  - Note the absence of the ditching switch

Landing Gear Control Panel:

- BTMS/TPIS differences
  - View BTMS indications on CONFIG synoptic
  - Discuss TPIS omission

ABS Control Panel:

- ABS differences
  - Locate ABS ARM switch

Antiskid Control Panel Area:

- Antiskid test button differences
  - Locate Antiskid test button.

- Antiskid switch differences
  - Locate Antiskid switch.

- Brake pressure indicator differences
  - Point out the dual pressure gauges

Fuel Levers:

- Fuel lever differences
  - Demonstrate fuel lever operation
    - Demonstrate ON and OFF locking pin and detent positioning
    - Emphasize implication of not locking fuel levers into position

Throttle Differences:

- Demonstrate throttle operation
  - Discuss throttle dimension differences
  - Discuss go-around button similarities to MD-11

Flap/Slat Handle:

- Flap/slat handle design differences
  - Demonstrate flap/slat handle operation to 0/EXT
  - Demonstrate slat retraction from 0/EXT position
  - Demonstrate flap extension to 22/EXT from 0/EXT
  - Discuss flap/slat handle gate
  - Demonstrate flap extension from 22/EXT to 50/EXT
    - Demonstrate flap retraction from 50/EXT to 22/EXT
    - Discuss potential difficulties related to gate
    - Demonstrate flap retraction from 22/EXT to 0/EXT
    - Demonstrate slat retraction from 0/EXT to UP/RET
    - Demonstrate Dial-a-Flap selection to 17/EXT
    - Demonstrate flap extension to Dial-a-Flap setting
    - Discuss Dial-a-Flap wheel slot and effect on flap setting operations
    - Discuss flap setting procedures out of Dial-a-Flap position
    - Discuss purpose for setting Dial-a-Flap to “index=0” position after takeoff
    - Demonstrate splitting of flap/slat handles
    - Discuss “splitting” restrictions
    - Demonstrate flap setting procedures with flap/slat handles split
      - View indications on CONFIG synoptic of flap movement in relation to slat position
    - Demonstrate flap/slat handle reconnection procedures
      - Discuss flap/slat handle disconnect similarity to MD-11 slat stow button
    - Demonstrate flap retraction from 35/EXT to 15/EXT

MCDU:

- Keypad difference
  - Locate air traffic control (ATC) key and the blank key adjacent to it
    - Discuss non-functionality of keys

- REF page difference
  - Discuss additional page 2

- Speed computation and entry differences
  - View OAT and slope/wind omissions on TO/APPR page
  - Discuss manual V-speed entry requirement

- GNSS differences
  - Discuss GNSS updating indication on navigation display (ND) and FMS INIT page
  - Discuss GNSS updating to IRUs
    - Locate GNSS-updated present position information on MCDU INIT page
  - Locate GNSS position on MCDU, POS REF, page 2

- Clock control function differences
  - Discuss ND clock source
  - Discuss master clock omission on MD-10

Phase of Flight Application (Minimum FTD Level 4)

Interior Safety Check:

- Discuss MD-10-10 parking brake setting during loading differences

Flight Deck Preparations (Captain):

- Monitor the following areas:
  - ENG/APU fire test
  - APU start
  - APU electrical power and bleed air application
  - Trim air panel (or AAP if installed)
  - Cargo heat switch
  - MD-10/AIR MANUAL check

Flight Deck Preparations (First Officer (F/O)):

- Accomplish F/O flight deck preparation
  - Discuss similarity to MD-11 procedure

Before Start Checklist:

- Conduct AIR MANUAL checklist

Engine Start:

- N_1 display throttle position indication differences
  - Review N_1 indications during start

After Start Checklist:

- Accomplish APU shutdown (including APU AIR switch)
- Accomplish AIR MANUAL checklist

Taxi (Before Takeoff Checklist):

- Slat position differences
  - View slat indications on CONFIG synoptic during position change

- Air system
  - Accomplish AIR MANUAL checklist

Takeoff:

- Autothrottle system
  - Discuss importance of pilot monitoring (PM) monitoring N_1 settings during takeoff roll
  - PM demonstrate N_1 monitoring during takeoff roll (see paragraph 6.1.9.f)

After Takeoff Checklist:

- Flap/slat handle design
  - Monitor the retraction of the flaps/slats.
  - PM demonstrate after takeoff Dial-a-Flap setting

Enroute Flight:

- Spoiler gate protection
  - Demonstrate spoiler handle movement to ground spoiler position
    - Emphasize hazards associated with in-flight spoiler deployment to ground spoiler position

- Center Accessory Compartment (CAC) manifold fail differences
  - Accomplish CAC manifold fail checklist with CAC manifold fail malfunction inserted

- AIU failure
  - View effects of AIU failure on AIR and secondary engine displays

- Operation with single VIA
  - View effects of AUX VIA failure
  - Discuss dispatch flexibility with AUX VIA deferred
  - Accomplish VIA 1 failure checklist

- Dual VIA failure differences
  - Discuss the accomplishment of “VIA FAILURES” checklist with VIA 1 and VIA 2 failed
  - Discuss implications of dual VIA failure on dependent systems

- ENG_LOOP_Differences
  - Accomplish Eng 1 Loop B checklist through fire warning activation

Approach Briefing:

- Slat disagree malfunction when slats are extended

Before Landing Checklist:

- Normal antiskid test
- Alternate testing means

Go-Around/Missed Approach/Rejected Landing:

- Flap/slat handle differences
  - Demonstrate flaps 22/EXT position use in go-around

After Landing Checklist

Shutdown Checklist

Additional Practice and Opportunity for Questions

Debrief (1 hour)

Answer Any Questions

Emphasize Positive Performance Points

Provide Constructive Criticism

Preview Next Training Event

Conditions:

- N/A

DAY THREE

Procedures and Maneuvers/ LOFT Training (4 hours) (Minimum Level 4 FTD)

General Concepts:

- The LOFT is used to expose the crew to various malfunctions that are unique to the MD-10. These malfunctions are introduced at different times throughout the flight and are listed in the events scenario.

LOFT Scenario:

- Cold weather operations
- MEL fuel system auto controller inop
- MEL APU Standby mode only (normal def.)
- MEL AUX VIA inop
- MEL ENG 1 Loop B inop
- Start malfunction - hot start
- Visual flight rules (VFR) cold weather
- CAC manifold failure
- Single VIA failure
- AIU failure
- Engine fire loop illuminated
- Localizer or Category (CAT) I approach

Debrief

APPENDIX 4. AIRCRAFT COMPLIANCE CHECKLIST

The MD-10/11 compliance checklist has been removed. It is retained on file at the Transport Aircraft Long Beach Branch, 3960 Paramount Boulevard, Suite 100, Lakewood, CA 90712-4137.

APPENDIX 5. HEAD-UP DISPLAY/ENHANCED FLIGHT VISION SYSTEM (HUD/EFVS)

The content of this appendix has been removed. Refer to 14 CFR part 61, § 61.66 for training and recency of experience requirements for enhanced flight vision system (EFVS) operations.

EFVS installed on this aircraft has been deemed operationally suitable for EFVS operations to 100 feet above the touchdown zone elevation (TDZE) only.