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BOEING 747 **B-747-100, -200, -300, -400, -400LCF, -8**

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RECORD OF REVISIONS

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1	Original	09/19/2002
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5	Appendix 8, Appendix 9, Deleted	02/26/2014

Highlights of Change:

Deleted Content of Appendix 8, Flight Crew Sleeping Quarters and Rest Facilities.

Content from Appendix 9 moved to Appendix 8.

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1. PURPOSE AND APPLICABILITY

1.1 Flight Standardization Board (FSB) Report Specifications. This FSB report specifies Federal Aviation Administration (FAA) master training, checking, and currency requirements applicable to crews operating B747 series aircraft under Title 14 of the Code of Federal Regulations (14 CFR) part 121. Various sections within the report are qualified as to whether compliance is required (considering the provisions of Advisory Circulars (AC) 120-53A, Guidance for Conduction and Use of Flight Standardization Board Evaluations), recommended, or advisory in nature. Provisions of the report:

- a) Identify pilot “type rating (s)” assigned to the B-747 series aircraft,
- b) Identify any unique requirements applicable to the initial, transition, upgrade or recurrent qualifications,
- c) Describe “Master Difference Requirements (MDR)” for crews requiring differences qualification for Mixed Fleet Flying (MFF) or transition,
- d) Provide examples of acceptable “Operator Difference Requirements (ODR)” tables,
- e) Describe acceptable training program and device characteristics when necessary to establish compliance with pertinent MDRs,
- f) Identify checking and currency standards including specification of those checks that must be administered by FAA or operators,
- g) List regulatory compliance status (compliance checklist) for the B-747 series for part 91, 121, and 125, ACs, or other operational criteria for information of FAA field offices.

Note: All regulatory references are from 14 CFR unless otherwise specified.

1.2 This report addresses the B-747 series aircraft as specified in the FAA Type Certificate Data Sheet (TDCS).

1.3 The provisions of this FSB report are effective until amended, superseded, or withdrawn by subsequent revisions to this report.

1.4 FSB Responsibility/Authority. Determinations made in this report are based on the evaluations of specific B747 series aircraft equipped in a given configuration and in accordance with (IAW) current regulations and guidance. Modifications and upgrades made to the models described herein, or introduction of other related aircraft, may require amendment of the findings in this report. The FSB reserves responsibility and authority to re-evaluate and modify sections of this report based on new or revised ACs, pertinent 14 CFR, aircraft operating experience, or the testing of new or modified aircraft under the provisions of AC 120-53A, as revised.

1.5 AQP/FSB Report Relationship. Differences between this report and an operator’s proposed training, checking, and currency requirements under an Advanced Qualification Program (AQP) must be justified and documented as part of the applicant’s AQP approval process. Program approvals under AQP need to ensure the basic provisions and requirements of this report have been addressed, and where necessary, coordination with the appropriate FSB has been completed.

1.6 Terminology. The term "must" is used in this FSB report and certain MDR footnotes, even though it is recognized that this report (as well as AC 120-53A, on which it's based) provides one acceptable means, but not necessarily the only means of compliance with 14 CFR requirements. This terminology acknowledges the need for operators to fully comply with this FSB report and MDR and ODR provisions if AC 120-53A is to be used by the operator as the means of complying with CFRs. Operators who choose this method must comply with each applicable MDR provision, including any footnotes.

1.7 FSB Report Comprehensiveness. This report includes:

- a) Minimum requirements for approval by FAA field offices, (e.g., MDRs, type rating designations, etc.),
- b) Information which is advisory in general, 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), and
- c) Information which is used to facilitate FAA review of an aircraft type or related aircraft proposed for the use by an operator (e.g. compliance checklist for FAA Field Office use)

Various sections of this report are qualified as to whether compliance (considering the provisions of AC-120-53A) is required, or is advisory in nature.

1.8 Relevant acronyms are defined as follows:

AC	Advisory Circular
ACO	Aircraft Certification Office
ADM	Air Data Module
AFDS	Automatic Flight Director System
AFM	Airplane Flight Manual
ADS	Automatic Dependent Surveillance
AOA	Angle Of Attack
AQP	Advanced Qualification Program
AP	Autopilot
ATC	Air Traffic Control
CBT	Computer Based Training
CCD	Cursor Control Device
14 CFR	Title 14 of the Code of Federal Regulations
CHDO	Certificate Holding District Office
CNS	Communications, Navigation and Surveillance
CPDLC	Controller-Pilot Data Link Communications
EFB	Electronic Flight Bag
EFIS	Electronic Flight Instrument System
EFVS	Enhanced Flight Vision System
EGPWS	Enhanced Ground Proximity Warning System
EICAS	Engine Indicating and Crew Alerting System
EVS	Enhanced Vision System
EVS II	Enhanced Vision System (Second Generation EVS)
FADEC	Full Authority Digital Engine Control

FANS	Future Air Navigation Systems
FGS	Flight Guidance System
FMA	Flight Mode Annunciator
FMS	Flight Management System
FSB	Flight Standardization Board
FTD	Flight Training Device
HUD	Heads Up Guidance Display
I-NAV	Integrated Navigation Display
INS	Inertial Navigation System
IRS	Inertial Reference System
LOE	Line Operated Evaluation
MMEL	Master Minimum Equipment List
MCDU	Multi-Function Control Display Units
MDR	Master Differences Requirements
MFF	Mixed Fleet Flying
ND	Navigation Display
ODR	Operator Differences Requirements
PFD	Primary Flight Display
POI	Principal Operations Inspector
QRH	Quick Reference Handbook
RAAS	Runway Awareness Advisory System
RNP	Required Navigation Performance
STARS	Shortened Transition and Rating Course
SV PFD	Synthetic Vision Primary Flight Display
TAWS	Terrain Awareness and Warning System
TCAS	Traffic Alert and Collision Avoidance System
TCE	Training Center Evaluator
TCPM	Training Center Program Manager
VGS	Visual Guidance System
VNAV	Vertical Navigation

2. PILOT TYPE RATING REQUIREMENTS

2.1 Type Rating. In accordance with the provisions of FAA Order 8900.1, Flight Standards Information Management System (FSIMS), and AC 120-53A, the Boeing 747-100, -200, SP and -300 is designated "B-747". The B747-400, 400LCF and 747-8 is designed "B-747-4".

2.2 Second-In-Command (SIC) Type Rating. In accordance with the provisions of the pertinent 14 CFR, FAA Order 8900.1 and AC 120-53A, an SIC type rating is assigned to the B-747-100, -200, SP and -300 is designated "B-747" with Limitations for "B-747 SIC Privileges Only", an SIC type rating is assigned to the B-747-400, 400LCF and 747-8 is designed "B747-4" with Limitations for "B-747-4 SIC Privileges Only".

3. "MASTER DIFFERENCE REQUIREMENTS" (MDRs)

3.1 Common Requirements (All B-747s).

3.1.1. Autopilot Engage Altitudes.

a) As referenced by approved Airplane Flight Manuals (AFM), the B-747 series has specifically been evaluated for autopilot suitability for engagement at or above 200 ft above ground level (AGL) during takeoff. For § 121.579 operators, authorization for autopilot engagement during takeoff is as designated by operations specifications.

b) Without LAND 2 or LAND 3 annunciated, the autopilot must be disengaged below 100 feet AGL.

3.1.2 Aircraft Approach Category and Circling Minima:

a) The B-747 series is considered Category D aircraft for the purposes of determining "straight-in" landing weather minima.

b) For circling, the aircraft approach category to be used for determining the circling minima is as specified in the Operations specifications for each operator.

3.1.3 Normal "Final Landing Flap Setting". The normal "final landing flap setting" per the pertinent 14 CFR is considered to be either "Flaps 25" or "Flap 30" for all B-747 aircraft.

3.2 Master Difference Requirements.

3.2.1 MDR requirements for particular B747 series of aircraft combinations. MDRs are shown in Appendix 1. These provisions apply when differences between related aircraft exists which affect crew knowledge, skills, or abilities related to flight safety (e.g., Level A or greater differences).

3.2.2 MDR Footnotes. Footnotes to MDR requirements define acceptable "required means" or "alternate 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 related aircraft.

4. ACCEPTABLE "OPERATOR DIFFERENCE REQUIREMENTS (ODR)" TABLES

4.1 ODR tables - Used to show an Operator's Compliance Method. Acceptable Operator Difference Requirements tables for operators conducting Mixed-Fleet-Flying, using a particular combination of B-747 series of aircraft are shown in Appendix 2. The ODR tables represent an acceptable means to comply with MDR provisions for this combination of aircraft, based on differences and compliance methods shown. The tables do not necessarily represent an acceptable means of compliance for operators with aircraft having other differences, where compliance methods (e.g., devices or simulators) are different, or for combinations of aircraft not evaluated. For operators flying related aircraft, which are the same as the aircraft used for the ODR table development and using the same compliance methods, the ODR tables in Appendix 2 have been found acceptable by the FAA. Thus, equivalent tables may be approved by the principal operations inspector (POI) for a particular operator.

4.2 Operator Preparation of ODR Tables. Operators flying B-747 series aircraft must have approved ODR tables. Operators flying B747 series aircraft similar to those covered by the acceptable ODR tables shown in Appendix 2 may use those tables. Operators with differences not shown on, or addressed by, the tables of Appendix 2, or operators seeking different means of compliance, must prepare and seek FAA approval of specific ODR tables pertinent to their fleet.

4.3 ODR Table Coordination. Unless identical or equivalent ODR tables have been previously approved by the FAA, new ODR tables proposed by operators should be coordinated with their POI and the FSB prior to FAA approval and implementation. By coordination, the FSB ensures consistent treatment of related aircraft between various operators, and compatibility of each ODR table with MDR provisions.

4.4 ODR Table Distribution. Original approved ODR tables are retained by the operator. Copies of approved ODR tables are retained by the Certificate Holding District Office (CHDO). Copies should also be forwarded to the B747 and/or B-747-4 FSB Chair, Seattle Aircraft Evaluation Group, (SEA-AEG).

5. FSB SPECIFICATIONS FOR TRAINING

5.1 General.

5.1.1 Assumptions Regarding Airmen Previous Experience. The provisions of this section apply to programs for airmen who have experience in both part 121 air carrier operations and multi-engine transport turbojet aircraft. For airmen not having this experience, additional requirements may be appropriate as determined by the POI, FSB, and the FAA Air Transportation Division, AFS-200.

5.1.2 Training for Seat Dependent Tasks. Accomplishment of certain tasks, procedures, or maneuvers requires training of a crewmember for a particular crew position (e.g. captain, first officer, international relief officer, check airman, etc.). Training programs should recognize and address the necessary seat/position related tasks for the applicable crewmember. Accordingly, training programs should address seat dependent tasks or maneuvers to the extent necessary to satisfy crew qualification objectives and should be in accordance with ODR tables when applicable.

5.1.3 Second-In-Command Training Tasks. Flight Crews qualify to serve as SIC must accomplish certain tasks, procedures or maneuvers for the SIC crew position. Training programs should address all training elements of the pertinent 14 CFR in accordance with FAA Order 8900.1. SIC pilot type rating may be issued in accordance with the pertinent 14 CFR provided training required by 14 CFR and FAA Order 8900.1, including tasks stipulated by this report, is completed.

5.1.4 Future Air Navigation Systems (FANS), Required Navigation Performance (RNP), Communications, Navigation, and Surveillance (CNS), Controller-Pilot Data Link Communications (CPDLC), and Automatic Dependent Surveillance (ADS). Flight Crews operating aircraft equipped with FANS software should receive appropriate instruction in its general operational functions, appropriate uses for areas of operation, routes, and procedures to be flown. General training should address CNS functions covered by FANS, and RNP. In addition, sufficient training in use of data link communication and ADS to ensure adequate knowledge, skill and proficiency for flight crews to operate the above systems in typical daily operations (requiring their use) should be provided.

5.1.5 B-747 Programs Crediting Previous Boeing EFIS/FMS Experience (AQP or STARS). Training programs for the B-747 may take credit for previous Boeing EFIS/FMS experience. An example of a B-747 training course crediting previous Boeing model FMS flight deck experience is shown in Appendix 5. Principal Inspectors for operators initially introducing a B-747 type

may approve programs consistent with programs previously approved or those of Appendix 5. For information regarding previously approved programs or programs crediting previous non-Boeing FMS/EFIS flight deck experience, FAA Principal Inspectors (PI) for other existing B-747 operators may be consulted.

5.1.6 B-747 Electronic Flight Bag (EFB). Refer to the Boeing EFB FSB report, located on the FAA's web site under FSIMS.

5.2 Initial, Upgrade, or Transition Training

5.2.1 Pilots: Initial, Transition and Upgrade Ground Training. Initial, transition, or upgrade ground training for either the B747 or B747-4 is accomplished as specified by 14 CFR. No unique provisions or requirements are specified. However, when more than one model is flown, or transition from one related aircraft to another is accomplished, appropriate instruction in unique aircraft systems will be required for each related aircraft, consistent with MDR provisions. Training program hours may be reduced as specified in 14 CFR, but not in a manner or in areas which invalidate compliance with provisions of the MDRs.

5.2.2 Pilots: Initial, Transition, and Upgrade Flight Training. Initial, transition, or upgrade flight training for either the B-747 or B-747-4 is accomplished as specified by 14 CFR. No unique provisions or requirements are specified. When initial, transition, or upgrade flight training and practice specified in 14 CFR are accomplished, and several related aircraft are to be flown, training is considered to suitably address each related aircraft, since flight characteristics of all related aircraft are the same or equivalent. Training program hours may be reduced as specified in 14 CFR, but not in a manner or in areas which invalidate compliance with provisions of the MDR or ODR tables.

5.2.3 Crewmember Emergency Training. Appropriate emergency training must be given to each crewmember on the location, function, and operation of emergency equipment that is different in each model of the B-747. Where equipment is common, instruction may be adjusted for those crewmembers qualified and current on other related aircraft, provided records are available, which demonstrate that crewmembers meet 14 CFR. For example, where elements of interior configurations are common, training may be simultaneously credited for series of aircraft. Conversely, for different emergency equipment, doors, slides, slide/rafts, or other interior configuration elements, even when within the same model (e.g., B-747-100 and B-747-200), training on emergency equipment for each related aircraft is required in accordance with MDRs. Training on the location, type, or operation of this equipment may be accomplished by pictures or electronic media provided adequate knowledge of its use is demonstrated to an authorized representative of the operator.

Emergency training also consists of instruction in crewmember emergency assignments and procedures including crew coordination and communication, the handling of emergency or other unusual situations, and emergency performance and observation drills that are specific to each series aircraft flown.

IAW 14 CFR § 121.417 and FAA Order 8900.1, emergency training requirements refer to two types of training: "general" and "aircraft specific" emergency training. General emergency training is instruction on those emergency items that are common to the B-747 series and all aircraft in an operator's fleet, e.g., instruction on fire extinguishers and fire fighting procedures,

if common to all aircraft. Aircraft-specific emergency training is training on those items that are specific to the B-747 or B-747-4 aircraft. An example of aircraft-specific emergency training is instruction on the location of emergency equipment.

As part of an approved training program, an operator may use many methods when conducting aircraft specific emergency training including classroom instruction, pictures or electronic media, ground training devices, Computer-Based Training (CBT), and/or static aircraft training.

There is no specified training program hours for Crewmember Emergency Training, however, a chart in FAA Order 8900.1 (Volume 3, Chapter 19, Section 4) provides “national norms” for the approval of general emergency training program hours related to new hires. The complexity of the different series of aircraft flown and the complexity of the type of operations conducted should be considered when approving B-747 and B-747-4 aircraft-specific emergency training.

5.2.4 Automatic Landings. If an operator conducts automatic landings in either the B-747 or B-747-4 then appropriate training must occur. This training must be conducted either in a B-747 or B-747-4 simulator or in the actual airplane, and may apply to one or both aircraft.

5.2.5. Areas of Emphasis. B-747 systems that require emphasis during ground and flight training include bank angle indications and protection, enhanced underspeed (stall) protection, overspeed protection, fly-by-wire systems, aircraft response and primary flight displays. The requirement to train certain traditional maneuvers to proficiency, such as steep turns and stalls may be addressed as a training proficiency issue. Therefore, steep turns and approach to stalls can be demonstrated during training and are not typically checked in a B-747-8 training program.

5.2.6 Electronic Checklists. The electronic checklist (ECL) (if installed) display system should be utilized when available to reduce crew workload. Use of the paper backup should also be trained. Standard practices and crew coordination should be established for use of ECL. To reduce workload, line items, which are sensed and indicate “completed” by the ECL system would not normally be read aloud.

5.2.7 Flight crew rest (FCR) and overhead flight attendant rest (OFAR) facilities for all B747 related aircrafts.

5.2.7.1 Occupancy. Only approved crewmembers, trained in FCR/OFAR evacuation procedures, may occupy the FCR. Clear definition of “crewmembers” allowed to occupy the OFCR must be specified in the operational approval to use this facility.

5.2.7.2 Crew Rest Quality. The B747 FCR/OFAR has been reviewed by the FAA and has been determined to meet requirements of the pertinent 14 CFR, and FAA AC 121-31, Flight Crew Sleeping Quarters and Rest Facilities, however specific operational approval for an operator to use the FCR is still required.

5.2.7.3 Approval will be based on the following guidance:

5.2.7.3.1 Rescue and Emergency Evacuation. Operators should have written procedures regarding rescue and evacuation pertaining to occupants of the FCR/OFAR compartment, if FCR/OFAR is used for Taxi, Takeoff or Landing (TTL). As a minimum the following is needed:

For planned evacuations, FCR/OFAR occupants should be relocated to the upper deck/main deck prior to landing if seats are available and time permits.

- a) If an in-flight emergency occurs where an evacuation is possible, and the situation permits, the crew must inform the appropriate Air Traffic Services Unit that there is an occupied FCR on board. This information should include the number of occupants and the location of the FCR on board.
- b) At least one cabin crew member is given responsibility to ensure occupants of the FCR/OFAR are evacuated if an evacuation command is given.

5.2.7.3.2 Training – Occupants. As a minimum, prior to occupying the FCR/OFAR, crewmembers must be familiarized with the conditions for occupancy and the safety provisions and equipment of the FCR/OFAR facility, to include the following:

- a) Maximum allowable occupancy for TTL and in flight
- b) Fire extinguishers and smoke hoods (fire fighting procedures)
- c) Emergency oxygen (decompression procedures)
- d) Primary and secondary escape routes (evacuation procedures)
- e) Reminder that all Flight Attendants will provide further direction after reviewing the outside conditions
- f) Communication system
- g) Occupant use of seat and ancillary equipment, seat belts and bunk restraints during turbulence and critical phases of flight
- h) Restrictions prohibiting bunk use during takeoff and landing, (as appropriate)

5.2.7.3.3 Procedures and Training - Flight Attendant. FCR/OFAR familiarization must also be included in flight attendant training to include the above items and an additional responsibility for ensuring the FCR/OFAR, if occupied, is evacuated during an airplane evacuation.

Procedures must be developed and included in training for the following:

- a) Closing the FCR/OFAR door after takeoff, and prior to landing
- b) Requirement to minimize rest disruptions
- c) Prevention of unauthorized entry to the FCR/OFAR compartment

5.3 Differences Training.

5.3.1 General. Unless an initial or transition program is completed for each series, differences training is necessary for each B-747 as provided in MDR and ODR tables. A training program addressing pertinent differences described by individual operator ODRs, including Normal, Non-Normal, and Alternate Operations, is required for each series flown.

- a). A Differences Training Program prerequisite is that a trainee has completed initial, upgrade, or transition training in one series aircraft and will receive differences training for the other series aircraft.
- b) When a Differences Training Program involves series aircraft having the same Pilot Type Rating, coverage of differences may be completed either coincident with each phase of an initial, upgrade, or transition training course, or following completion of that training course. The differences training must be consistent with the provisions of the approved applicable MDR/ODR Tables.

c) When a Differences Training Program involves series aircraft having different Pilot Type Ratings, coverage of a differences course must be completed in accordance with the prerequisites defined in 5.1.1, and applicable MDR/ODR provisions.

5.3.2 Ground Training. Differences ground training is required on the topics applicable to the pertinent series aircraft. Training is shown by applicable ODR tables in the following subjects:

- a) General description of the aircraft
- b) Performance characteristics
- c) Engines
- d) Airplane Systems (e.g. EICAS, hydraulics, electrical ...)
- e) Normal, Non-Normal, and Alternate Procedures
- f) Limitations
- g) Other instruction in features unique to the operator's fleet of B-747 airplanes

5.3.3 Flight Training. Difference flight training is required in the topics and maneuvers applicable to the pertinent related aircraft that is shown by applicable ODR tables. For an Advanced Qualification Program (part 121 Subpart Y), "flight qualification events" must be consistent with items specified by the applicable ODR tables.

NOTE: A sample of an acceptable minimum program for differences training is shown in Appendix 5.

5.3.4 Fleets with different Engine Types. Mixed flying of B-747 fleets with different engine types (e.g. GE or RR engines) may require additional training. Although not explicitly addressed by MDRs, a minimum of A/A/B is designated for such operations, unless otherwise approved by the FSB.

5.4 Recurrent Training

5.4.1 Recurrent Training. Recurrent training must include appropriate training in accordance with the pertinent 14 CFR, or an approved AQP program, for each aircraft (e.g., B-747 and B-747-4). When recurrent training addresses more than one series aircraft group, the differences must be covered in accordance with the items and levels specified by MDR and ODR tables for initial differences training, unless otherwise approved by the FSB.

5.4.2 Recurrent Ground Training Time Reductions. If recurrent ground training is reduced below programmed hours required in § 121.427(c), in accordance with § 121.405, such reductions must be consistent with MDR and ODR table provisions.

5.4.3 Recurrent Flight Training. Recurrent flight training requires appropriate maneuvers and procedures identified in the pertinent 14 CFR, or an approved AQP program, for series of aircraft (e.g., B-747 or B-747-4). Appropriate emphasis should be placed on systems and procedures that may not have been used operationally, and are expected to be used prior to the next recurrent training event (e.g. Electronic checklist, Data Link, RNAV, FANS, RNP, HUD, Electronic Flight Bag, Communications, etc.). As permitted by the pertinent 14 CFR, satisfactory completion of a proficiency check, in accordance with the pertinent 14 CFR, may be substituted for training. When ODR table provisions identify differences in maneuvers or procedures between related aircraft, such differences must be addressed in the operators' recurrent program. Flight training must be accomplished in a variant currently operated by flight crews.

5.4.4 Recurrent Training Level Adjustments. The FSB will consider proposals to establish recurrent differences training at levels other than for the initial differences training on a case by case basis. Requests for changes should be made to the FSB through the POI. If the FSB accepts different levels for recurrent training, and AFS-200 approves those changes, such provisions will be identified in amended MDR footnotes.

5.4.5 For Flight Attendants, B-747 recurrent training consists of instruction as necessary in the B-747 general operational subjects, as addressed in Paragraph 5.6.3, "Flight Attendants: Initial and Transition Ground Training" and in the B-747 related aircraft-specific emergency subjects, as addressed in Paragraph 5.2.3.

5.5 Operating Experience:

5.5.1 Operating Experience Pertinent to Each Flight Crewmember. Operating experience must be obtained while serving in a primary crew position.

5.5.2 Separate Operating Experience for Single Fleet Operations. Operating experience for the B-747 must be accomplished in any B-747. For the B-747-4 the operating experience must be accomplished in any B-747-4. For the B-747-8, operating experience may be accomplished in the B-747-4.

5.6 Other Training

5.6.1 LOFT Programs. When operators have LOFT programs, POIs should review those programs to assure their suitability for the aircraft flown. For example the LOFT programs include scenarios flown in either the B-747 or B-747-4. If simulators used for LOFT have differences from the related aircraft, LOFT credits may be reduced or eliminated if such differences are determined to have a significant adverse effect on the effectiveness of LOFT.

5.6.2 Flight Navigator. Flight Navigator initial and transition ground training is not applicable to the B747 aircraft.

5.6.3 Flight Attendants, Initial and Transition Ground Training. Due to differences in cabin configuration, flight attendants should be separately qualified in B-747 and B-747-4 aircraft. Such qualification, however, may be conducted concurrently when qualification is for both B-747 and B-747-4 aircraft. Credit is permitted for common subjects. See Appendix 7.

5.6.4 Aircraft Dispatchers, Initial and Transition. Dispatchers may be simultaneously qualified for B-747 and B-747-4 aircraft. Provisions of the pertinent 14 CFR are applicable to each related aircraft. If the aircraft are used in ER operations, dispatchers must be suitably qualified to address ER issues. Dispatchers must also be suitably trained to address any (all) differences in related aircrafts related to ER performance, procedures, or limitations.

6. FSB SPECIFICATIONS FOR CHECKING

6.1 General.

6.1.1 Checking Items. Knowledge, procedures, and maneuvers specified by the applicable 14 CFR, FAA Order 8900.1, or FAA Practical Test Standards (PTS), pertinent to multi-engine turbojet transport aircraft apply to all B-747 series aircraft. Part 121 checking items are accomplished as specified by the MDR and ODRs to qualify in pertinent B747 aircraft.

6.1.2 Areas of Emphasis. The following areas of emphasis should be addressed during checks as necessary:

- a) Proficiency with manual and automatic flight must be demonstrated,
- b) Proper outside visual scans without prolonged fixation on FMS operation should be demonstrated, and failure of component(s) of the FMS should be addressed,
- c) Proper selection and use of map displays, raw data, flight director, and AFDS should be demonstrated, particularly during instrument approaches,
- d) Demonstrations of FMS/GPS navigation (departures and approaches) proficiency if these type operations are approved for the operator,
- e) Demonstration on the use of electronic checklists (ECL) during Normal and Non-Normal procedures (if installed),
- f) Understanding of speed and attitude stability characteristics of B-747 flight controls in normal operations,
- g) Proper use and knowledge of the Look ahead Terrain Function of the EGPWS (if installed),
- h) Proper use and knowledge of the Predictive Wind Shear System (if installed), and
- i) Proper use of the Electronic Flight Bag (if installed).

6.1.3 “No-Flap” Landings. Due to redundant flap system features of all B-747 aircraft, demonstration of a “No Flap” approach and landing during the pertinent 14 CFR check is unnecessary, provided alternate flap systems operations (flaps-only or partial-flap) is evaluated.

6.1.4 MMEL/MEL Use. Dispatch relief under the provisions of the Operator’s MEL should receive appropriate emphasis as part of the normal checking process in order to address those issues related to crew workload and safety. Since an individual operator may elect to take advantage of the full range of relief provided under the MMEL, Certificate Holding District Offices should closely review specific MEL proposals to ensure that training and checking are sufficient to ensure satisfactory crew performance in both the normal and non-normal flight regimes. MEL relief should be granted only where it can be confirmed that safety will not be compromised as a function of crew experience, qualifications and training. Special attention should be given to checking to ensure that adequate training is provided to address dispatch with systems operated in alternate/degraded modes. Training and checking should also emphasize the crewmember’s ability to cope with the subsequent airborne failure of the next most critical system failure, e.g., failure of one or more features of the autoflight system.

6.2 Type Ratings.

6.2.1 Oral and Written Tests. Oral and or written examinations apply separately to each B-747 series (e.g. B-747 or B-747-4) and will be conducted prior to the Practical Test unless otherwise specified by ODR tables.

6.2.2 Practical Test. Practical tests may follow standard provisions of the pertinent 14 CFR, or approved Line Operational Evaluation (LOE) provisions of AQP. If AQP LOEs apply, suitable

LOEs should be available that are pertinent to the intended operations expected (e.g. oceanic scenarios, etc).

6.2.3 Application For and Issuance of Type Ratings. Airmen completing pertinent 14 CFR requirements in a B747 or B-747-4 with FSB requirements described in this report may apply to FAA for the appropriate B747 type rating endorsement. Upon completion of requirements and submission of an application (FAA Form 8710-1), authorized FAA inspectors or designees, may issue the necessary pilot certificate with type rating.

6.3 Proficiency Checks.

6.3.1 General. Proficiency checks are administered as designated in the pertinent 14 CFR or IAW an approved AQP program, for either the B747 or B747-4 aircraft, except as specified or permitted by MDR and ODR tables. When checks are conducted for Mixed Fleet Flying between the B-747-4 and the B-747-8, one aircraft is typically selected as the base aircraft, and a sufficient number of questions on the other related aircraft are covered to ensure effectiveness of differences preparation. The preflight and equipment examination portion of initial and recurrent proficiency checks should address each aircraft operated by the flight crewmember in Mixed-Fleet-Flying. Satisfactory completion of a proficiency check may be substituted for recurrent flight training as permitted in the pertinent 14 CFR.

6.4 Line Checks. Line checks completed for either a B-747 or a B-747-4 will satisfy requirements for the appropriate series of aircraft.

7. FSB SPECIFICATIONS FOR RECENCY OF EXPERIENCE

7.1 Recency of Experience is common between the B-747 and the B-747-4. Recency of experience required by 14 CFR may be maintained for the B-747/B-747-4 by accomplishing the required takeoffs and landings in the designated aircraft.

a) Alternate means of compliance with § 121.439 (a). Pilots that are dual qualified in the B-777 and B-747-4 may satisfy the provisions of § 121.439(a) by accomplishing three takeoffs and landings total, provided at least one takeoff and landing is accomplished in each type, each 90days.

Note: To reestablish takeoff and landing currency the requirements of § 121.439 must be complied with, except that at least one takeoff and landing must be accomplished in each type of aircraft or an advanced simulator approved for the takeoff and landing maneuvers.

b) Airman Experience (Prerequisite). Provisions within this section of the report apply to training programs for experienced flight crew members who have previous experience in both part 121 air carrier operations and multi-engine wide body heavy transport turbojet aircraft. Flight crews not having prerequisite experience shall not use the provisions of this report. In addition, the following pre-qualification requirements must be met by all flight crew participating in the landing currency provisions prescribed in this report:

1) 3 months of line operations in both the B-747-4 and the B-777 aircraft (including IOE in both aircraft types),

2) A minimum of 150 hours of line experience in both aircraft types (B-747-4 and B-777 must be while serving in a primary crew position).

8. AIRCRAFT COMPLIANCE CHECKLIST

8.1 Compliance Checklist (see Appendix 3). Compliance checklists are provided as an aid to FAA Certificate Holding District Offices (CHDOs) to identify those specific rules or policies for which compliance has already been demonstrated to the FAA for an aircraft having a particular aircraft type certificate. The checklist also notes rules or policies which remain to be demonstrated to CHDOs by operators. Not all rules or policies are necessarily listed or addressed. When differences exist between the aircraft evaluated with the compliance checklist and aircraft used by an operator, the CHDO evaluates those differences and approves use of that aircraft if that aircraft provides equivalent compliance with 14 CFR or FAA policies. It remains the responsibility of a Certificate Holding District Office to review compliance with pertinent rules or policies not already satisfactorily addressed in the compliance checklist, prior to part 121 approval of an operator for use of particular B-747 aircraft.

8.2 Discussion of Specific Compliance Checklist Items

8.2.1 B747 Observer Seat. On B747 series aircraft with two observer seats installed, one or both seats satisfy the requirements of § 121.581. Either seat may be used by FAA inspectors at their discretion.

8.2.2 Emergency Evacuation. The B747-400 configuration has successfully been demonstrated by a combination of earlier B747-100, -200, and -300 simulated emergency evacuations, credited under FAA Order 8900.1 Vol. 3, Chapter 10, Section 7 with 550 passengers and 14 crew. The evacuation included simulated evacuation of 3 additional children, each less than two years of age (laps), which are not shown in the total count of 550 passengers. Accordingly, a § 121.291 full scale evacuation is not necessary for aircraft configurations consistent with previously approved tests. Passenger capacity less than or equal to the previously demonstrated capacity of 550, and crew complement greater than or equal to 14 may be authorized. A mini-evacuation is required unless the particular certificate holder has previously operated a B-747 series with the same or similar interior and exit configuration.

8.2.2.1 Operations with Upper Deck Passengers, B-747-100 and -200 Airplanes, 8 and 16 Passenger Configurations on Upper Deck. With respect to operations with B-747-100/200 airplanes that have 8 and 16 passengers seated in the upper deck for takeoff and landing. The following limitations continue to apply, post Amendment # 288 to § 121.313:

For 8 passenger configurations: The FAA requirement to have two defined escape routes for passengers seated on the upper deck remains in effect, The FAA continues to accept the fact that the Primary Escape Route is defined as down the stairway and out the main deck exits, L-1 and R-1, and further, the FAA continues to accept the fact the Alternate Escape Route is defined as through the flightdeck door and out the flightcrew/service door escape slide. A Cabin Attendant must be seated on the upper deck whenever passengers are carried. The *locked* cockpit door between the passengers and *the* right hand crew service door must have features as follows:

a) The door must be unlocked electrically when airplane power is lost, or *be unlockable* by a switch operated by the flight crew.

b) The door must *unlock* when an *unlocking sequence is initiated by a crewmember and the door must remain unlocked when the door is unpowered*.

c) The cabin attendant must *have the capability to enter the flightdeck in the event that a flight crewmember becomes incapacitated*.

Note: This requirement has been evaluated and is found to be fully equivalent to having a key, as was provided for prior to Amendment # 288 to § 121.313.

For 16 Passenger configurations: The previously defined limitation for 8 passenger configurations and the following elements of the Type Certification Basis for 16 passengers continues to be required:

a) A smoke barrier is required in the circular stairwell to the upper deck,

b) Certain improvements must have been incorporated in the crew service door slide. For the record, those improvements were made to the slide to enable the slide to be serviceable in winds up to 25 knots.

c) Evacuation tests were conducted to show that the two escape routes are each equivalent to a pair of Type III doors. (The results of these tests have been recorded in Document D6-33418, "Model 747 Upper Deck Evacuation Demonstrations – 16 Passengers (FAA Certification.)", dated 12/20/71.

d) Further special conditions are not required.

Note: These Special Conditions were approved by the FAA in February 1972.

In either case, for both 8 passenger upper deck configurations and 16 passenger upper deck configurations, the FAA does not require that these airplanes display a placard on the flight deck door to indicate that the flight deck door be open during takeoff and landing. The primary escape route for these upper deck passengers to reach the required emergency exit(s) is down the circular stairway and out doors L-1 and R-1.

8.2.3 Proving Runs. Initial part 121 proving runs in accordance with provisions of the pertinent 14 CFR for the B-747/B-747-4 have been completed.

8.2.3.1 For B-747/B-747-4/B-747-8 aircraft new to an operator. Proving runs in accordance with the pertinent 14 CFR are appropriate in accordance with FAA Order 8900.1, Vol. 3, Chapter 29.

8.2.3.2 Proving run requirements and reductions are as designated by FAA Order 8900.1 and the Certificate Holding District Office, or as otherwise specified by the FSB or AFS-200.

9. FSB SPECIFICATIONS FOR DEVICES AND SIMULATORS

9.1 Standard Devices and Simulators. Device and Simulator characteristics pertinent to B747 and B747-4 aircraft are as designated in AC 120-40, Airplane Simulation Qualification, and 120-45, Airplane Flight Training Device Qualification, (as amended), except as described below.

9.2 Special Requirements. Special device or simulator characteristics are described for training, checking, and re-establishing currency as follows:

9.2.1 When different EICAS engine display formats are used, due to operation with different engine types (GE and RR), crews should be exposed to the alternate EICAS presentations by some means (e.g. photos, drawings CBT, etc), which would assure proper display interpretation and use by the flight deck crew (See paragraph 5.3.3).

9.3 Devices Used for Recurrent Proficiency Checks. Recurrent checking is to be accomplished in the relevant B-747 or B747-4 simulators. Checking and simulator use proposals where simulators do not closely match the related aircraft to be flown are evaluated on a case by case basis by the POI, in consultation with the FSB. A POI, FAA inspectors, designated examiners, or check airmen may require demonstration of competency in a simulator or the aircraft representing the related aircraft to be flown, when doubt exists regarding training program adequacy, or an airman's preparation or competency.

10. APPLICATION OF FSB REPORT

10.1 Operators of B-747 or B-747-4 Aircraft without Differences. Relevant parts of this report (e.g. type rating designation, checking maneuvers, etc.,) are effective when the report is approved by the FAA. Sections or paragraphs of this report related to differences (e.g. MDRs, ODRs, etc.) may be voluntarily applied to facilitate transition programs, when approved by the FAA.

10.2 Operators of B-747 and B-747-4 in Mixed Fleets. For Mixed-Fleet-Flying of B-747 and B-747-4, unless otherwise approved, operations must be in accordance with relevant provisions of this report, including approved MDR and ODR tables. This includes items in 10.1 above. It is recognized that a time period may be required for operator specific ODR table preparation, device approvals, bulletin issuance, etc. to establish compliance. Accordingly, when ODR tables describing compliance methods for an operator are approved by FAA, interim programs or interim extension of present programs may be made until a mutually agreed compliance date.

11. ALTERNATE MEANS OF COMPLIANCE

11.1 Approval Level and Approval Criteria. Alternate means of compliance to differences requirements of pertinent 14 CFRs for B-747 series aircraft, other than as specified in provisions of this report or as approved under an AQP, must be approved by the Flight Standards, Air Transportation Division (AFS-200). Any differences petitioned under AQP must be coordinated with AFS-280, the POI, and the FSB. If alternate means of 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 120-53A, and this FSB report. Analysis, demonstrations, proof of concept testing, differences documentation, or other evidence may be required.

11.2 Equivalent Safety. In the event alternate means of 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. AFS-200 will generally not consider relief by alternate means of compliance unless sufficient lead time has been planned by an operator to allow for any necessary testing and evaluation.

11.3 Interim Programs. In the event unforeseen circumstances make it impossible for an operator to comply with MDR provisions, the operator may seek interim program approval rather than a permanent, alternate compliance method. Financial arrangements, scheduling adjustments, and

similar justifications are not considered to be "unforeseen circumstances" for the purposes of this provision.

12. APPENDICES

APPENDIX 1

MASTER DIFFERENCES REQUIREMENTS

MASTER DIFFERENCES REQUIREMENTS (MDR) TABLE

AIRPLANE TYPE		FROM AIRPLANE					
	B-747-100	B-747-200	B-747-SP	B-747-300	B-747-400	B-747-400 LCF	B-747-8
TO							
1 B-747-100	A/A/A (1) NAV B/B/C (2) FFRATS – B/B/C (3) Freighter – A/A/B	B/B/B (1) NAV B/B/C (2) FFRATS – B/B/C (3) Freighter – B/B/B	B/B/B (1) NAV B/B/C (2) FFRATS – B/B/C (3) Freighter – B/B/B	B/B/B (1) NAV B/B/C (2) FFRATS – B/B/C (3) Freighter – B/B/B	NA	NA	NA
2 B-747-200	B/B/B (1) NAV B/B/C (2) FFRATS – B/B/C (3) Freighter – B/B/B	A/A/A (1) NAV B/B/C (2) FFRATS – B/B/C (3) Freighter – A/A/B	B/B/B (1) NAV B/B/C (2) FFRATS – B/B/C (3) Freighter – B/B/B	B/B/B (1) NAV B/B/C (2) FFRATS – B/B/C (3) Freighter – B/B/B	NA	NA	NA
3 B-747-SP	B/B/B (1) NAV B/B/C (2) FFRATS – B/B/C (3) Freighter – B/B/B	B/B/B (1) NAV B/B/C (2) FFRATS – B/B/C (3) Freighter – B/B/B	A/A/A (1) NAV B/B/C (2) FFRATS – B/B/C (3) Freighter – A/A/B	B/B/B (1) NAV B/B/C (2) FFRATS – B/B/C (3) Freighter – B/B/B	NA	NA	NA
4 B-747-300	B/B/B (1) NAV B/B/C (2) FFRATS – B/B/C (3) Freighter – B/B/B	B/B/B (1) NAV B/B/C (2) FFRATS – B/B/C (3) Freighter – B/B/B	B/B/B (1) NAV B/B/C (2) FFRATS – B/B/C (3) Freighter – B/B/B	A/A/A (1) NAV B/B/C (2) FFRATS – B/B/C (3) Freighter – A/A/B	NA	NA	NA
5 B-747-400	E/E/D D=90 Days	E/E/D D=90 Days	E/E/D D=90 Days	E/E/D D=90 Days	A/A/A	A/A/A	C/C/B
6 B-747-400 LCF	E/E/D D=90 Days	E/E/D D=90 Days	E/E/D D=90 Days	E/E/D D=90 Days	A/A/A	A/A/A	C/C/B
7	E/E/D	E/E/D	E/E/D	E/E/D	C/C/B	C/C/B	A/A/A

B-747-8	D=90 Days	D=90 Days	D=90 Days	D=90 Days			
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(1) INSTALLATION OF PERFORMANCE MANAGEMENT SYSTEMS (PMS) OR DIFFERENT INS MAY REQUIRE ADDITIONAL TRAINING, CHECKING, AND CURRENCY

(2) INSTALLATION OF FULL FLIGHT REGIME AUTOTHROTTLE SYSTEMS (FFRATS) MAY REQUIRE ADDITIONAL TRAINING, CHECKING, AND CURRENCY

(3) MIXED OPERATION OF PASSENGER, COMBI, OR FREIGHTER VARIANTS REQUIRES TRAINING, CHECKING, AND CURRENCY AS DESIGNATED A/A/B

(4) MIXED OPERATION OF PASSENGER, COMBI, OR FREIGHTER VARIANTS REQUIRES TRAINING, CHECKING, AND CURRENCY AS DESIGNATED B/B/B

NA IN BLOCKS DENOTES FSB HAS NOT YET ESTABLISHED MINIMUM STANDARDS

SEPARATE TYPE RATINGS VARIANT GROUPS SHOWN BY HEAVY BOLD LINES

APPENDIX 2

ACCEPTABLE ODR TABLES AND RELATED NOTES

747-400 To 747-8F OPERATOR DIFFERENCES REQUIREMENTS TABLE

DESIGN OPERATOR DIFFERENCE REQUIREMENTS TABLE								
DIFFERENCE AIRCRAFT: 747-8F BASE AIRCRAFT: 747-400 APPROVED BY (POI): _____				COMPLIANCE METHOD				
				TRAINING			CHKG/CURR	
DESIGN FEATURE	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	FPT Differences Completion	CURR
AIRPLANE CONFIGURATION	BODY EXTENSION "220" LENGTH 250' 2"	MINOR	NO		CBT			
	WING TIP EXTENSION "139" WINGSPAN 224' 7"	MINOR	NO		CBT			
	NO WINGLET	MINOR	NO	*				
PANEL LAYOUT	CHANGES FOR MFD CONTROL/ AND SWITCH REALIGNMENT	NO	YES			FPT	YES	
	ADDED OVERSPEED, EFB AND ECL CONTROLS	NO	NO			FPT	YES	
	DISPLAY SELECT PANEL	NO	NO			FPT	YES	
	SYSTEM ADVANCEMENT/AUTOMATION	NO	YES		CBT		YES	
WEIGHTS	INCREASED TO: MTW - 978,000 lbs MTOW - 975,000 lbs MLW - 749,000 lbs MZFW -709,000 lbs	NO	NO		CBT			

DESIGN OPERATOR DIFFERENCE REQUIREMENTS TABLE								
DIFFERENCE AIRCRAFT: 747-8F BASE AIRCRAFT: 747-400 APPROVED BY (POI): _____				COMPLIANCE METHOD				
				TRAINING			CHKG/CURR	
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	FPT Differences Completion	CURR
21 AIR COND. & PRESSURIZATION	ECS AND BLEED AIR CONTROL PANEL REVISION	NO	YES		CBT			
	AVS	NO	YES		CBT			
23 COMMUNICATIONS	KEYPAD ENTRY – RADIO TUNING PANELS/ARINC 781 SATCOM SYSTEM	NO	NO		CBT			
	ATC DATALINK BLOCK ON EICAS DISPLAY	NO	NO		CBT			
	777 STYLE ACCEPT/CANCEL/ REJECT ATC DATALINK SWITCHES ON GLARESHIELD	NO	YES		CBT			
	CURSOR CONTROL PANELS (CCP) WHICH PROVIDE INTERFACE WITH ECL “TABBERS”	NO	YES			FPT		
	MAIN DECK ALEART	NO	YES		CBT			
	COMMUNICATION MESSAGES	NO	YES			FPT		
24 ELECTRICAL	POWER OUTLETS FOR PILOTS	NO	NO	*				

DESIGN OPERATOR DIFFERENCE REQUIREMENTS TABLE								
DIFFERENCE AIRCRAFT: 747-8F BASE AIRCRAFT: 747-400 APPROVED BY (POI): _____				COMPLIANCE METHOD				
				TRAINING			CHKG/CURR	
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	FPT Differences Completion	CURR
25 EQUIPMENT/ FURNISHINGS	FULL FORMAT PRINTER	NO	NO		CBT			
26 FIRE PROTECTION	LAV SMOKE EICAS MESSAGE - ENABLE	NO	YES		CBT			
27 FLIGHT CONTROLS	FBW OUTBOARD AILERONS, AILERON DROOP FUNCTION, FBW SPOILERS	MINOR	NO		CBT			
	INBOARD DOUBLE-SLOTTED AND OUTBOARD SINGLE- SLOTTED FLAPS	MINOR	NO		CBT			
	LEADING EDGE FLAPS	MINOR	YES		CBT			
	LEADING EDGE FAILURE INDICATION SYSTEM(LEFI)	NO	NO		CBT			
	ADD PACS FUNCTIONALITY	MINOR	NO		CBT			
	SPUDDER	MINOR	NO		CBT			
	MANEUVER LOAD ALLEVIATION	MINOR	NO		CBT			
	DEDICATED FLIGHT CONTROLS SYNOPTIC DISPLAY	NO	NO		CBT			
STAB TRIM INFORMATION ON EICAS DISPLAY	NO	NO		CBT				

SYSTEM OPERATOR DIFFERENCE REQUIREMENTS TABLE								
DIFFERENCE AIRCRAFT: 747-8F BASE AIRCRAFT: 747-400 APPROVED BY (POI): _____				COMPLIANCE METHOD				
				TRAINING			CHKG/CURR	
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	FPT Differences Completion	CURR
28 FUEL	CAPACITY INCREASE	NO	YES		CBT			
	TANK CONFIGURATION RESERVE LOGIC	NO	YES		CBT			
	NGS	NO	NO		CBT			
	FUEL PANEL JETTISON	NO	YES		CBT			
29 HYDRAULIC	RAM AIR TURBINE	MINOR	YES		CBT			
	HYDRAULIC CONTROL PANEL – PUMP CONFIGURATION AND FUNCTION REVISIONS	NO	YES		CBT			
30 ICE AND RAIN PROTECTION	WING ANTI-ICE	NO	YES		CBT			
	WINDOW HEAT	NO	NO		CBT			

SYSTEM OPERATOR DIFFERENCE REQUIREMENTS TABLE								
DIFFERENCE AIRCRAFT: 747-8F BASE AIRCRAFT: 747-400 APPROVED BY (POI): _____				COMPLIANCE METHOD				
				TRAINING			CHKG/CURR	
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	FPT Differences Completion	CURR
31 FLIGHT INSTRUMENTS	INTERGRATED APPROACH NAVIGATION (IAN)	NO	NO			FPT		
	GLOBAL NAVIGATION SATELLITE LANDING SYSTEM (GLS)	NO	NO		CBT			
	NAVIGATION PERFORMANCE SCALES (NPS)	NO	NO		CBT			
	VERTICAL SITUATION DISPLAY (VSD)	NO	NO		CBT			
	CLOCK FUNCTIONALITY DISPLAY ON ND (UTC & CHRONO)	NO	NO		CBT			
	ELECTRONIC CHECKLIST (ECL)	NO	YES			FPT	YES	
	FMCS – DISPLAY OF VERTICAL BEARING, FLIGHT PATH ANGLES AND VERTICAL SPEED – ENABLED	NO	NO			CBT	YES	
	AIRPORT MAP	NO	NO			CBT		
	777 STYLE DISPLAY SELECT PANEL (DSP) INCLUDES ECL, MFD SWITCHING, FTCL SWITCHES	NO	YES			FPT	YES	
777 STYLE DISPLAY INBOARD DISPLAY (ND) SELECTOR	NO	YES			CBT			

SYSTEM OPERATOR DIFFERENCE REQUIREMENTS TABLE								
DIFFERENCE AIRCRAFT: 747-8F BASE AIRCRAFT: 747-400 APPROVED BY (POI): _____				COMPLIANCE METHOD				
				TRAINING			CHKG/CURR	
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	FPT Differences Completion	CURR
32 LANDING GEAR	TWO POSITION LANDING GEAR LEVER	NO	YES		CBT			
33 LIGHTS	PASSENGER SIGNS- DELETION OF "NO SMOKING" SWITCH	NO	YES	*				
34 NAVIGATION	EFB PROVISION, EFB OPTIONAL	NO	YES			FPT		
	FLIGHT MANAGEMENT COMPUTER QUIET CLIMB FANS-2 DATALINK GLS APPROACHES GPS APPROACHES WITH VERTICAL ANGLES ENABLED	NO	YES			FPT		
	ADIRU CONFIGURATION	NO	YES		CBT			
	CTR AIR DATA SWITCH	NO	YES		CBT			
	ADF REMOVAL (DUAL SYSTEM OPTION)	NO	YES		CBT			
	FMCS - NDB APPROACHES – ENABLED	NO	YES		CBT			

SYSTEM OPERATOR DIFFERENCE REQUIREMENTS TABLE								
DIFFERENCE AIRCRAFT: 747-8F BASE AIRCRAFT: 747-400 APPROVED BY (POI): _____				COMPLIANCE METHOD				
				TRAINING			CHKG/CURR	
SYSTEM	REMARKS	FLT CHAR	PROC CHNG	LVL A	LVL B	LVL C	FPT Differences Completion	CURR
73, 74, 77, 80 POWER PLANT	GENX-2B7 ENGINES	MINOR	YES		CBT			
	ENGINE START PANEL – DELETION OF IGNITER SWITCHES AND OPTIONAL AUTOSTART SWITCH	NO	YES		CBT		YES	
	ENGINE INOPERATIVE 10 MINUTE TAKEOFF THRUST OPERATION	NO	YES		CBT			

APPENDIX 3

AIRCRAFT COMPLIANCE CHECKLIST

This checklist applies to the B-747. Items that are identified as “CHDO” need to be evaluated by Principle Inspectors at the Certificate Holding District Office prior to the B-747 aircraft being used in part 121 revenue service. Items marked “complies” have either been found to directly comply with the applicable rule, or the necessary data or procedures are available to permit assessment for compliance of a B-747 for a particular operation (e.g. as for takeoff obstacle clearance assessment pertinent to § 121.189). Items marked NA are not applicable to the B-747 aircraft.

14 CFR PART 91

Subpart A – General

§ 91.9 Civil Aircraft flight manual, marking, and placard requirements

(a) - (b) The 747 supports these requirements by documenting the airplane limitations in the Airplane Flight Manual as required per § 25.1581 and displaying the markings and placards as required per §§ 25.1541, 25.1557, 25.1561, 25.1543, and 25.1555.

(c) The 747 design meets the marking requirements of part 45.

(d) This requirement is for rotorcraft and does not apply to the 747.

Portable Electronic Devices

(a)-(c) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design. Compliance is the responsibility of the aircraft operator.

Subpart B – Flight Rules

§ 91.11 Aircraft Speed

(a)-(c) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design. Compliance is the responsibility of the aircraft operator.

(d) Airspeed limitations are listed in the Airplane Flight Manual (AFM).

§ 91.17 Takeoff and landing under IFR

(a)- (k) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design. Compliance is the responsibility of the aircraft operator.

(l)-(m) do not apply since the 747 design does not include an enhanced flight vision system (EFVS).

§ 91.180 Reduced Vertical Separation Minimum Airspace

The 747 is designed to be able to obtain Aircraft Approval according to the RVSM standards specified in Section II, Appendix G of part 91.

§ 91.191 Category II and Category III Manual

(a) – (c) The 747 is designed to operate in Category II and III operations, and relevant procedures are reflected in the manual. However, this paragraph does not apply to operations conducted under part 121 or 135, as stated in § 91.191(c).

Subpart C – Equipment, Instrument and Certificate Requirements

§ 91.203 Civil Aircraft: Certifications Required

(a) - (b) The 747 will be delivered with a current airworthiness certificate appropriately displayed. The holder for the airworthiness certificate, registration certificate, and radio license is installed on the forward face of the flight deck's aft bulkhead next to the door.

(c) The 747 design does not include provisions for fuel tanks in the passenger compartment or the baggage compartment.

(d) The 747 propulsion system design complies with the relevant requirements of part 34.

§§ 91.205 Powered Civil Aircraft with Standard Category U.S. Airworthiness Certificates; Instrument and Emergency Requirements

(a) 747 instruments and equipment support this operational requirement.

(b)(1) – (b)(5) The 747 primary flight displays and engine indications meet these requirements.

(b)(6) This requirement does not apply to turbine powered aircraft.

(b)(7) The 747 engine indications meet these requirements.

(b)(8) This requirement does not apply to turbine powered aircraft.

(b)(9) – (b)(10) The 747 fuel quantity indicator and engine indications meet these requirements.

(b)(11) This requirement applies to small civil aircraft and as such does not apply to the 747.

(b)(12) Ditching equipment in compliance with § 25.1415 is provided.

(b)(13) Safety belts compliant with § 25.785 are provided.

(b)(14) This requirement applies to small civil aircraft and as such does not apply to the 747.

(b)(15) An emergency locator transmitter (ELT) compliant with § 91.207 is provided (25.1415 for overwater-equipped airplanes).

(b)(16) This requirement does not apply to the 747 since it has more than 9 passenger seats.

(b)(17) This requirement applies to rotorcraft and as such does not apply to the 747.

(c)(1) – (c)(6) The 747 design meets these requirements. Requirements for instruments and equipment in paragraph (b) are addressed above.

(d)(1) Requirements for instruments and equipment in paragraph (b) and (c) are addressed above.

(d)(2) 747 radio communication system and navigational equipment support this requirement.

(d)(3) The exception described in paragraph (3)(i) applies, since the 747 has a third attitude instrument which meets those requirements.

(d)(4) – (d)(9) – The 747's instrumentation meets these requirements.

(e) The 747 instrumentation includes distance measuring equipment (DME).

(f) – (h) The 747 is designed to operate in Category II and III operations, and will comply with requirements in part 91 Appendix A. This paragraph does not apply to operations conducted under part 121/135, as stated in § 91.205(h).

§ 91.207 Emergency Locator Transmitters

(a) - (f) The 747 is delivered with an ELT that meets these requirements. For overwater equipped 747, an ELT compliant with § 25.1415 is installed.

§ 91.209 Aircraft Lights

(a) – (b) All requirements of this paragraph are met by the design of the 747 with the exception of the lighting requirements for an anchored airplane (subparagraph 3), which do not apply to the 747 airplane.

§ 91.211 Supplemental Oxygen

(a) The 747 is pressurized, and is equipped with supplemental oxygen to meet these requirements in the event of a loss of cabin pressurization.

(b) 747 Crew and passenger oxygen systems compliant with §§ 25.1441, 25.1443, and 25.1447 support the operation of the airplane as defined by this requirement.

§ 91.213 Inoperative Instruments and Equipment

(a) - (b) The 747 supports these requirements with a Master Minimum Equipment List (developed as described in Boeing Document D639U200-01, Response to AEG O-4) and Dispatch Deviation Guide.

(c) - (e) The requirements are operational in nature and as such compliance is not directly dependent on the 747 design.

§ 91.215 ATC Transponder and Altitude Reporting Equipment and Use

(a) The transponder equipment included in the 747 design meets the requirements of this paragraph.

(b) – (c) The 747 design includes the equipment necessary to support these requirements.

(d) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.

§ 91.217 Data Correspondence between Automatically Reported Pressure Altitude Data and the Pilots Altitude Reference

(a) – (c) The 747 design includes the equipment necessary to support this requirement.

§ 91.219 Altitude Alerting System or Device; Turbojet Powered Civil Airplanes

(a) – (b) The 747's altitude alerting system design supports this requirement.

(c) – (d) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.

§ 91.221 Traffic Alert and Collision Avoidance System Equipment and Use

- (a) The 747 design meets this requirement.
- (b) The 747 design includes controls and displays necessary to support this requirement.

§ 91.223 Terrain Awareness and Warning System

- (a) The 747's design includes a Terrain Awareness Warning System (TAWS) that meets the requirements of this paragraph.
- (b) Not applicable to the 747 (manufactured after March 29, 2002).
- (c) The 747's Airplane Flight Manual complies with the requirements of this paragraph.

**Subpart D – Special Flight Operations
(None Applicable)**

Subpart E – Maintenance, Preventive Maintenance, and Alterations

§ 91.409 Inspections

- (a) – (h) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design. However, inspection requirements are documented in the Maintenance Planning Document delivered with the airplane.

§ 91.411 Altimeter System and Altitude Reporting Equipment Tests and Inspections

- (a) – (d) Initial altimeter system and altitude reporting equipment tests are made on the 747 airplane prior to delivery, which meets the relevant requirements of this paragraph.

§ 91.413 ATC Transponder Tests and Inspections

- (a) – (c) Initial transponder system and associated equipment tests are made on the 747 airplane prior to delivery, which meets the relevant requirements of this paragraph.

§ 91.415 Changes to Aircraft Inspections Programs

- (a)-(d) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.

Subpart F – Large and Turbine-Powered Multi-engine Airplanes

§ 91.503 Flying Equipment and Operating Information

- (a) Stowage provisions are included for the necessary flying publications, equipment, and charts required by this subparagraph.
- (b) – (c) Checklists meeting these requirements for normal and non-normal operation of the 747 is provided to the certificate holder.
- (d) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.

§ 91.507 Equipment Requirements: Over-the-Top or Night VFR Operations

The requirements of this paragraph are addressed by subparagraph § 91.205(d), above.

§ 91.509 Survival Equipment for Overwater Operations

(a) – (f) For overwater equipped 747, ditching equipment in accordance with this paragraph and § 25.1415 is provided. Life vests are provided and stowed in the captain and first officer seat back compartments.

§ 91.511 Radio Equipment for Overwater Operations

(a)(1) Qty (4) boom-microphone headsets are provided for both pilot and observers. Qty (2) interphone / aural warning speakers are also installed. A minimum of four independent receiver/transmitters are installed. Provisions for qty (3) hand microphones are provided for both pilots and the first observer.

(a)(2) – (b) The design of the 747's navigation system meets the requirements of these subparagraphs.

(c) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.

(d) The communication system design of the 747 meets the requirements of this subparagraph.

(f) The design of the 747's navigation system meets the requirements of this subparagraph.

§ 91.513 Emergency Equipment

(a)-(b) Stowage for emergency equipment on the 747 meets the requirements of this paragraph.

(c) Fire extinguishers are installed in compliance with this paragraph and § 25.851.

(d) First Aid Kits (number dependent on passenger count) are provided.

(e) A crash axe is installed in the flight deck.

(f) Two megaphones are provided in the passenger cabin.

§ 91.517 Passenger Information

(a) 747 design includes signs and controls compliant with this paragraph and § 25.791. The 747 design includes controls for the pilots to turn the FASTEN SEAT BELTS signs on and off. Baseline on 747 provides for control of NO SMOKING placards, with an option available for customers to select NO SMOKING signs to be installed hard wired on.

(b) This requirement does not apply to the 747 airplane because the airplane is equipped with all the necessary signs.

(c) – (e) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.

§ 91.519 Passenger Briefing

(a) – (d) These requirements are largely operational in nature; however, the 747 design supports operator compliance with the requirements of this paragraph.

§ 91.521 Shoulder Harness

(a) – (b) Flight crew and flight attendant combined seat belt and shoulder harness meet the requirements of § 25.785. Additionally, flight deck pilot seats, observer seats, and attendant seats comply with § 25.562 and thus meet these requirements.

§ 91.523 Carry-on Baggage

(a) – (b) The 747 carry-on baggage stowage areas are designed to be compliant with § 25.787 (which references § 25.561(b)).

§ 91.525 Carriage of Cargo

(a) The 747 is not designed to carry cargo other than in the cargo compartments, which are compliant with § 25.787.

(b) This requirement does not apply to the 747 airplane because the cargo compartments are not designed to require physical entry of the crewmember to extinguish any fire.

§ 91.527 Operating in Icing Conditions

(a) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.

(b) - (c) 747 ice protection provisions meet the requirements which allow operations defined in these paragraphs.

(d) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.

Subpart G – Additional Equipment and Operating Requirements for large and Transport Category Aircraft

§ 91.603 Aural Speed Warning Device

The 747 aural speed warning device design has been granted an equivalent safety finding for § 25.1303(c)(1).

§ 91.605 Transport Category Civil Airplane Weight Limitations

(a) This requirement does not apply to turbine-engine powered airplanes certificated after September 30, 1958.

(b)-(c) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design. However, the 747 Airplane Flight Manual provides sufficient information for the operator to conduct operations in accordance with these requirements.

§ 91.607 Emergency Exits for Airplanes Carrying Passengers for Hire

(a) – (b) These requirements are not applicable to the 747 since it will be certificated after 1957.

(c) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.

§ 91.609 Flight Recorders and Cockpit Voice Recorders

- (a) The 747 flight data recorder and cockpit voice recorder are designed to meet the requirements in §§ 25.1457 25.1459.
- (b) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.
- (c) – (d) The 747 flight data recorder is designed to meet all part 25, 91, 121, and 125 requirements and approved per the requirements of § 25.1459. The 747 flight data recorder uses a digital solid state recording medium and retains the last 25 hours of aircraft operation.
- (e) – (f) The 747 cockpit voice recorder was designed to meet all part 25, 91, 121 and 125 requirements and approved per the requirements of section § 25.1457.
- (g) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.

Subpart H – Foreign Aircraft Operations and Operations of U.S. Registered Civil Aircraft Outside of the United States

§ 91.705 Operations within the North Atlantic Minimum Navigation Performance Specifications Airspace

The navigation system of the 747 is designed to meet the MNPS requirements of part 91 Appendix C.

§ 91.706 Operations within Airspace Designed as Reduced Vertical Separation Minimum Airspace

(a) – (b) The air data system and crew displays of the 747 are designed to meet the RVSM requirements of part 91 Appendix G.

Appendix

A to 14 CFR Part 91: Category II and III Operations

- (1) The Airplane Flight Manual provided with the 747 contains information A to Category II and III approval and demonstrations.
- (2) The 747 design includes the instruments and equipment necessary to meet this requirement.
- (3) The 747's instruments and equipment will be approved for Category II and III operations upon delivery.
- (4) The maintenance program for Cat II systems will be the responsibility of the operator, and as such compliance is not directly dependent on the 747 design. However, some of the data required by this requirement are documented in the Maintenance Planning Document.

14 CFR PART 121

Subpart G – Manual Requirements

§ 121.141 Airplane or Rotorcraft Flight Manual

(a) The 747 will be supplied with an FAA-approved Airplane Flight Manual as required per section § 25.1581.

(b) This requirement is operational in nature; however, the 747 design supports the carriage of manuals by providing stowage in the flight deck.

Subpart H – Aircraft Requirements

§ 121.157 Aircraft Certification and Equipment Requirements

- (a) This section applies to aircraft certificated before June 1, 1942 and as such does not apply to the 747.
- (b) § 121.173(b) and (d) apply to the 747. Refer below for compliance with § 121.173(b) and (d).
- (c) – (f) These sections are not applicable to the 747 because they apply to C-46 type airplanes and non-transport category airplanes.
- (g) This requirement does not apply to the 747. (Appendix K applies to turbopropeller-powered airplanes).
- (h) The 747 will be type certificated under part 25.

§ 121.161 Airplane Limitations: Type of Route

- (a) The 747 design is intended for ETOPS certification.
- (b) The 747 design is intended for certification under part 25, including ditching provisions.
- (c) This paragraph does not apply to the 747 (applies to non-transport category airplanes not certificated under part 25).

Subpart I – Airplane Performance Operating Limitations

§ 121.173 General

- (a) This section applies to reciprocating engine aircraft and is not applicable to the 747.
- (b) This section requires compliance with sections § 121.189 through § 121.197 and is applicable to the 747. Refer below to entries for §§ 121.189 through 121.197 for specifics applicable to the 747.
- (d) This section requires compliance with §§ 121.175 through 121.197; §§ 121.175 through 121.187 apply to aircraft with reciprocating engines or four or more engines; §§ 121.189 through § 121.197 are applicable to the 747. Refer below to the §§ 121.189 through § 121.197 for specifics.
- (e) This section applies to reciprocating engine-powered airplanes and as such is not applicable to the 747.
- (f) This section describes deviation methods and as such is not applicable to the 747 design.
- (g) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.

§ 121.189 Transport Category Airplanes: Turbine Engine Powered: Takeoff Limitations

- (a) The 747 design and documentation in the Airplane Flight Manual provides the information necessary for operations to comply with this requirement.

- (b) This section applies to aircraft certified after August 26, 1957 and before August 30, 1959 and as such does not apply to the 747 design.
- (c) – (d) The 747 design and the Airplane Flight Manual provide the information necessary for operations to comply with these requirements.
- (e) The Airplane Flight Manual provides the information necessary for operations to comply with this requirement.
- (f) – (g) These sections provide definitions for determining compliance to this section.

§ 121.191 Transport Category Airplanes: Turbine Engine Powered: En Route Limitations: One Engine Inoperative

- (a) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design. However, the Airplane Flight Manual will provide the necessary performance information for operations to determine compliance with this requirement.
- (b) This section provides definitions for determining compliance to this section.

§ 121.195 Transport Category Airplanes: Turbine Engine Powered: Landing Limitations: Destination Airports

- (a) – (b) Though these requirements are operational in nature and not directly dependent on the 747 design, the Airplane Flight Manual will contain the information necessary for operations to comply with these requirements.
- (c) This section applies to turbopropeller powered airplanes and as such does not apply to the 747.
- (d) – (e) Though these requirements are operational in nature and not directly dependent on the 747 design, the Airplane Flight Manual will contain the information necessary for operations to comply with these requirements.

§ 121.197 Transport Category Airplanes: Turbine Engine Powered: Landing Limitations: Alternate Airports

Though this requirement is operational in nature and not directly dependent on 747 design, the Airplane Flight Manual will contain the information necessary for operations to comply with these requirements.

Subpart J – Special Airworthiness Requirements

§ 121.215 Cabin Interiors

- (a) – (e) Flight deck interior and passenger compartment materials and components comply with the applicable requirements of this paragraph and § 25.853.

§ 121.217 Internal Doors

Does not apply to the 747 flight deck door (no louvers or other ventilating means).

§ 121.219 Ventilation

The 747 environmental control system is designed to maintain carbon monoxide concentration in passenger & crew compartments in compliance with § 25.831. The 747 flight deck door has no louvers or other ventilating means.

§ 121.221 Fire Precautions

(a)- (f) Flight deck interior, passenger compartment, and cargo bay materials and components comply with the applicable requirements of this paragraph and §§ 25.853 and 25.855.

§ 121.263 Fire-Extinguishing Systems

(a) – (b) The 747 design is compliant with the requirements of this paragraph via §§ 25.1195 and 25.1201.

§ 121.273 Fire-Detector Systems

The 747 design is compliant with the requirements of this paragraph via § 25.1203.

§ 121.285 Carriage of Cargo in Passenger Compartments

(a)- (d) The 747 design is compliant with the requirements of this paragraph, §§ 25.787, and 25.789.

§ 121.287 Carriage of Cargo in Cargo Compartments

This requirement is not applicable since the 747 cargo compartments are not designed to require the physical entry of a crewmember to extinguish a fire (an integral cargo fire protection system is installed).

§ 121.289 Landing Gear: Aural Warning Device

(a) – (c) These requirements are not applicable to the 747 because it complies with the requirements of section § 25.729.

§ 121.291 Demonstration of Emergency Evacuation Procedures

(a) The 747 will demonstrate compliance with the requirements of § 25.803 during type certification. Per §121.291(a)(1), an additional demonstration is not required for this paragraph.

(b) – (c) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design. Compliance is the responsibility of the aircraft operator.

(d) – (e) Compliance with these requirements is the responsibility of the aircraft operator. The 747 is designed to comply with the ditching requirements in § 25.801.

**§ 121.305 Subpart K – Instruments and Equipment Requirements
Flight and Navigational Equipment**

(a) – (k) The 747 includes these required flight and navigational instruments and equipment.

§ 121.307 Engine Instruments

(a) – (c) 747 engine instrumentation is designed in accordance with § 25.1305(c) and does not have carburetor air, head temperature indications or fuel pressure indications for each engine.

(d) – (e) 747 engine and fuel system instrumentation design has the necessary displays to meet these requirements.

(f) This requirement is not applicable to the 747.

(g) – (k) 747 engine instrumentation design has the necessary displays to meet these requirements.

(l) This requirement addresses reversible propellers and is not applicable to the 747.

§ 121.308 Lavatory Fire Protection

(a) Each lavatory is equipped with a smoke detector system compliant with § 25.854(a) and thus meets this requirement.

(b) Each lavatory is equipped with a smoke detector system compliant with § 25.854(b) located in the waste container cabinet and thus meets this requirement.

(c) – (d) These requirements apply to aircraft with 30 or few passenger seats, and thus are not applicable to the 747.

§ 121.309 Emergency Equipment

(a) The 747 is designed to accommodate emergency equipment compliant with the requirements of this paragraph and § 121.310 as stated below. (b) Emergency equipment provided with the 747 complies with § 25.851 and 25.1411, and meets the design requirements of this paragraph.

(c) Water and Halon fire extinguishers compliant with §§ 25.851 and 25.1411 are located throughout the passenger cabin and flight deck. Requirement (c)(2) is not applicable to the 747 because the cargo compartment is not designed to be accessible to the crew during flight.

(e) A crash axe is installed in the flight deck.

(f) Two megaphones are provided in the passenger cabin.

§ 121.310 Additional Emergency Equipment

(a) Each passenger entry door emergency evacuation slide/raft and pneumatic door opening system contains an assisting means approved per section § 25.809. (note: there is no § 25.809(f)(1))

(b) Interior emergency exit markings are designed to meet requirements in this paragraph, §§ 25.811 and 25.812.

(c) Lighting for interior emergency exit markings is designed to meet the requirements of this paragraph and § 25.812.

(d) Emergency lighting on the 747 is designed to meet the requirements of this paragraph and § 25.812.

(e) Emergency exit operating handles are designed to meet the requirements of this paragraph and § 25.811(e) with the following caveat: The architecture of the 747 passenger door does not lend itself to show the full arc arrow representing the

travel of the door handle. The Boeing Company will demonstrate (1) that if the passenger door arrow was applied to meeting exactly the § 25.811(e)(4)(i)(ii), this would confuse door operation procedure, and (2) that the passenger door arrow designed for the 747 will meet the intent of § 25.811(e)(4)(i)(ii) with an interior compliance inspection.

(f) Access to emergency exits is designed to meet the requirements of this paragraph and § 25.813.

(g) Exterior exit markings are designed to meet the requirements of this paragraph and § 25.811(f).

(h) Exterior emergency lighting is designed to meet the requirements of this paragraph and § 25.812(g).

(i) Each of the passenger emergency exits is designed to meet the requirements in this paragraph and §§ 25.807-25.813.

(j) This requirement is not applicable to the 747 because there are no emergency exits in the passenger compartment in excess of the minimum required.

(k) This requirement is not applicable to the 747 because there are no ventral or tail cone exits in the passenger compartment.

(l) The 747's emergency exits are designed to be compliant with the requirements of §§ 25.809(i) and § 25.813(b)(6)(ii).

(m) The emergency exits of the 747 are designed to meet the requirements of this paragraph.

(n) The 747 cabin design includes flashlight stowage provisions accessible from each flight attendant seat.

§ 121.311 Seats, Safety Belts, and Shoulder Harnesses

(a) These requirements are operational in nature; however, the 747 passenger seats and safety belts are designed to meet the requirements of this paragraph and §§ 25.562 and 25.785.

(b) – (c) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.

(d) This requirement is not applicable to the 747 because there are no side-facing seats.

(e) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.

(f) – (g) The flight deck station and flight attendant seats fully comply with sections §§ 25.562 and 25.785.

(h) This requirement is operational in nature. However, pilot reach to controls with all belts fastened is designed to be compliant with section § 25.777(c).

(i) The flight deck seats include a stowage pocket for the buckle and shoulder harnesses that retract into the seat when not in use.

(j) All passenger and flight attendant seats on the 747 are designed to be compliant with the requirements of § 25.562.

§ 121.312 Materials for Compartment Interiors

(a) – (d) Materials in compartments used by crewmembers or passengers meet the requirements in section § 25.853.

(e) Thermal/acoustic insulation materials in the 747 design meet requirements of this paragraph and § 25.856.

§ 121.313 Miscellaneous Equipment

(a) This requirement is not applicable to the 747 because fuses are not installed on the airplane.

(b) A windshield wiper is installed for each pilot's front window.

(c) The power supply and distribution system is designed for compliance with the specified part 25 regulations.

(d) Displays do not operate without adequate power. EICAS messages alert the flight crew to electrical system faults and conditions when electrical buses are unpowered.

(e) There are three static pressure Air Data Modules (ADMs), each connected to two static ports, one on each side of the airplane. The Air Data Reference Function uses a voted static pressure value from the three ADM sources for to calculate trusted data for displays and other using systems. A manual selection to alternate airspeed and altitude sources is made by a rotary selector. The alternate position provides synthetic airspeed derived from AOA and inertial data, and GPS altitude. Amber annunciations are provided on the airspeed and altitude displays to indicate that alternate sources are displayed.

(f) The flight deck door between the passenger compartment and the flight deck is lockable and complies with § 25.772.

(g) – (h) These requirements are not applicable to the 747 because there is no door that is the means of access to a required passenger emergency exit.

(i) A means to unlock the lavatory doors is located outside each door, per § 25.820.

(j) The flight deck doors comply with § 25.795(a) (1) and (2). The crew rest compartment doors are located outside of the flight deck, and consequently are not required to comply with §§ 25.795 or 121.313(j).

§ 121.314 Cargo and Baggage Compartments

(a) – (b) Cargo and baggage compartment ceiling and sidewall liner panels are constructed of glass fiber reinforced resin and meet the test requirements of the specified Part 25 requirements.

(c) – (d) 747 compartments are designed to meet the standards of §§ 25.857 and 25.858.

§ 121.315 Cockpit Check Procedure

(a) This requirement is operational in nature, however, the 747 is furnished with cockpit Normal and Non-Normal Procedures as part of the Airplane Flight Manual, and Boeing Operations Manual supplied with the airplane.

(b) Normal and Non-Normal checklists are provided. Normal checklists are used to verify that certain critical procedural steps have been accomplished. Non-Normal Procedures are used by the flight crew to cope with non-normal situations, including engine and system emergencies.

(c) This requirement is operational in nature; however, the 747 design includes an electronic checklist as the primary means of access, and for backup paper copies a stowage slot for a normal checklist card is located under the glare shield, and stowage compartments for checklist manuals are outboard of each pilot seat.

§ 121.316 Fuel Tanks

The 747 meets the requirements specified in § 25.963(e).

§ 121.317 Passenger Information

(a) The 747 design is compliant with section § 25.791, and the passenger cabin signs are controlled by overhead panel selectors in the flight deck.

(b) – (c) These requirements are procedural in nature and as such compliance is not directly dependent on the 747 design.

(d) The 747 design is compliant with the requirements of this paragraph and section § 25.791.

(e) This placard is installed on the lavatory ceiling next to the smoke detector per § 25.1541.

(f) – (k) These requirements are procedural in nature and as such compliance is not directly dependent on the 747 design.

(l) This requirement applies to 747s manufactured before December 20, 1997.

§ 121.318 Public Address System

(a) The 747 design includes a public address system that meets the requirements of this paragraph. Operation of the PA system is independent from operation of the crew interphone system.

(b) The PA system is approved in accordance with § 21.305(c).

(c) The PA handset on the flight deck is located on the aft aisle stand between the two pilots. The pilots' audio control panels are located on the forward aisle stand. Reach to all flight deck controls is shown to be compliant to § 25.777c.

(d) The 747 complies with § 25.1423(g) and therefore meets this requirement.

(e) Operation of the PA can be accomplished within 3 seconds.

(f) The 747 complies with § 25.1423(c) and hence the PA system complies with this requirement.

(g) The PA system complies with § 25.1423.

§ 121.319 Crewmember Interphone System

(a) The crew interphone system operation is designed to meet the requirements of this paragraph.

(b) The crew interphone system was approved in accordance with § 21.305(c) and meets the additional requirements of this subparagraph.

§ 121.323 Instruments and Equipment for Operations at Night

(a) The 747 is equipped with position lights.

(b) A red strobe anti-collision light is located on the top and bottom of the fuselage.

(c) Four landing lights are located in each wing root and two turnoff lights are located on the nose gear. The orientation of each light is designed to ensure sufficient beam spread during approach, flare, and ground roll.

(d) The 747 is equipped with lighting controls for all displays and panels. In addition, the main displays will have automatic and manual brightness controls. Anti-reflective coatings are used to reduce reflections and glare off the displays. Instrument lighting reflections, and illumination intensity controls comply with § 25.1381.

(e) Airspeed is provided to the primary displays by the Air Data Reference Function which is hosted in the Flight Control Electronics. Pitot heat is provided.

(f) Altitude is provided to the primary displays by the Air Data Reference Function which is hosted in the Flight Control Electronics.

§ 121.325 Instruments and Equipment for Operations under IFR Over-the-Top

(a) See response to § 121.323(e) for compliance statement.

(b) See response to § 121.323(f) for compliance statement.

(c) See response to § 121.323(d) for compliance statement.

§ 121.329 Supplemental Oxygen for Sustenance: Turbine Engine Powered Airplanes

(a) – (c) Oxygen systems compliant with §§ 25.1441, 25.1443, 25.1445, and 25.1447 is provided for emergency supplemental oxygen use. The systems can be operated in accordance with § 121.329.

§ 121.333 Supplemental Oxygen for Emergency Descent and for First Aid; Turbine Engine Powered Airplanes with Pressurized Cabins

(a) An oxygen system compliant with §§ 25.1441, 25.1443 (25.1443(c) via Equivalent Safety Finding), 25.1445, and 25.1447 is provided. See response to (b) through (e).

(b) Two hours worth of oxygen are provided to meet this requirement.

(c) Flight Crew oxygen masks are provided that allows the operator to comply with this operational requirement.

(d) Portable oxygen equipment is installed for each attendant (per § 25.1447(c)(4)). While attendants are between attendants' seat locations, oxygen is available from the additional oxygen masks installed (vs. number of passenger seats) at the Passenger Service Units (per § 25.1447(c)(1)).

(e) Twelve minutes of passenger oxygen is available as basic equipment to meet this requirement.

(f) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.

§ 121.335 Equipment Standards

(a) This requirement is for reciprocating engine powered airplanes and does not apply to the 747.

(b) The oxygen system will meet the equipment standard of Section 4b.651 of the Civil Air Regulations by Equivalent Safety Finding to § 25.1443(c).

- § 121.337 Protective Breathing Equipment**
(a) – (b) Protective breathing equipment is provided that is compliant with this paragraph and § 25.1439.
(c) This requirement is procedural in nature and as such compliance is not directly dependent on the 747 design.
- § 121.339 Emergency Equipment for Extended Over-Water Operations**
(a) The 747 design complies with § 25.1415 and includes a life preserver equipped with a survivor locator light for each occupant of the airplane, slide/raft to cover rated capacity, a flare for each raft, and an ELT.
(b) Emergency equipment is readily accessible, as required for compliance with § 25.1411.
(c) A survival kit is contained within each slide/raft unit.
- § 121.340 Emergency Flotation Means**
(a) Life vests compliant with § 25.1415 are provided for overwater configurations of the 747. Life vests are provided and stowed in the captain and first officer seat back compartments.
(b) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.
- § 121.341 Equipment for Operations in Icing Conditions**
(a) The 747 provides for the prevention /removal of ice with pneumatic ice protection system for the wings, pneumatic ice protection system for the engines, and electrical heating for flight deck windows and air data probes.
(b) The 747 provides a Primary Ice Detection system which is operable in flight during all day/night lighting conditions. The PIDs detects icing conditions and automatically activates the wing ice protection system. The 747 also provides wing lights installed on the fuselage to illuminate the leading edge of the wing, and it was shown by analysis that no glare or reflection would handicap crewmembers in the performance or their duties.
(c) These requirements are for non-transport category airplanes and thus do not apply to the 747.
(d) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.
- § 121.342 Pitot Heat Indication System**
The 747 complies with section § 25.1326 and provides caution level EICAS alerts for failure of one or more pitot probe heat systems.
- § 121.343 Flight Recorders**
(a) The 747 flight data recorder was designed and tested to meet all part 25, 91, 121, and 125 requirements and approved per the requirements of section § 25.1459.
(b) These requirements do not apply to the 747 since it was not certificated before 1969.

(c) The 747 flight data recorder uses a digital solid state recording medium and is compliant with section § 121.344.

(d) – (f) The 747 flight data recorder was designed and tested to meet all part 25, 91, 121, and 125 requirements and approved the requirements of section § 25.1459.

(g) The design of the 747 flight recorder enables operators to comply with this requirement by automatically recording data from start of preflight checklist to end of flight checklist.

(h) – (i) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.

(j) – (l) The 747 flight data recorder was designed and tested to meet all part 25, 91, 121, and 125 requirements and approved per the requirements of section § 25.1459.

§ 121.344 Digital Flight Data Recorders for Transport Category Airplanes

(a)-(b) The 747 flight data recorder was designed and tested to meet all part 25, 91, 121, and 125 requirements and approved per the requirements of section § 25.1459.

(c) The requirements of this paragraph apply to the 747s manufactured before October 11, 1991.

(d)- (g) The 747 flight recorder is designed to meet the requirements of this paragraph.

(h) – (i) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.

(j) – (l) The 747 flight data recorder was designed and tested to meet all part 25, 91, 121, and 125 requirements and approved per the requirements of section § 25.1459.

§ 121.345 Radio Equipment

(a) The 747 has three VHF radios and two HF radios, plus SATCOM for ETOPS flights greater than 180 min.

(b) All radio systems have separate antenna installations except HF radios which share a rigid antenna.

(c) Specified aircraft ATC equipment is classified as mode S.

§ 121.347 Radio Equipment for Operations under VFR over Routes Navigated by Pilotage

(a) The 747 design includes radio equipment capable of communicating with appropriate ground stations or traffic control facilities, while simultaneously receiving meteorological information at any point along the route.

(b) Onboard ADF, VOR, GPS, and DME systems are designed to receive navigational signals independently of the communications radios.

§ 121.349 Radio Equipment for Operations under VFR over Routes Not Navigated by Pilotage or for Operations under IFR or Over-the-Top

- (a) All communication devices mentioned in section § 121.347(a) are still active for this condition. Dual redundant VOR/ILS, DME, and marker beacon receivers are installed.
- (b) Two VORs are installed, and the design makes provisions for two ADFs if the operator requires them.
- (c) Redundant DME receivers are installed.
- (d) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.
- (e) This requirement does not apply to the 747 since it has more than 30 seats.

§ 121.351 Radio Equipment for Extended Overwater Operations and for certain others Operations

- (a) – (b) The 747 is equipped with the radio equipment necessary to comply with the requirements of this paragraph, §§ 121.347 and 121.349.
- (c) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.

§ 121.353 Emergency Equipment for Operations over Uninhabited Terrain Areas: Flag and Supplemental Air Carriers and Commercial Carriers

- (a) Each slide/raft contains a pyrotechnic signaling device.
- (b) There is one survival type emergency locator transmitter furnished with the 747.
- (c) Survival kits are provided.

§ 121.355 Equipment for operations on which Specialized Means of Navigation are Used

- (a) The ERS (Earth Reference System) is certified to meet the requirements of part 121Appendix G.
- (b) This requirement is not applicable since the ERS (Earth Reference System) was not certificated prior to 1972.

§ 121.356 Traffic Alert and Collision Avoidance Equipment Requirements

- (a) The 747 is equipped with dual approved TCAS II systems (compliant with TSO-C119b) and Mode S transponders (compliant with TSO-C112).
- (b) This requirement is not applicable to the 747 since it has more than 30 seats.
- (c) This requirement is not applicable to the 747 since it is turbine powered.

§ 121.357 Airborne Weather Radar Equipment Requirements

- (a) The 747 is equipped with a weather radar system that complies with all applicable sections part 25. The weather radar system is qualified to TSO-C63c.
- (c) – (d) These requirements are operational in nature and as such compliance is not directly dependent on the 747design.
- (e) The 747 weather radar design complies with this requirement.

§ 121.358 Low-altitude Windshear Equipment Requirements

- (a) The 747 is equipped with an approved airborne windshear warning system.

(b) – (d) These requirements are applicable to 747s manufactured before January 3, 1991.

§ 121.359 Cockpit Voice Recorders

(a) The 747 cockpit voice recorder was designed and tested to meet all part 25, 91, 121, and 125 requirements and approved per the requirements of § 25.1457.

(c) The 747 cockpit voice recorder was designed and tested to meet all part 25, 91, 121, and 125 requirements and approved per the requirements of § 25.1457.

(d) This requirement does not apply to the 747 because it has more than 19 seats.

(e) This requirement does not apply to the 747 because it has more than 30 seats.

(f) The 747 uses a CVR that provides a continuous record of the last two hours of communications and conversation.

(g) – (h) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.

§ 121.360 Ground Proximity Warning/Glideslope Deviation Alerting System

(a) The 747 is equipped with a ground proximity warning system that is compliant with TSO-C92c.

(b) This information is contained in the 747 Operations Manual.

(c) – (d) These requirements are operational in nature and as such compliance is not dependent on the 747 design.

(e) The 747 is equipped with a ground proximity warning glide slope deviation alerting system that meets the requirements of, and is approved under, TSO-C92c.

(f) The ground proximity warning glide slope deviation alerting system meets these requirements.

§ 121.369 Subpart L – Maintenance, Preventive Maintenance, and Alternations Manual Requirements

(a) – (c) These requirements apply to manuals developed by the operator and as such compliance is not directly dependent on the 747 design.

§ 121.574 Subpart T – Flight Operations Oxygen for Medical Use by Passengers

(a) – (d) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.

§ 121.576 Retention of Items of Mass in Passenger and Crew Compartments

The 747 is designed to comply with the requirements in §§ 25.787 and 25.789. Suitcase stowage for the flight crew is provided in multiple places on the flight deck.

§ 121.577 Food and Beverage Service Equipment during Takeoff and Landing

(a) – (e) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design. The 747 design includes provisions for stowage of the items listed in this paragraph.

- § 121.578 Cabin Ozone Concentration**
(a) This paragraph provides definitions for subsequent paragraphs.
(b) – (c) The 747 will gain approval per the cabin ozone concentration requirements of § 25.832.
(d) – (e) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.
- § 121.581 Forward Observer’s Seat; Enroute Inspections**
(a) The first observer’s seat installed on the 747 flight deck is suitable for conducting enroute inspections.
(b) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.
(c) This requirement applies to 747s certificated before December 20, 1995.
- § 121.587 Closing and Locking of Flight Crew Compartment Door**
(a) – (b) These requirements are operational in nature and as such compliance is not directly dependent on the 747 flight deck door is lockable in accordance with § 121.313.
- § 121.589 Carry-on Baggage**
(a) – (e) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design. Passenger compartment stowage areas are designed for compliance with all applicable requirements part 25, 91, 121, and 125.
(f) The 747 passenger seats are approved per the requirements in §§ 25.787 and 25.789.
(g) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.

PART 125

- Subpart C – Manual Requirements**
- § 125.75 Airplane Flight Manual**
(a) This requirement is operational in nature, however, the 747 is furnished with an FAA-approved Airplane Flight Manual as required per § 25.1581.
(b) This requirement is operational in nature; however, the 747 design supports the carriage of manuals by providing stowage in the flight deck.
- Subpart D – Airplane Requirements**
- § 125.93 Airplane Limitations**
The 747 is designed for compliance with the ditching-related requirements in part 25, 91, 121, and 125. The Boeing Operations Manual includes a DITCHING Non-Normal Procedure.
- Subpart E – Special Airworthiness Requirements**
- § 125.183 Carriage of Cargo in Passenger Compartments**

(a) – (c) These requirements are largely operational in nature; however, the design of the stowage compartments per §§ 25.787 and 25.798 allows operators to be in compliance with this paragraph.

§ 125.185 Carriage of Cargo in Cargo Compartments

This requirement is not applicable to the 747. All cargo compartment fire extinguishers are controlled by switches on the Cargo Fire Panel on the flight deck.

§ 125.187 Landing Gear: Aural Warning Device

(a) – (c) The exception to these requirements in paragraph (a) applies to the 747 because it complies with the requirements of § 25.729.

§ 125.189 Demonstration of Emergency Evacuation Procedures

(a) – (b) The 747 will demonstrate compliance with § 25.803(c). An additional demonstration in support of this paragraph is not required, per § 125.189(d).

(c) – (d) These requirements are airline dependent and not directly dependent on airplane design. The 747 is designed for compliance with § 25.801 (ditching).

Subpart F – Instrument and Equipment Requirements

§ 125.203 Radio and Navigational Equipment

(a) Three independent VHF radios provide two-way radio communications up to a line of sight distance to the horizon.

(b) Over-the-top operations on the 747 can be supported by the following 2 VOR/ILS systems and 2 DME systems.

(c) The 747 contains the following radio communication and navigational equipment to support this requirement: 2 independent HF radios, 2 speakers, 4 jacks for microphone-headsets, and provisions for 3 microphone jacks, a marker beacon receiver (within the left VOR Receiver), and two independent VOR systems.

(d) The dual HF radios are independent.

(e) This requirement is procedural in nature and not dependent on airplane design.

§ 125.205 Equipment Requirements: Airplanes under IFR

(a) Vertical speed is indicated on the right hand side of each pilot's primary flight display.

(b) Total air temperature is indicated on the EICAS display.

(c) The air data reference system relies on three heated pitot probes.

(d) Displayed attitude is provided by data from the Flight Control Electronics. It is based on voted values of pitch and roll from the 4 inertial measurement units in the ERS. Any loss of power or loss of attitude output to the primary displays is alerted to the flight crew by failure flags on the PFD and by EICAS messages.

(e) Three air data modules (ADM) connected to three sets of static ports serve as the sources of static pressure for the flight displays. All three sources are used to provide voted airspeed and altitude for display. If the voted static pressure

is not available, an airspeed calculated from the AOA is displayed. Flags on the PFDs and EICAS message alert the crew to this failure.

(f) One Variable Frequency Generator is installed on each engine. Any two of these generators are rated sufficiently to power all the loads necessary for safe emergency operation.

(h) This definition is consistent with compliance to paragraph (f).

(i) The air data reference system relies on three heated pitot probes to provide reliable airspeed.

(j) Barometric pressure is sensed by three sets of static pressure ports connected to three air data modules. The static pressure from all three static ADMs is used by the Air Data Reference Functions to provide voted, trusted altitude for the primary altitude displays. The Center Static ADM provides the altitude displayed on the Integrated Standby Flight Display (ISFD).

(k) Instrument lighting, reflections, and illumination intensity controls comply with § 25.1381.

§ 125.206 Pitot Heat Indication Systems

(a) The 747 complies with § 25.1326.

(b) This requirement is not applicable to the 747 because it complies with (a).

§ 125.207 Emergency Equipment Requirements

(a) First aid kits (number dependent on passenger count) are provided in the passenger cabin. A crash axe is located in the flight deck. Passenger signs compliant with § 25.791, controlled by overhead panel selectors in the flight deck, are incorporated. The 747 includes provisions for the additional emergency equipment specified in Appendix A to part 121 and 125.

(b) Two megaphones are installed in the passenger cabin.

§ 125.209 Emergency Equipment: Extended Overwater Operations

(a) Life preservers and rafts compliant with § 25.1415 are provided.

(b) This requirement is mainly operational in nature, however, the design of the 747 allows for equipping overwater 747s with a survival-type emergency locator transmitter.

§ 125.211 Seat and Safety Belts

(a) These requirements are mainly operational in nature; however, the 747 passenger seats and safety belts are approved per §§ 25.561, 25.562, and 25.785.

(b) – (c) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.

(d) This requirement is not applicable to the 747 because there are no side-facing seats.

(e) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.

(f) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design. Flight deck and flight attendant seats are

equipped with shoulder harnesses in accordance with §§ 25.785(g) and 25.785(h)(6), respectively.

§ 125.213 Miscellaneous Equipment

(a) This requirement is not applicable to the 747 because fuses are not installed on the airplane.

(b) A windshield wiper is installed for each pilot's front window.

(c) The power supply and distribution system has been shown compliant with the specified part 25 regulations.

(d) Displays do not operate without adequate power. EICAS messages alert the flight crew to electrical system faults and conditions when electrical buses are unpowered.

(e) There are three static pressure ADMs each connected to two static ports, one on each side of the airplane. The Air Data Reference Function uses a voted static pressure value from the three ADM sources for to calculate trusted data for displays and other using systems. A manual selection to alternate airspeed and altitude sources is made by a rotary selector. Amber annunciations are provided on the airspeed and altitude displays to indicate that alternate sources are displayed.

(f) This requirement is not applicable to the 747 because there is no door that is the means of access to a required passenger emergency exit.

(g) A means to unlock lavatory doors is located outside each door per § 25.820.

§ 125.215 Operating Information Required

(a) These requirements are operational in nature; however the 747 is furnished with cockpit Normal Procedures, Non-Normal Procedures, and engine inoperative performance data as part of the Ops Manual and Airplane /Flight Manual, respectively. Flight deck stowage for the flight kit, QRH, flight manual, and logbook is provided outboard of the captain and first officer seats.

(b) The 747 Normal Procedures checklist contains the procedures to meet this requirement.

(c) The 747 Non-Normal Procedures contain the categories of procedures specified in this requirement.

§ 125.217 Passenger Information

(a) The 747 is compliant with § 25.791, and the passenger cabin signs are controlled by aisle stand panel controls in the flight deck.

(b) – (d) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.

§ 125.219 Oxygen for Medical Use by Passengers

(a) – (e) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.

§ 125.221 Icing Conditions: Operating Limitations

- (a) – (b) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.
- (c) – (d) The 747 design complies with the part 25 requirements relating to ice protection.
- (e) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.

§ 125.223 Airborne Weather Radar Equipment Requirements

- (a) The 747 is equipped with a weather radar system that complies with all applicable sections of part 25. The weather radar system is qualified to TSO-C63c.
- (b) – (d) These requirements are operational in nature and as such compliance is not dependent on the 747 design.
- (e) The 747 aircraft weather radar installation design complies.

§ 125.224 Traffic Alert and Collision Avoidance System

- (a) The 747 is equipped with an approved TCAS II system and the appropriate Mode S transponder.
- (b) Information as to procedures and input sources required for the TCAS to function properly are provided in the manuals (Flight Manual and Wiring Diagram Manual, respectively) as required by § 125.71.

§ 125.225 Flight Recorders

- (a) This requirement is not applicable to the 747 because it was certificated after October 1969.
- (b) – (c) These requirements are not applicable to the 747 because the more restrictive requirement (d) is applicable (see below).
- (d) The 747 flight data recorder was designed and tested to meet all part, 25, 91, 121, and 125 requirements and approved per the requirements of § 25.1459.
- (e) – (g) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.
- (h) – (i) The 747 flight data recorder was designed and tested to meet all part 25, 91, 121, and 125 requirements and approved per the requirements of § 25.1459, which includes the requirement for an underwater locating device.

§ 125.227 Cockpit Voice Recorders

- (a) A cockpit voice recorder designed and tested to meet all part 25, 91, 121, and 125 requirements and approved per the requirements of § 25.1457 is installed in the 747. The CVR will automatically record data from start of preflight checklist to end of flight checklist.
- (b) This requirement is operational in nature and as such compliance is not directly dependent on the 747 design.
- (c) – (d) The 747 cockpit voice recorder was designed and tested to meet all part 25, 91, 121, and 125 requirements and approved per the requirements of § 25.1457.

(e) – (f) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.

Subpart G – Maintenance

§ 125.249 Maintenance Manual Requirements

(a) – (b) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.

Subpart H – Airman and Crewmember Requirements

§ 125.269 Flight Attendants

(a) – (c) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.

Subpart J – Flight Operations

§ 125.327 Briefing of Passengers before Flight

(a) – (e) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.

§ 125.329 Minimum Altitudes for Use of Autopilot

(a) - (c) For takeoff, the autoflight system is prohibited from being engaged prior to 200ft RA. For approach, the Airplane Flight Manual provides operating limitations for operational compliance.

(d) – (e) These requirements are operational in nature and as such compliance is not directly dependent on the 747 design.

MISCELLANEOUS

a. ADVISORY CIRCULARS

1) AC 20-130 and AC 90-45A - Area Navigation/Multi Sensor Navigation Systems in US NAS - Meets or exceeds all requirements for enroute or approach area navigation systems. Aircraft may file “/G” flight plan suffix for pertinent routes.

2) AC 91-6A - Water, Slush, and Snow on Runway - Aircraft systems and procedures are consistent with this AC.

3) AC 91-53A - Noise Abatement Departure Profile - Aircraft systems and procedures are consistent with this AC. Both U.S. and ICAO A and B procedures may be flown by appropriate FMS data entries.

4) AC 120-28D - Category III - AFM provisions address Category III requirements. Cat IIIb minima are based on fail operational autoland ("LAND 3" mode). Fail passive autoland ("LAND 2" mode) is limited to Cat IIIa. Irregular terrain clearance (Case I) demonstrations have been successfully completed for the B-747 (KSEA).

- 5) AC 120-29A - Category II - Aircraft systems and procedures are consistent with this AC. AFM and MMEL include reference to configurations approved, as addressed by standard operations specifications.
- 6) AC 120-33 - Navigation Systems For Approval in MNPS - Aircraft systems and procedures are consistent with this AC.
- 7) AC 120-35A - LOFT - Aircraft systems and procedures, and training, checking, and currency identified by the FSB are consistent with this AC. Specific provisions related to LOFT are addressed by paragraph 6.5.1 of this report.
- 8) AC 120-38 - Cabin Ozone Concentrations - B-747 systems and procedures are consistent with this AC and qualified for operations in areas of high ozone concentration without special flight procedure.
- 9) AC 120-64 - Operational Use and Modifications of Electronic Checklists (ECLs) - Aircraft systems and procedures are consistent with this AC. A current paper backup to the ECL must be carried on board and be readily accessible to the crew.

b. FAA DIRECTIVES, POLICIES, AND US AIRMAN'S INFORMATION MANUAL

- 1) The B-747 is considered a "Heavy" aircraft and flight plans should be so designated.
- 2) For the B-747, airspeeds in excess of US standard limits (greater than 250 KIAS below 10,000 MSL) may require routine crew advisories to ATC regarding deviation from speed limits when operating at heavy gross weights.
- 3) Flight Plan designator is B-747. No unique air traffic requirements are applicable to the B-747.

APPENDIX 4

EXAMPLE FULL TRANSITION COURSE FOOTPRINT

Flight Training Curriculum

B-747-4, B-747-8 Transition Footprint (14 CFR §121.424 Appendix E)

From all non-FMS flight decks (full transition)

CBT/Academics, Performance, and Exam. 10 CBT/FTD/FPT 13 days	FFS 8 FFS	FFS 1 FFS Ck 9days
22 days total		

APPENDIX 5

EXAMPLE DIFFERENCES COURSE

Flight Training Curriculum

B-747-8 Differences Footprint (14 CFR § 121.424 Appendix E)

From B-747-4 to B-747-8

CBT/Academics, Performance, and Exam. 1 Day	FTD Level 4 2 Days	Checking Differences Course Completion
3days total		

Note: The B-747-8 differences curriculum requires the pilot to be current and qualified in the B-747-4 with a current proficiency check as specified in § 61.58.

APPENDIX 6

EXAMPLE SHORTENED TRANSITION FOOTPRINT

Flight Training Curriculum

B-747-4, B-747-8 Shortened Transition Footprint
(14 CFR § 121.424 Appendix E)

From all other Boeing FMS flight decks (shortened transition)

CBT/Academics, Performance, and Exam. 10 CBT/ FTD/FPT	FFS 7 FFS	FFS 1 FFS Check
8 Days	8 Days	
16 Days total		

APPENDIX 7

EXAMPLE FLIGHT ATTENDANT TRAINING

B-747 Flight Attendant Transition Training (14 CFR § 121.421)

The training modules addressed in the B-747 training program are considered to reflect the minimum training requirements for an emergency evacuation of the B-747 aircraft. In addition, these training modules were designed to train to the minimum evacuation performance standards required for optimum flight attendant performance proficiency when evacuating the B-747 aircraft. When approving B-747 training programs, the FAA must consider the category of training to be addressed, the complexity of the different related aircrafts of the B-747 aircraft, and the complexity of the type of operation to be conducted.

1. B-747 Aircraft Familiarization and Systems Orientation
 - Aircraft characteristics and description including cabin configuration
 - Description of the function and operation of the flight attendant jumpseat restraint system
 - Description and location of emergency exits
 - Door opening controls and indicators
 - Arming and disarming of emergency evacuation system
 - Door operating procedures in the normal mode
 - Door operating procedures in the emergency mode including slide/raft deployment
 - Description of the emergency communication and lighting systems
2. B-747 Flight Attendant-Evacuation Responsibilities
 - Flight attendant numbering system and duty stations
 - Flight attendant jumpseat restraint system and protective position at jumpseat
 - Switches and controls to be used at assigned station
 - Exit assignment(s) including where and how to assess conditions outside the aircraft
 - Operation of exit controls including location of manual inflation handle
 - Protective position at exit and dedicated assist space
 - Evacuation commands and actions
 - Helper requirements
3. B-747 Evacuation Procedures
 - Flight attendant readiness including assuming protective position
 - Maintaining brace position until aircraft comes to a complete stop
 - Releasing seatbelt and getting out of seat
 - Assessing conditions
 - Decision to evacuate and initiation of evacuation
 - Ensuring activation of emergency lights

- Commanding passengers to release seatbelts and evacuate
- Assessing exit condition while commanding passengers to stand back
- IF EXIT IS USABLE: opening of exit and assuming protective position in dedicated assist space.
 - **NOTE:** One area of training that needs to be emphasized in respect to an inoperative or blocked door is redirecting passengers in a positive and persuasive manner to an operative door. This would maximize the flow rates to an operative door which would aid in reducing the evacuation times.
- Pulling manual inflation handle
- Commanding passengers to stand back until slide/raft fully deployed
- Commanding passengers to evacuate at exit and run away from aircraft
- Continuing to assess conditions inside and outside the aircraft to ensure passenger flow is maintained
- Taking appropriate action to assist hesitant passengers
- When passenger flow has ceased at exit, taking appropriate actions to assist and redirect passengers at adjacent exit(s)
- Exiting aircraft following last passenger, using nearest exit
- IF EXIT NOT USABLE: blocking exit to prevent passenger egress while commanding passengers that exit is blocked
- Assessing usability of other doors in vicinity
- Visually determining that passenger flow has been established through a usable exit before re-directing passenger flow
- Directing passengers to nearest usable exit by issuing appropriate commands and using arms and hands to point passengers in direction of exit
- When in flight attendant's best judgment, passenger flow has been established away from a non usable exit and toward a usable exit, proceeding to appropriate location to best direct passengers to active exits
- Maintaining awareness of evacuation progress at other usable exits and directing (or redirecting) passengers as necessary to maintain equal flow to each exit
- FLIGHT ATTENDANTS NOT ASSIGNED TO AN EXIT: flight attendant readiness including assuming protective position
- Maintaining brace position until aircraft comes to a complete stop
- Releasing seatbelt and getting out of seat
- Assessing conditions and directing passengers to usable exits

4. Door Training

- INSTRUCTOR DEMONSTRATION: normal opening/closing, including use of gust lock
- Arming and disarming of emergency evacuation system including visual indicators
- Assessing conditions
- Emergency door operation including pulling of manual inflation handle
- Assuming protective position

- ALL FLIGHT ATTENDANTS PERFORM: one time arming and disarming of emergency evacuation system
- Verbal review of evacuation protocol
- Evacuation protocol including one successful opening of the door in the armed mode and one successful opening of the door in the emergency mode (average five minutes per trainee)

APPENDIX 8

REQUIREMENTS FOR THE 747-8 DIFFERENCES COURSE

SUMMARY

The Flat Panel Trainer flight profile includes those procedures and representative maneuvers that are different between the 747-4 and the 747-8. The specific maneuvers, sequence of events and the Non-Normal Procedures used may be modified at the discretion of the check pilot.

PREFLIGHT

Preflight
Electronic Checklist
Engine start
Start malfunction
Takeoff checks

TAKEOFF

Normal takeoff
Instrument takeoff
Departure procedures

APPROACH PROCEDURES

Electronic Checklist
STAR/FMS procedures
Auto-pilot flown ILS approach
IAN Non-ILS approaches
Missed approach

LANDING

Full stop
Rejected landing

NON-NORMAL PROCEDURES

Select at least one of the following:
Generator Failure
Engine Failure
Hydraulic Failure

TAXI IN

After landing procedure
Parking, shutdown, and secure