EUROPEAN AVIATION SAFETY AGENCY

Operational Evaluation Board Report

Boeing 787 - 8
Report of the FCL/OPS Subgroup

Revision 2
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Boeing B787-8

Operational Evaluation Board (OEB)

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Revision Record

Rev. No.	Content	Date
First Issue	New Evaluation	28 November 2011
Revision 1	B787 to B777 Differences Course and CTLC provisions added	11 July 2012
Revision 2	B747 to B787 Type Rating course with credit for prior experience added	26 September 2012

Contents

Acronyms

AFM ..... Airplane Flight Manual
AOC ..... Air Operator Certificate
AP ..... Autopilot
AT ..... Auto Throttle
ATO ..... Approved Training Organisation
AWO ..... All Weather Operations
CBT ..... Computer Based Training
CPD ..... Common Procedures Document for conducting Operational Evaluation Boards, dated 10 June 2004
CTLC ..... Common Take-off and Landing Credit
Draft CS FCD..... EASA Notice of Proposed Amendment (NPA) 2012-05, dated 6 July 2012 'Certification Specifications for Flight Crew Data (CS FCD)
EFB ..... Electronic Flight Bag
FCOM ..... Flight Crew Operating Manual
FFS ..... Full Flight Simulator (Level C/D)
FMS ..... Flight Management System
FPT ..... Flat Panel Trainer
FSTD ..... Flight Simulation Training Device
GPS ..... Global Positioning System
HUD ..... Head-up Display
IAN ..... Integrated Approach Navigation
LBS ..... Load & Balance and Servicing
MDR ..... Master Differences Requirements
MFF ..... Mixed Fleet Flying
MMEL ..... Master Minimum Equipment List
ODR ..... Operator Differences Requirements
OPT ..... Operational Performance Tool
OTD……..Other Training Device
Part-FCL ..... Commission Regulation (EU) No 1178/2011 of 3 November 2011 laying down technical requirements and administrative procedures related to civil aviation aircrew pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council.
PIC ..... Pilot In Command
PF ..... Pilot Flying
PM ..... Pilot Monitoring
QRH ..... Quick Reference Handbook
SMS ..... Safety Management System
TAC ..... Thrust Asymmetry Compensation
TASE ..... Training Areas of Special Emphasis
TRTO ..... Type Rating Training Organization

Terminology

Currency means the experience necessary for the safe operation of aircraft, equipment and systems.

Recent experience means the recent experience described in Part-FCL and EU-OPS.

Preamble

This Operational Evaluation was conducted jointly by the US Federal Aviation Administration (FAA), the European Aviation Safety Agency (EASA), and Transport Canada Civil Aviation (TCCA) to simultaneously meet the FAA requirements for a Flight Standardization Board (FSB) report, the EASA requirements for the OEB report, and the Canadian requirements for an Operational Evaluation of the Boeing B787-8.

The scope of the initial evaluation comprised the license endorsement designation, full type rating course, reduced pilot training courses based on commonality for the B737 300-900 aircraft and for the B757/767, differences course from the B777, operational suitability and compliance with Subparts K & L of EU-OPS.

In further evaluations the pilot differences course B787-8 to B777, Common Take-off and Landing Credits, and reduced pilot training based on commonality for the B747 aircraft were evaluated.

Each Authority uses the results of the evaluation process to produce a report specific to its particular requirements that, while similar in intent, may differ in detail. This OEB report is applicable to operations under the framework of EASA.

Emanating from these evaluations, this report specifies the EASA recommendations for training checking and currency requirements of the B787-8, as specified in Part-FCL and EU-OPS. This report also contains findings of operational suitability and compliance with Subparts K & L of EU-OPS.

The OEB recommends the approval of:

- Boeing referenced ODR tables;
- Boeing proposed initial pilot type rating training course for the B787-8;
- Boeing proposed pilot differences training courses:
  - from the B777 to the B787-8; and
  - from the B787-8 to the B777;
- Boeing proposed reduced pilot training courses based on commonality between the following aircraft types:
  - B737 300-900 with EFIS/PFD-ND and FMS to the B787-8;
  - B747-400 / -8 to the B787-8; and
  - B757/767 to the B787-8;

The OEB recommends a single licence endorsement "**B777/787**" for the B777 series and the B787-8.

The OEB further recommends the included conditions for operations on more than one type or variant with reference to Part-FCL and EU-OPS.

These Operational Evaluations were conducted in accordance with the EASA OEB Handbook, the CPD, and applicable JAR-FCL 1 / Part-FCL and EU-OPS requirements. Determinations made in

this report are based on the evaluations of specific B777 and B787 aircraft models equipped in a given configuration and in accordance with current regulations and guidance. Modifications and upgrades made to the models described herein, or introduction of other variants may require amendment of the contents of this report.

OEB B787-8 FCL/OPS Subgroup Composition

Name	Capacity	Task
Ian Belmore [8)]	EASA	Team Member
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Roman Marushko	TCCA	OEB Chairman
Thomas Smyth	TCCA	Team Member

1) T2 B787-8 aircraft flight test (18 May 2010)
2) T3 B777 to B787-8 differences training course (4 - 8 Jul 2010)
3) T5 B737 ^ B757&767 to B787-8 reduced pilot type rating training course (17 Jun - 3 Jul 2010)
4) T5 B787-8 initial pilot type rating training course (27 May - 24 Jun 2010)
5) B787-8 operational suitability flight tests (5 - 8 Aug 2011)
6) T3 B787-8 to B777 differences training course (31 Jan - 10 Feb 2012)
7) T6 CTLC evaluation (25 - 27 Apr 2012)
8) T5 B747 to B787-8 reduced pilot type rating training course (20 Aug - 14 Sep 2012)

Executive Summary

1. Scope of the evaluation

This report specifies the EASA pilot type rating licence endorsement and identifies the Training, Checking and Currency minimum requirements. The OEB did not evaluate Cabin Crew Training, Maintenance Training, or the use of equipment or functions such as Enhanced / Synthetic Vision Systems (E/SVS), Steep Approaches, ETOPS, or wake vortex categorization, etc.

The evaluation of the Boeing Electronic Flight Bag has been performed in a separate operational evaluation and is subject of a dedicated consolidated OEB report on Boeing EFBs.

An operational evaluation of RNP (AR) operations has been deferred.

All relevant reports are available on the EASA OEB website at http://easa.europa.eu/certification/flight-standards/fs-overview.php.

This evaluation was conducted in accordance with the EASA OEB Handbook, the CPD, and applicable JAR-FCL 1 / Part-FCL and EU-OPS requirements.

2. Operational Evaluation B787-8

An operational evaluation of the B787 was conducted jointly by an integrated team composed of EASA, FAA and TCCA members, to simultaneously meet the applicable requirements. Each Authority used the results of the evaluation process to produce a report specific to its particular requirements that, while similar in intent, may differ somewhat in detail. This OEB report is applicable to operations under the framework of EASA.

Boeing requested that the following be evaluated:

- B787-8 pilot license endorsement;
- pilot differences training courses:
  - from the B777 to the B787-8; and
  - from the B787-8 to the B777;
- initial pilot type rating course on the B787-8;
- reduced pilot training courses based on commonality between the following aircraft types:
  - B737 300-900 with EFIS/PFD-ND and FMS to the B787-8;
  - B747-400 / -8 to the B787-8; and
  - B757/767 to the B787-8;
- CTLC credits from the B737 300-900, the B757/767 and the B747-400 to the B787-8;
- operational suitability of the B787-8; and
- compliance of the B787-8 with requirements contained in EU-OPS Subparts K & L.

The evaluation process commenced with a series of meetings during which Boeing presented the operating philosophy and general system arrangements of the B787-8.

Operator Differences Requirements (ODR) tables between the B737 300-900, the B747-400/-8, the B757/767 and the B777 to the B787-8 were proposed by Boeing as a basis for the evaluation. These ODR tables and associated system differences were assessed and found acceptable.

Following a flight evaluation of handling qualities (T2 Test) and comparison of systems differences, the OEB determined that differences training between the B777 and the B787-8 was acceptable.

The courses evaluated were:

- pilot differences training courses:
  - from the B777 to the B787-8; and
  - from the B787-8 to the B777;
- initial pilot type rating course on the B787-8;
- reduced pilot training courses based on commonality between the following aircraft types:
  - B737 300-900 with EFIS/PFD-ND and FMS to the B787-8;
  - B747-400 / -8 to the B787-8; and
  - B757/767 to the B787-8.

3. Conclusions

Emanating from these evaluations, this report specifies the EASA recommendations for training checking and currency requirements for the B787-8, in accordance with JAR-FCL 1 / Part-FCL and EU-OPS.

The OEB reviewed the Boeing B787-8 Standard Transition Course for initial Pilot Type Rating and found it to be compliant with JAR-FCL 1. The OEB recommends this course as a baseline for the B787-8 pilot type rating training and checking.

Although the B737 300-900 with EFIS/PFD-ND and FMS, the B747-400/-8, and the B757/767 are separate types from the B787-8, common handling qualities and other characteristics permit certain credits for training, checking, and currency. The OEB endorsed reduced pilot type training courses for the B787-8 based on commonality, for pilots who are current and qualified on the B737 300-900 with EFIS/PFD-ND and FMS, the B747-400/-8, or on the B757/767.

The OEB further reviewed the differences between the B777 and B787-8 and recommends the Boeing pilot differences training courses from the B777 to the B787-8 and vice versa.

As a consequence of this operational evaluation, the EASA OEB recommends:

- a single licence endorsement “B777/787” for the B777 and the B787-8 aircraft;

- approval of the Boeing B777 to B787-8 and B787-8 to B777 pilot differences training courses;
- approval of the Boeing initial pilot type rating course for the B787-8;
- approval of the Boeing reduced pilot training courses from the
  - B737 300-900 with EFIS/PFD-ND and FMS to the B787-8;
  - B747-400 / -8 to the B787-8; and
  - B757/767 to the B787-8.
- acceptance of the enclosed recommendations for operations on more than one type or variant with reference to JAR-FCL 1 / Part-FCL and EU-OPS; and
- acceptance of compliance of the B787-8 with requirements contained in EU-OPS Subparts K & L.
- recommendations for CTLC provisions.

Pilots who are qualified on the B787-8 and the B777 may complete proficiency checks in either variant, provided the applicable differences are covered.

This report also contains finding of operational suitability and compliance with Subparts K & L of EU-OPS.

Note on references and reference texts:
Where references are made to requirements and where extracts of reference texts are provided, these are at the amendment state at the date of publication of the report. Readers should take note that it is impractical to update these references to take account of subsequent amendments to the source documents.

Operational Evaluation Report – FCL/OPS Subgroup

1. Purpose and Applicability

This report addresses:

- pilot licence endorsement for the B787-8;
- Boeing design and operational concepts and B787-8 specifics;
- Master Differences Requirements (MDR) for flight crews requiring differences training;
- Operator Differences Requirements (ODR) tables;
- recommendations for type rating training courses
  - B787-8 Initial Type Rating Course (Transition Course)
  - B787-8 Reduced Type Rating Course (Shortened Transition Course)
- recommendations for differences training courses:
  - B777 to B787-8; and
  - B787-8 to B777;
- recommendations for operations on more than one type or variant;
- recommendations for checking, currency/recent experience;
- additional operational recommendations;
- recommendations for instructor training; and
- recommendations for CTLC provisions from the B737 300-900, B757/767 and B747-400 to the B787-8.

The B787-8 EFB is a Class 3 EFB similar in hardware to the B777 EFB. The evaluation of the Boeing Electronic Flight Bag has been performed as a separate operational evaluation and is contained in a special consolidated OEB report on Boeing EFBs.

This evaluation does not include Cabin Crew Training, Maintenance Training, Steep Approaches, or wake vortex categorization, etc.

An operational evaluation of RNP (AR) operations has been deferred. Operational credit for HUD use during all-weather operations has not been evaluated at this time.

2. Pilot License Endorsement

EASA recommends that a single license endorsement "**B777/787**" is applied for all B777-200 and -300 series, B777F and B787-8 series aircraft as shown in the following table.

1 Manufacturer	2 Aeroplanes		3	4 Licence Endorsement
	Model	Name		
Boeing		B777 - 200 series - 300 series B777F	(D)	B777/787
		B787 - 8 series		

3. Boeing Family Concept and B787 specifics

The B787 series design ensures similar characteristics between all Boeing EFIS/PFD-ND and FMS equipped aircraft regarding cockpit layout, system operation, and handling characteristics. This level of commonality has an impact on the design and construction of the training programmes.

3.1 Cockpit Layout

The cockpit arrangement has been designed to provide maximum commonality with all B777 variants and commonality between all Boeing EFIS/PFD-ND and FMS equipped aircraft through similar panel arrangements and similar controls (control column, flap/slats nomenclature, moving thrust levers, etc.), as well as the same "dark cockpit and push button" concept.

3.2 System Definition and Operation

The following are incorporated into the design:

- EFIS Primary Flight Displays (PFD) and Navigation Displays (ND) provide similar information, with similar symbology, colour coding and display principles;
- EICAS and System displays provide similar information;
- Autopilot, Flight Director, and Auto Throttle incorporate similar architecture, and generally provide the same functions for auto-flight control; and
- The Standard Normal and Non-Normal Procedures concept minimizes the impact of system dissimilarities, when dealing with normal and non-normal operations. Crew response to CAUTIONS and WARNINGS incorporates the same philosophy.

3.3 Handling Characteristics

Although the size, gross mass and aerodynamic characteristics of Boeing aircraft may differ, the systems were designed to minimize the differences in terms of handling characteristics. This similarity in the flight control feel permits a significant level of commonality in handling qualities.

3.4 Commonality in Aircraft Operational Philosophy

The Boeing EFIS/PFD-ND and FMS equipped aircraft have been designed to permit commonality of procedures as far as possible:

- similar normal procedures;
- similar supplementary normal and non-normal procedures dictated by EICAS and the ECL;
- similar control location for non-normal procedures;
- same CRM and task sharing between PF and PM.

3.5 Automatic Voice Callouts

The standard automatic voice callouts are compliant with EU-OPS. Consistent with the applicable regulations, these callouts may be customized in accordance with operator requirements (e.g. for low visibility operations). Callouts should be standardized within the applicable aircraft fleet when operating more than one type or variant.

3.6 Automatic Landing

Because of the similarity among the autoland systems of all Boeing EFIS/PFD-ND and FMS equipped aircraft, autoland training (including CAT II, III A and III B procedures) and qualification may occur in any B777/787 variant with differences training as specified by ODR tables. If a rollout system is installed on any variant flown, then autoland training must also address use of rollout capability.

3.7 Flight Management System

The FMS functions are similar in all B777/787 variants. Differences Training requirements are specified in the ODR tables.

3.8 Systems and Procedures Specific to the B787

The following systems and procedures are specific to the B787:

- Head-up Display (HUD);
- New Flight Management interface using EFB;
- FMS functionality upgrades;
- Limited Bleed Air systems installed;
- Wing optimization through flight control adjustments;
- Electric Cabin Pressurization; and
- Thrust Asymmetry Protection.

3.9 Head-up Display (HUD)

The B787-8 dual HUD is integrated with display alerting and autoflight systems. The symbology is compatible with the PFD. HUD use has been assessed in all phases of flight.

HUD training is an integral part of B787-8 flight training. HUD training is introduced in CBT and training devices, and is required to be trained in the FFS.

The OEB did not conduct an evaluation for credit of HUD use in All Weather Operations (AWO).

To maintain proficiency, recurrent training and operations should take into account operation with and without the use of HUD on a regular basis.

Further details for HUD training, checking and currency are contained in the relevant sections of this report.

3.10 Customization of Procedures and Checklists

The OEB evaluated standard Boeing procedures and checklists. Any customization should be evaluated by the Competent Authority.

3.11 Aircraft Approach Category

With reference to EU-OPS Appendix 2 to 1.430(c) the approach category for the B787-8 is as follows:

Aircraft	Category
B787-8	C or D

Depending on Maximum Landing Weight at which the aircraft is operated, the B787-8 approach Category can be C or D. The determination should be made by the operator based on approach speed calculations in accordance with applicable regulations.

3.12 EU-OPS Subpart K and L compliance

The OEB reviewed the EU-OPS Subpart K and L aircraft type compliance list provided by Boeing and confirmed compliance with EU-OPS of the specified items. Operator specific items have not been evaluated.

3.13 Operational Suitability Flights

The OEB conducted a representative number of Operational Suitability Flights and has determined operational suitability of the B787-8.

The areas of evaluation included normal operations and typical MEL scenarios for commercial air transport use, including:

- aircraft servicing (e.g. re- and de-fuelling);
- external electrical power and APU engine starts;

- aircraft towing and taxiing;
- communications equipment (SATCOM, ACARS, etc.);
- en-route diversions;
- missed approaches;
- manual and automatic flight operation;
- overweight landing.

4. Master Differences Requirements (MDR)

4.1 MDR Tables

MDR tables for the B777/787 variants are shown below. Definitions of the various levels for Training/Checking/Currency are those used in the CPD.

Master Differences Requirements (MDR) Table					
License endorsement: **B777/787**		**FROM AIRPLANE**			
TO AIRPLANE		**B777-200, -200ER, -200LR B777F**	**B777-300**	**B777-300ER**	**B787-8**
	B777-200, -200ER, -200LR B777F	**- -**	**A/A/A (B/A/A[2)])**	**A/A/A (B/A/A[2)])**	**D/D/C**
	B777-300	**B/A/A[1)]**	**- -**	**A/A/A (B/A/A[2)])**	**D/D/C**
	B777-300ER	**B/A/A[1)]**	**A/A/A (B/A/A[2)])**	**- -**	**D/D/C**
	B787-8	**D/D/C[3)]**	**D/D/C[3)]**	**D/D/C[3)]**	**- -**

1) The installation of SATCOM or FANS/DATALINK may require additional training.

2) When SATCOM or FANS/DATALINK/RNP is installed.

3) Training/checking for HUD operation requires use of FFS Level C or D. Training/checking for Flight Instrument Displays, IAN procedures and HUD displays requires use of FPT (minimum FSTD A Level 2) as described in the applicable training course specifications of this report.

Training at Level A assumes that crew members receive exposure to operation of doors/emergency exits on static aircraft or through other suitable means.

Note: The provisions between the B777 variants are described in the B777 OEB report.

4.2 Levels of Training, Checking and Currency (excerpts from the CPD)

***Level A Training**. Level A difference training is applicable to aircraft with differences that can adequately be addressed through self-instruction. Level A training represents a knowledge requirement such that, once appropriate information is provided, understanding and compliance can be assumed to take place. Compliance with level A training is typically achieved by methods such as issuance of operating manual page revisions, dissemination of flight crew operating bulletins or differences hand-outs to describe minor differences between aircraft. Level A training is normally limited to situations such as the following:*

a. *The change introduces a different version of a system/component for which the flight crew has already shown the ability to understand and use;*
b. *The change results in minor or no procedural changes and does not result in adverse safety effects if the information is not reviewed or is forgotten; or*
c. *Information highlighting a difference that, once called to the attention of a crew, is self-evident, inherently obvious, and easily understood.*

***Level B Training**. Level B difference training is applicable to aircraft with system or procedure differences that can adequately be addressed through aided instruction. At Level B aided instruction is appropriate to ensure crew understanding, emphasize issues, provide a standardized method of presentation of material, or to aid retention of material following training. Level B aided instruction typically employs means such as presentations, tutorials, Computer Based Training (CBT), stand-up lectures, videotapes, or DVDs.*

***Level D Training**. Level D differences training can only be accomplished with devices capable of performing flight manoeuvres and addressing full task differences affecting knowledge, skills, and/or abilities. Devices capable of flight manoeuvres address full task performance in a dynamic "real time" environment and enable integration of knowledge, skills and abilities in a simulated flight environment, involving combinations of operationally oriented tasks and realistic task loading for each relevant phase of flight. At Level D, knowledge and skills to complete necessary normal/ abnormal/emergency procedures are fully addressed for each variant. Training for Level D differences requires a training device that has accurate, high fidelity integration of systems and controls and realistic instrument indications. FFS or aircraft training may be specified for the conduct of specific manoeuvres or handling differences, such as HUD training or a single manoeuvre.*

***Level A Checking**. Level A checking indicates that no check related to differences is required at the time of differences training. A pilot is, however, responsible for knowledge of each variant flown. Differences items should be included as an integral part of subsequent proficiency checks.*

***Level D Checking**. Level D checking indicates that a partial proficiency check (PC) is required for one or more variants following both transition and recurrent training. In conducting the proficiency check, manoeuvres common to each variant may be credited and need not be repeated. The proficiency check covers the particular manoeuvres, systems, or devices designated by the OEB. Level D checks are performed using scenarios representing a "real time" flight environment and use devices permitted for Level D or higher differences training. A full PC is typically conducted on the base aircraft, and a partial PC on the variant, covering all pertinent manoeuvres except those common to both aircraft.*

***Level A Currency**. At Level A currency is considered to be common to each variant. Thus, assessment or tracking of currency for separate variants is not necessary or applicable. Maintenance of currency in any one variant or a combination of variants suffices for any other variant.*

***Level C Currency**. Level C currency is applicable to one or more designated systems or procedures, and relates to both skill and knowledge requirements. An example would be establishment of INS currency, FMS currency, flight guidance control system currency, or other particular currency that is necessary for safe operation of a variant. Establishment of Level C for a*

variant with a flight management system (FMS) would typically require a crewmember to fly that variant within the specified period or re-establish currency. Currency constraints for level C typically are 90 days. However, some systems or procedures may require shorter time limits while others may be longer than the normal interval for proficiency checks, if the pertinent items are not always addressed by these checks. When level C currency applies, any pertinent lower level currency must also be addressed. Examples of methods acceptable for addressing level C currency are:

a. *Crew scheduling practices resulting in a crewmember being scheduled to fly a variant with the pertinent system/procedure within the specified period;*
b. *Tracking of an individual crewmember's flying of variants to ensure that the particular system/procedure has been flown within the specified period;*
c. *Use of a higher level method (level D or E currency); or*
d. *Other methods as designated or found acceptable by the OEB.*

5. Operator Differences Requirements (ODR)

ODR tables are used to show an operator's compliance method. Boeing generic ODR tables concerning differences between the B777 and the B787-8 and vice versa, the B757/767 and the B787-8, the B747-400/-8 and the B787-8, and the B737 300-900, and the B787-8 respectively are on file with EASA. These ODR tables are provided as Boeing generic and therefore may not include items that are applicable to particular operators. The ODR tables assume that pilots are current and qualified on the base aircraft.

The Boeing ODR tables have been developed in accordance with EU-OPS 1.980 and TGL 44 AMC & IEM to Appendix 1 to OPS 1.980.

These ODR tables have been found acceptable by EASA. They represent an acceptable means of compliance with MDR provisions for the aircraft evaluated, based on those differences and compliance methods shown. These tables do not necessarily represent the only means of compliance for operators with aircraft having other differences.

Operators using more than one variant must have approved ODR tables pertinent to their fleet.

6. Specifications for Pilot Training

6.1 B787-8 Initial Type Rating Course (Transition Course)

The OEB reviewed the Boeing B787-8 Standard Transition Course for initial pilot type rating and found it to be compliant with JAR-FCL 1. The OEB recommends this course as a baseline for the B787-8 type rating training and checking.

Appendix 1 shows the footprint of the evaluated course, including the course duration and training devices used.

6.2 B787-8 Reduced Type Rating Course (Shortened Transition Course)

6.2.1 Prerequisites

For the scope of the EASA OEB evaluation, the Boeing B787-8 Reduced Type Rating Course requires the trainee to be "current and qualified" on either the B737 300-900 with EFIS/PFD-ND

and FMS, the B747-400/-8, or on the B757/767. In accordance with Part-FCL and EU-OPS this requires the trainee to have a valid License Skill Test (LST) or License Proficiency Check (LPC) and have met the Part-FCL / EU-OPS 1.970(a)(1) recent experience requirements on the relevant aircraft.

6.2.2 Training

The OEB reviewed the relevant differences and evaluated the Boeing B787-8 Reduced Type Rating Course for initial pilot type rating based on commonalities for the following combinations:

- B737 300-900 with EFIS/PFD-ND and FMS to B787-8;
- B747-400 / -8 to B787/8; and
- B757/767 to B787-8.

The training is based upon clearly defined objectives and addresses all items as identified in the ODR tables and validated by the OEB team in a joint evaluation. The OEB recommends this course as a baseline for the pilot type rating training from the B737 300-900 with EFIS/PFD-ND and FMS to the B787-8, the B747-400/-8 to the B787-8, or from the B757/767 to the B787-8.

Appendix 2 shows the footprint of the evaluated course, including the minimum course duration and training devices used.

6.3 B777 to B787-8 Differences Training Course

6.3.1 Prerequisites

The Boeing B777 to B787-8 Differences Training Course requires the trainee to be “current and qualified” on the Boeing B777. In accordance with Part-FCL and EU-OPS this requires the trainee to have a valid License Skill Test (LST) or License Proficiency Check (LPC) and have met the Part-FCL / EU-OPS 1.970(a)(1) recent experience requirements on the B777.

6.3.2 Training

The OEB has determined that the maximum level of differences between the B777 and the B787-8 are Level D as shown in the MDR table. Training and checking for HUD operation requires use of a FFS Level C or D. Training and checking for flight instrument displays, IAN procedures and HUD displays requires use of an FPT (minimum FSTD A Level 2).

The Boeing B777 to B787-8 Differences Training Course has been assessed and found acceptable to meet the training requirements. The training is based upon clearly defined objectives and addresses all items as identified in the ODR tables and validated by the OEB team in a joint evaluation.

Appendix 3 shows the footprint of the evaluated course, including the minimum course duration and training devices used.

6.3.3 Checking

Training organisations and operators should ensure that the knowledge and skills received in differences training are validated appropriately.

6.4 B787-8 to B777 Differences Training Course

6.4.1 Prerequisites

The Boeing B787-8 to B777 Differences Training Course requires the trainee to be “current and qualified” on the Boeing B787-8. In accordance with Part-FCL and EU-OPS this requires the trainee to have a valid License Skill Test (LST) or License Proficiency Check (LPC) and have met the Part-FCL / EU-OPS 1.970(a)(1) recent experience requirements on the B787.

6.4.2 Training

The OEB has determined that the maximum level of differences between the B787-8 and the B7777 are Level D as shown in the MDR table.

The Boeing B787-8 to B777 Differences Training Course has been assessed and found acceptable to meet the training requirements. The training is based upon clearly defined objectives and addresses all items as identified in the ODR tables and validated by the OEB team in a joint evaluation.

Appendix 4 shows the footprint of the evaluated course, including the minimum course duration and training devices used. The B777 FTD used for training is described in Appendix 6

6.4.3 Checking

Training organisations and operators should ensure that the knowledge and skills received in differences training are validated appropriately.

6.5 Training Areas of Special Emphasis (TASE)

6.5.1 The following items should receive special emphasis at the appropriate point during the ground and flight training (e.g. during CBT, FPT and/or FFS training) in all referenced training courses:

- Aircraft systems, including
    - EICAS engine display formats (for operation with different engine types)
- Flight Management System (FMS), including
    - All available FMS Approach / functions
    - European Approach Procedures (e.g. potential bypass of the holding and inversion during some types of “racetrack” procedures)
    - Proper visual outside scan during prolonged FMS management
    - Proper selection and use of modes and displays, such as look-ahead EGPWS, TCAS and Predictive Windshear System

- Navigation Display (ND) (e.g. clock function, RNAV/RNP symbology, etc.)
- Electronic Checklist (ECL), including
  - normal, supplementary normal and non-normal functions, proper use of ECL notes;
  - use of paper back-up;
  - crew coordination.
- Flight control system, including
  - modes of operation;
  - Fly-by-wire characteristics;
  - bank angle indications and protection;
  - stall and overspeed protection;
  - auto-throttle “wake up” function.
- Emergency equipment and procedures, including location, type/function, and operation of emergency equipment applicable to flight crews.

6.5.2 The following items should receive special emphasis at the appropriate point during the ground and flight training (e.g. during CBT, FPT and/or FFS training) in all training courses to the B787-8:

- Aircraft systems, including
  - electrical system;
- Flight Management System (FMS), including
  - FMS commanded speed bug during VNAV speed management according to flap configuration (next VFE speed);
  - FMS - EFB data transfer and performance calculations (e.g. aircraft mass entries in EFB and FMS).
- Airport moving map and vertical situation display
- Operation without HUD
- HUD use and symbology, including
  - HUD To/GA Mode Reset (use of Flight Director switches for HUD TO/GA setup);
  - the symbology for unusual attitude indications;
  - pilot eye reference position;
  - Integration of HUD use; visual outside scan, CRM concept;
  - PFD and HUD correlation;
  - the autopilot disconnect and HUD de-clutter buttons are similar in colour and characteristics and are located in close proximity on the control wheel. Pilots should be aware that it is possible to inadvertently disconnect the autopilot if the wrong button is selected when intending to de-clutter the HUD.

  Appendix 5 contains details regarding HUD training.

6.5.3 The following items should receive special emphasis at the appropriate point during the ground and flight training (e.g. during CBT, FTD and/or FFS training) in differences training from the B787-8 to the B777:

- Verification of take-off performance calculation
- Engine manual start and start malfunctions
- Thrust Asymmetry Compensation (TAC), normal and failure operation (including autopilot missed approach from AUTOLAND with TAC failure)

6.5.4 Operators may add additional elements as required by their operation, and these will vary. Training organisations should review their training courses when applicable aircraft modifications occur. Training organisations may add additional elements as required by the operator.

6.6 Low Visibility Operations

Training for low visibility operations is addressed in EU-OPS 1.450. In accordance with Appendix 1 to EU-OPS 1.450 § (d), an abbreviated course may be acceptable subject to approval by the Competent Authority, for a pilot already experienced in low visibility operations.

For a pilot qualified and experienced in low visibility operations on the B777 aircraft, one low visibility approach and landing should be included in the differences training from the B777 to the B787-8 and vice versa.

6.7 Special Events Training

Special events training to improve basic crew understanding and confidence regarding aircraft handling qualities, options and procedures as these relate to design characteristics and limitations may include the following:

- recovery from unusual attitudes;
- manual flight with minimum use of automation, including flight under degraded levels of automation;
- handling qualities and procedures during recovery from an upset condition (e.g., wake vortex encounter, loss of control incident);
- high altitude high and low speed buffet margins and flight characteristics;
- Controlled Flight Into Terrain (CFIT) avoidance, TCAS, EGPWS (emphasis on avoidance and escape manoeuvres, altitude awareness, TCAS / EGPWS warnings, situational awareness and crew co-ordination, as appropriate).

Special events training is not considered as required additional training.

6.8 Recurrent Training

The recurrent training programme must comply with EU-OPS 1.965.

All B777-200 and -300 series, B777F and B787-8 series are covered under the same licence endorsement and therefore, recurrent training on one variant is valid for any other, as long as the differences between variants are addressed. Provided that these differences are addressed as described below, recurrent training can be conducted on any approved B777-200 or -300 series, B777F and B787-8 series Full Flight Simulator.

Differences between the B777-200 and -300 series, B777F and B787-8 series are identified in ODR tables, as specified in EU-OPS 1.980. The B777 to B787-8 differences have been assessed at Level C for recurrent training, i.e. these differences must be addressed in a B787 FPT or B787 FFS.

Recurrent training should incorporate special events training as described in para. 6.7 on a rotational basis.

7. Specifications for Checking

7.1 Recurrent Checks

Proficiency checks must be conducted in compliance with EU-OPS 1.965 and FCL.740.A for the revalidation of class and type ratings. A proficiency check conducted on any B777-200 and -300 series, B777F and B787-8 series is valid for any other variant, provided that the differences have been covered during the recurrent training, as per the approved ODR tables.

Consequently proficiency checks can be conducted on any approved B777-200 and -300 series, B777F or B787-8 series FFS. However, operators should use simulators suited to their particular fleet and types of operation.

When operating more than one B777/787 variant, recurrent checks should be alternated between the variants flown to the extent possible.

7.2 Line Checks

As all B777-200 and -300 series, B777F and B787-8 series share the same single licence endorsement, a line check on any variant is valid for all variants.

This does not relieve operators from line check requirements specific to route and airport qualification as prescribed in EU-OPS.

8. Specifications for Recent Experience and Currency

8.1 Recent Experience

Compliance with EU-OPS 1.970 or FCL.060 is required for recent experience. Take-offs and landings performed on any B777-200 and -300 series, B777F and B787-8 series are valid for all variants.

8.2 HUD Currency

When operating the B787-8 as PF using a HUD, the pilot must have either:

- operated the B787-8 using the HUD as PF or PM; or
- completed a B787-8 HUD refresher training; or
- performed a proficiency check which included HUD operation

within the previous 180 days.

No special currency requirements are proposed when operating as PM.

9. Line Flying Under Supervision (LIFUS) / Familiarization Flights

9.1. Purpose of LIFUS / Familiarization Flights

LIFUS must be performed in accordance with relevant EU-OPS requirements. There are a variety of reasons why the OEB may specify LIFUS / Familiarization Flights in conjunction with Master Differences Requirements. One or more of the reasons described below may apply:

a. Introduction of new aircraft types or variants;
b. Introduction of new systems (e.g., FMS, ECL, TCAS, HUD);
c. Introduction of new operation (e.g. oceanic, polar or ETOPS operations);
d. Experience for a particular crew position (e.g. PIC, SIC);
e. Post qualification skill refinement (e.g. refining alternate or multiple ways to use particular equipment to increase operating efficiency, operating flexibility, or convenience); or
f. Special characteristics (e.g. airport category in accordance with EU-OPS 1.975, mountainous areas, unusual or adverse weather, special air traffic control procedures, non-standard runway surfaces and dimensions, etc.).

9.2 LIFUS following B787-8 Full Type Rating Courses

In the case of Pilots completing Initial Type Rating for the B787-8, it is recommended that a minimum of 8 sectors LIFUS should be performed, followed by a 2 sector line check. Operation with and without the use of HUD in different phases of flight should be addressed.

In accordance with JAR-FCL 1, a supervised exterior inspection on the B787-8 must be part of LIFUS following the Boeing B787-8 full type rating course. An unsupervised exterior inspection is not permitted until this requirement has been fulfilled.

9.3 LIFUS following B787-8 Reduced Training Courses Based on Commonality Between Aircraft Types

In the case of pilots completing a reduced training course for the B787-8, it is recommended that a minimum of 4 sectors LIFUS should be performed, followed by a 2 sector line check. Operation with and without the use of HUD in different phases of flight should be addressed.

In accordance with JAR-FCL 1, a supervised exterior inspection on the B787-8 must be part of LIFUS following the Boeing B787-8 reduced type rating course. An unsupervised exterior inspection is not permitted until this requirement has been fulfilled.

9.4 Familiarization Flights Following B777 to B787-8 Pilot Differences Training

It is recommended that a minimum of 2 sectors of familiarization flights following B777 to B787-8 differences training are conducted. This is intended to permit pilots to obtain additional operating experience in order to become fully cognizant of the differences between these variants. Familiarization flights can be conducted with a flight crew member designated by the operator and approved by the Competent Authority. Operation with and without the use of HUD in different phases of flight should be addressed.

It is recommended that a supervised exterior inspection is completed following the Boeing B777 to B787-8 pilot differences training course.

9.5 Familiarization Flights Following B787-8 to B7777 Pilot Differences Training

It is recommended that a minimum of 2 sectors of familiarization flights following B787-8 to B777 differences training are conducted. This is intended to permit pilots to obtain additional operating experience in order to become fully cognizant of the differences between these variants. Familiarization flights can be conducted with a flight crew member designated by the operator and approved by the Competent Authority.

It is recommended that a supervised exterior inspection is completed following the Boeing B787-8 to B777 pilot differences training course.

10. Synthetic Flight Instructor (SFI) (A) Type Rating Instructor (TRI) (MPA) Training

JAR-FCL 1.410 / 1.365, applies. However, for a holder of a license with a valid endorsement SFI(A) or TRI(MPA) B777 (or B787-8 respectively), the following is recommended:

Completion of the B777 to B787-8 differences training (or vice versa), followed by instructor differences training which must be described in the OPS Manual Part D and/or TRTO/ATO Manual, and approved by the Competent Authority.

11. Specification for Operations of More Than One Type – MFF (Mixed Fleet Flying)

11.1 Prerequisites

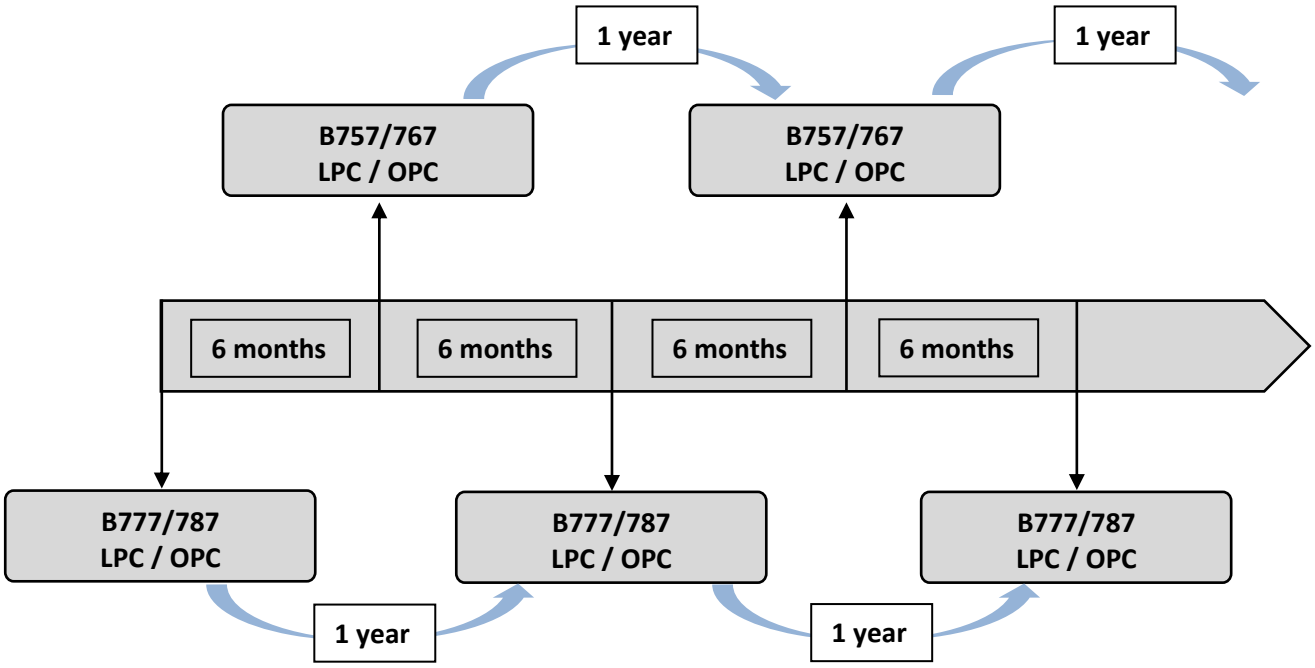
Prerequisites for flying more than one type (Mixed Fleet Flying – MFF) are contained in EU-OPS 1.980. Typically it consists of a consolidation period following the initial line check on the new type.

MFF operations between the B777/787 and the B737 300-900, and between the B777/787 and the B757/767 have been evaluated. Additional aircraft types may be considered at the discretion of the Competent Authority. MFF with the B757/767 is given below as an example.

11.2 Recurrent Training and Proficiency Checks

The recurrent training programme must comply with EU-OPS 1.965. All B777/787 variants are under the same type rating licence endorsement. As a consequence, recurrent training on one variant is valid for all, provided that the differences between variants are covered.

In accordance with Appendix 1 to EU-OPS 1.980 §(d)(7)(i), an alternate recurrent training and checking programme can be established. Therefore, the Competent Authority may approve an alternate recurrent training and checking programme for the Operator, and the OEB recommend the following implementation plan:



The above scheme allows compliance with the mandatory 1 year for type rating revalidation under JAR-FCL 1.245 (b), as well as with the operator proficiency check requirement taking benefit of the alternate provision as set up in Appendix 1 to EU-OPS 1.980 (see § (d)(7)(i)).

Note: Concerning the recurrent training for low visibility operations, the OEB team considers that full credit applies between variants/types, provided that low visibility training is conducted during recurrent training every 6 months.

11.3 Line Checks

Line checks are required in compliance with EU-OPS 1.965 (c). However, for operation on more than one type or variant credit may be given in accordance with Appendix 1 to EU-OPS 1.980 § (d)(7)(ii).

11.4 Currency / Recent Experience

Compliance with Part-FCL / EU-OPS 1.970 as appropriate is required for recent experience. Under Mixed Fleet Flying, EU-OPS 1.980 applies.

With reference to Part-FCL, FCL.060 (b) (4), and Appendix 1 to EU-OPS 1.980 § (d) (5) & (7), Competent Authorities may consider common take-off and landing credit (CTLC).

11.5 Common Take-Off and Landing Currency (CTLC) Provisions

Part-FCL, FCL.060 and EU-OPS 1.970 contain the recent experience requirements for take-off and landing. This chapter allows for credit of recent experience that can be granted between different aircraft types, to satisfy these requirements.

The scope of the evaluation was to demonstrate that the base aircraft and the candidate aircraft have similar handling characteristics, so that an equivalent level of safety can be maintained allowing credits from one aircraft to another for the purpose of maintaining the recent experience requirements of Part-FCL / EU-OPS.

11.5.1 CTLC Evaluation

An evaluation of take-off and landing handling characteristics, for the purpose of allowing CTLC credit, was conducted jointly by an integrated team composed of EASA and FAA members, to simultaneously meet the applicable requirements. This CTLC T6 test was performed in accordance with FAA AC120-53A and EASA Draft CS FCD during the period 25 - 27 April 2012 at Boeing Seattle, with the use of FFS and engineering simulators for the base aircraft and an airplane and a FFS for the candidate aircraft (B787-8).

Common Take-off and Landing Credit to the B787-8 from the following aircraft have been evaluated: from the B737 300-900, from the B757/767, and from the B747-400. For the purpose of the evaluation 12 Pilots, from airlines and Authorities, participated as test subjects. 4 Pilots were rated on the B737 300-900, 4 on the B767/757 and 4 on the B747-400. None of them had any experience or rating on the candidate aircraft (B787-8).

The evaluation generally demonstrated similar handling characteristics between base aircraft and the candidate aircraft, through the evaluation of consistency between approaches, landings and take-offs, and comments received from the test subjects. Some differences emerged between the handling qualities of the B747-400 and the B787-8, and between the B737 300-900 and the B787-8.

11.5.2 CTLC Credits

Emanating from this evaluation, EASA recommends that take-off and landing credits for pilots flying more than one type of aeroplane are granted as specified in Appendix 7.

For the time being, CTLC credits are applicable from the B737 300-900, the B757/767 and the B747-400 to the B787-8.

Operators wishing to take advantage of CTLC credits should have an SMS in place which should include a process for monitoring take-offs and landings for pilots flying more than one type of aeroplane (e.g. through Flight Data Monitoring).

After a sufficient in service experience will be available, CTLC credits may be reviewed as necessary.

In summary, EASA recommends that take-offs and landings performed on the B737 300-900, the B757/767, or the B747-400 aircraft may be credited towards the take-off and landing requirements for the B787-8 as specified in Appendix 7.

In addition, full credit for take-off and landing exists between the B787-8 and the B777, based on their evaluation as variants (T2 test).

Appendix 1

B787-8 Full Type Rating

Day 1	Day 2	Day 3	Day 4	Day 5
Tablet Introduction **CBT 1** (3:00)	**CBT 2** (7:00)	**CBT 3** (7:00)	**CBT 4** (3:00) **FPT 1** (4:00)	**Tutorial 1 OPT** (6:30)
Day 6	**Day 7**	**Day 8**	**Day 9**	**Day 10**
CBT 5 (3:00) **FPT 2** (4:00)	**CBT 6** (3:00) **FPT 3** (4:00)	**CBT 7** (3:00) **FPT 4** (4:00)	**CBT 8** (3:00) **FPT 5** (4:00)	**CBT 9** (3:00) **FPT 6** (4:00)
Day 11	**Day 12**	**Day 13**	**Day 14**	**Day 15**
CBT 10 (3:00) **FPT 7** (4:00)	**CBT 11** (3:00) **FPT 8** (4:00)	**CBT 12** (3:00) **FPT 9** (4:00)	**CBT 13** (1:00) **FPT 10** (6:00)	**Tutorial 2 EFB, QRH** (4:00) **Tutorial 3 LBS** (3:00)
Day 16	**Day 17**	**Day 18**	**Day 19**	**Day 20**
TKE (4:00) **Variances (if needed)** (3:00)	**FFS 1** (6:00)	**FFS 2** (6:00)	**FFS 3** (6:00)	**FFS 4** (6:00)
Day 21	**Day 22**	**Day 23**	**Day 24**	
FFS 5 (6:00) **Windshear Briefing** (0:30)	**FFS 6** (4:00)	**FFS 7** (4:00)	**Skill Test**	

Notes:

Times for FPT include 1.5 Hour briefing and .5 Hour debriefing
Times for FFS include 1.5 Hour briefing and .5 Hour debriefing

FPT: Boeing B787-8 Flat Panel Trainer, compliant with JAR FSTD A Level 2
FFS: B787-8 FFS Level C or D

TKE: Technical Knowledge Examination
LBS: Load & Balance and Servicing
OPT: Operational Performance Tool
EFB: Electronic Flight Bag
QRH: Quick Reference Handbook

This table reflects the Full Type Rating course evaluated by EASA, which was found to be compliant with applicable requirements. Any variations to this course should be evaluated by the Competent Authority or through an OEB evaluation. This serves to ensure that an equivalent level of training and safety are reached, and may lead to variations to the table above.

Appendix 2

B787-8 Reduced Type Rating

(For pilots who are current and qualified either on the B737 300-900 with EFIS/PFD-ND and FMS, the B747-400/-8, or on the B757/767)

Day 1	Day 2	Day 3	Day 4	Day 5
Tablet Introduction **CBT 1** (4:00)	**Tutorial 1 OPT** (6:30)	**CBT 2** (3:00) **FPT 1** (4:00)	**CBT 3** (3:00) **FPT 2** (4:00)	**CBT 4** (3:00) **FPT 3** (4:00)
Day 6	**Day 7**	**Day 8**	**Day 9**	**Day 10**
CBT 5 (3:00) **FPT 4** (4:00)	**CBT 6** (3:00) **FPT 5** (4:00)	**CBT 7** (1:30) **FPT 6** (6:00)	**Tutorial 2 EFB, QRH** (4:00) **Tutorial 3 LBS** (3:00)	**TKE** (4:00) **Variances (if needed)** (3:00)
Day 11	**Day 12**	**Day 13**	**Day 14**	**Day 15**
FFS 1 (6:00)	**FFS 2** (6:00)	**FFS 3** (6:00) **Windshear Briefing** (0:30)	**FFS 4** (6:00)	**FFS 5** (6:00)
Day 16				
Skill Test				

Notes:

Times for FPT include 1.5 Hour briefing and .5 Hour debriefing
Times for FFS include 1.5 Hour briefing and .5 Hour debriefing

FPT: Boeing B787-8 Flat Panel Trainer, compliant with JAR FSTD A Level 2
FFS: B787-8 FFS Level C or D

TKE: Technical Knowledge Examination
LBS: Load & Balance and Servicing
OPT: Operational Performance Tool
EFB: Electronic Flight Bag
QRH: Quick Reference Handbook

This table reflects the Previous Experience Type Rating course evaluated by EASA, which was found to be compliant with applicable requirements. Any variations to this course should be evaluated by the Competent Authority or through an OEB evaluation. This serves to ensure that an equivalent level of training and safety are reached, and may lead to variations to the table above.

Appendix 3

B777 to B787-8 Differences Training

Day 1	Day 2	Day 3	Day 4	Day 5
Tablet Introduction (1:30) **CBT** (5:30)	**Tutorial 1 OPT** (1:30) **CBT** (5:30)	**Tutorial 2 EFB** (1:30) **FPT 1** (6:00)	**Tutorial 3 EFB** (1:30) **FPT 2** (6:00)	**Tutorial 4 LBS** (3:00) **Variances (if needed)** (3:00)
Day 6	**Day 7**			
FFS 1 (6:00)	**FFS 2** (6:00)			

Notes:

Times for FPT include 1.5 Hour briefing and .5 Hour debriefing
Times for FFS include 1.5 Hour briefing and .5 Hour debriefing

FPT: Boeing B787-8 Flat Panel Trainer, compliant with JAR FSTD A Level 2
FFS: B787-8 FFS Level C or D

LBS: Load & Balance and Servicing
OPT: Operational Performance Tool
EFB: Electronic Flight Bag

If a candidate does not have the necessary pre-requisite knowledge of EFB, additional EFB training needs to be completed prior to Day 3 (Tutorial 2 EFB).

This table reflects the Differences Training course evaluated by EASA, which was found to be compliant with applicable requirements. Any variations to this course should be evaluated by the Competent Authority or through an OEB evaluation. This serves to ensure that an equivalent level of training and safety are reached, and may lead to variations to the table above.

Appendix 4

B787-8 to B777 Differences Training

Day 1	Day 2	Day 3	Day 4	Day 5
Introduction (2:00) **CBT** (5:00)	**CBT** (6:00) **Self-Study** (1:00)	**Self-Study** (1:00) **FTD** (6:00)	**Self-Study** (1:00) **FFS 1** (6:00)	**Self-Study** (1:00) **FFS 2** (6:00)
Notes: **Times for FTD include 1.5 Hour briefing and .5 Hour debriefing** **Times for FFS include 1.0 Hour briefing and .5 Hour debriefing** **FTD: Boeing B777 Flat Panel Trainer, as described in Appendix 6** **FFS: B777 FFS Level C or D**				

This table reflects the Differences Training course evaluated by EASA, which was found to be compliant with applicable requirements. Any variations to this course should be evaluated by the Competent Authority or through an OEB evaluation. This serves to ensure that an equivalent level of training and safety are reached, and may lead to variations to the table above.

Appendix 5

B787-8 Example HUD Training and Currency

1. Training Requirements

The HUD pilot training is integrated in all B787 ground and flight training. The HUD is a dual installation so both pilots will be trained on the HUD.

HUD initial and recurrent training requires the use of a FFS Level C or D which can be combined with the use of an FPT (minimum FSTD A Level 2) for HUD symbology training.

1.1 Initial Ground Training:

Initial training should be conducted in accordance with the applicable provisions of Part-FCL and EU-OPS. The initial ground training programme should include the following elements:

- Classroom instruction or CBT covering HUD operational concepts, flight crew duties and responsibilities and operational procedures including preflight, normal and non-normal pilot activities;
- Classroom instruction or CBT on the HUD symbology and it's inter-relationship with airplane aerodynamics, inertial factors and environmental conditions;
- A HUD pilot training manual or equivalent material in the Operations Manual which explains all modes of operation, the use of various HUD controls, clear descriptions of HUD symbology including limit conditions and failures, and incorporating use of the HUD into existing crew procedures.

1.2 Initial Flight Training:

Initial flight training should be conducted in accordance with the applicable provisions of Part-FCL and EU-OPS. HUD familiarization and proficiency is integrated into the flight training programme. For flight simulator training, training to use the HUD for the landing manoeuver should be conducted with a sufficient final approach segment to identify and train the appropriate symbology and HUD usage.

The following flight training programme is generic in nature and should not be construed to dictate what is included in the course of instruction. This training can be integrated in the basic training course. Each operator has its own unique requirements, route structure, fleet composition and operations policies to consider in developing their training programme.

The following might be considered as guidance to an operator which is tailoring a HUD training programme to fit its own needs.

A. Airwork: Airwork integrated into the training programme. Emphasis should be placed on HUD unique symbology, i.e., flight path, flight path acceleration, airspeed error tape, and the commonality with the heads down display (the PFD). When this training is complete, the trainee should have a thorough understanding of the relationship between aircraft flight path parameters and the HUD symbology.

B. Visual Approaches: Sufficient approach work to show HUD symbology and use in relation to glide path, centreline control, and crosswind conditions

C. Instrument Approaches: Sufficient ILS/GLS and non-precision approaches, missed approaches, and landings with appropriate weather minimums to show HUD symbology and gain proficiency in these manoeuvres.

2. All Weather Operations

Additional training is required for operators to receive credit for low visibility operations.

Operators must meet the applicable requirements of EU-OPS Subpart E (All Weather Operations).

3. HUD Currency

When operating the B787-8 as PF using a HUD, the pilot must have either:

- operated the B787-8 using the HUD as PF or PM; or
- completed a B787-8 HUD refresher training; or
- performed a proficiency check which included HUD operation

within the previous 6 months.

No special currency requirements are proposed when operating as PM.

Appendix 6

Boeing B777 Flight Training Device (FTD)

Description of the device used in the B787-8 to B777 Differences Course evaluation and recommendations.

1. Description of the device used

The three dimensional type specific device consisted of graphically simulated, interactive touch panels, instruments, switches and controls in a spatially correct position.

Instruments and panels were computer generated, interactive touch activated graphics displayed on multiple screens, however aircraft panels requiring intensive manipulation such as Mode Control Panel (MCP), Display Select Panel, EFIS Control Panels and Electronic Flight Bag (EFB), if installed; consisted of replicated aircraft panels with physical controls, knobs and switches. The thrust lever quadrant was displayed on a computer generated graphics display.

Airplane systems were operative for flight and ground conditions. Simulated aircraft systems were fully integrated to ensure correct interaction, especially between the FMS, AFCS, ECL, flight instrument displays and EFB, if installed. The device was able to simulate the different approach modes with either go-around or automatic landing. Warning and caution sounds were simulated.

Computer generated schematics to visualize aircraft system operation were provided.

The device incorporated the necessary malfunctions to accomplish the training of Normal, Supplementary Normal and Non-Normal operating procedures.

The device incorporated the necessary navigational databases to complete the defined training scenarios over a local or world-wide area.

An Instructor Operating Station (IOS) was available to allow the modification of flight and environmental conditions (wind, temperature, pressure, etc.). It permitted repositions (flight and ground), freezes, system resets, airport selection, aircraft services (doors, ground power, virtual circuit breaker, etc.). Lesson plan tools were provided.

The computer(s) had sufficient capacity and capability to ensure an accurate and reliable operation, with realistic responsiveness and aliasing free graphics.

The device was located in a suitable, quiet room, free of training distractions, with adequate temperature and lighting conditions.

2. Recommendations

2.1 The device should include a replicated or actual FMS/CDU unit.

2.2 The device should allow airline specific options.

2.3 The competent Authority approving the Training Organisation should review the device for suitability to complete the customer specific training programme.

2.4 Because the training device used is not certified to a specific FSTD standard, the training organisation operating the device should have a Quality Assurance Programme in place to cover, at least, the following training device aspects:

- Recording, monitoring and rectification of failures and discrepancies;
- Failure analysis and reliability figures;
- Link with the aircraft manufacturer to ensure the device continuously reflects the real aircraft;
- Link with the training device manufacturer for the incorporation of updates and modifications;
- Configuration control processes to ensure adequate tracking and recording of software and hardware modifications; and
- Resources and personnel training to support its operation.

Appendix 7

Common Take-off and Landing Credit (CTLC)

Part-FCL, FCL.060 and EU-OPS 1.970 contain the recent experience requirements for take-off, approach and landing. EASA recommends that take-offs and landings performed on the B737 300-900, the B757/767, or the B747-400 aircraft may be credited towards the take-off and landing requirements for the B787-8 as specified in the following table.

Credit for recent experience in accordance with Part-FCL, FCL.060	
from aircraft	**to the B787-8**
B737 300-900	2 take-offs and 2 landings may be credited in the preceding 90 days
B747-400	1 take-off and 1 landing may be credited in the preceding 90 days
B757/767	Full credit (3 take-offs and 3 landings) in the preceding 90 days. At least 1 take-off and 1 landing must be performed in the B787-8 (aircraft or FFS Level C or D) within the preceding 6 months.
B777	The B777 and the B787-8 share the same single license endorsement. Take-offs and landings performed in either variant are fully credited when operating these variants.
Note 1: CTLC from the B787-8 to other aircraft has not been evaluated. Note 2: CTLC from to the B777 has not been evaluated	