



**Explanatory Notes**  
**Transition from Operational Evaluation Board (OEB) Reports**  
**to Operational Suitability Data (OSD)**  
**for Flight Crew Data**

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27 March 2015

**1. General**

Based on request from industry, operational evaluations have been conducted by the JAA and then by EASA since 1997. Associated OEB reports are published on the EASA website in support of Approved Training Organisations (ATO) and operators, for the aircraft, equipment and/or operations which have been evaluated in the relevant OEB reports.

With the entry into force of Commission Regulation (EU) No 69/2014 on 18 February 2014 the concept of Operational Suitability Data (OSD) was implemented, integrating operational evaluation elements into the certification design process as foreseen in the Basic Regulation<sup>1</sup>. Available operational suitability data are then referenced in the applicable Type Certificate Data Sheet (TCDS).

**2. Transition of existing OEB reports to OSD**

Commission Regulation (EU) No 69/2014 introduces Article 7a of Commission Regulation (EU) No 748/2012. Paragraph 3 of Article 7a states: "*Operational Evaluation Board reports and master minimum equipment lists issued in accordance with JAA procedures or by the Agency before the entry into force of this Regulation [18 February 2014] shall be deemed to constitute the operational suitability data approved in accordance with point 21.A.21(e) of Annex I (Part 21) and shall be included in the relevant type-certificate. Before 18 June 2014 the relevant type-certificate holders shall propose to the Agency a division of the operational suitability data in mandatory data and non-mandatory data.*"

The Agency is in the process of reviewing the division of the operational suitability data of OEB reports. Completed reviews may be attached to published OEB reports on the EASA website as an interim measure, or may lead to completely transposed OSD documents held by the TC/STC holders.

The transition of OEB reports will be completed with the inclusion of OSD references in the relevant TCDS, the OEB reports concerned will be withdrawn from the EASA website, and associated OSD documents will be held by the manufacturer (TC/STC holder).

**3. Provision of Operational Suitability Data (OSD) to users**

Commission Regulation (EU) No 69/2014 amends Annex I (Part 21) to Regulation (EU) No 748/2012, para. 21.A.62 which regulates the provision of operational suitability data, as follows:

*"The holder of the type-certificate or restricted type-certificate shall make available:*

- (a) at least one set of complete operational suitability data prepared in accordance with the applicable operational suitability certification basis, to all known EU operators of the aircraft, before the operational suitability data must be used by a training organisation or an EU operator; and*
- (b) any change to the operational suitability data to all known EU operators of the aircraft; and*
- (c) on request, the relevant data referred to in points (a) and (b) above, to:*

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<sup>1</sup> REGULATION (EC) No 216/2008 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 20 February 2008 on common rules in the field of civil aviation and establishing a European Aviation Safety Agency, and repealing Council Directive 91/670/EEC, Regulation (EC) No 1592/2002 and Directive 2004/36/EC, as amended.

1. *the competent authority responsible for verifying conformity with one or more elements of this set of operational suitability data; and*
2. *any person required to comply with one or more elements of this set of operational suitability data."*

#### **4. Integration of OSD provisions by users**

##### **4.1 OSD Flight Crew (OSD FC) Data**

In addition to reference of OSD FC data in the TCDS, the Agency maintains the EASA Type Rating & License Endorsement Lists Flight Crew on its website, one for Helicopters and one for all other aircraft. These lists constitute the class and type of aircraft categorisations in accordance with Part-FCL<sup>2</sup>. The lists also reference Operational Evaluation Board (OEB) Flight Crew reports and Operational Suitability Data (OSD) Flight Crew, where available.

Type rating training approved before the approval of the minimum syllabus of pilot type rating training in the Operational Suitability Data for the relevant type of aircraft shall include the mandatory training elements not later than 18 December 2017 or within two years after the operational suitability data was approved, whichever is the latest<sup>3</sup>.

The ATO shall ensure that students meet all the pre-requisites for training as defined in the mandatory part of the operational suitability data, if established [Regulation (EU) No 748/2012, ORA.ATO.145]<sup>3</sup>.

Operators shall ensure that flight crew members who are already in operation and have completed training which did not include the mandatory elements established in the relevant operational suitability data, undertake training covering those mandatory elements not later than 18 December 2017 or two years after the approval of the operational suitability data, whichever is the latest<sup>3</sup>.

Annex III (PART-ORO) and Annex V (PART-SPA) to Regulation (EU) No 965/2012 contain further amendments.

#### **4. Further transition arrangements**

Commission Regulation (EU) No 69/2014, No. 70/2014, and No. 71/2014 should be consulted for further transition arrangements.

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<sup>2</sup> Annex I of Commission Regulation (EU) No 1178/2011 of 3 November 2011 ("Part-FCL"), as amended

<sup>3</sup> Commission Regulation (EU) No 70/2014 of 27 January 2014 amending Regulation (EU) No 1178/2011

## Operational Suitability Data (OSD) for the Airbus A380 Family A380-800

In accordance with Article 7a, para 3 of Commission Regulation (EU) No 69/2014 of 27 January 2014, the OEB report, titled Airbus A380-800, revision 1, dated 18 July 2011 shall be deemed to constitute the operational suitability data approved in accordance with point 21.A.21(e) of Annex I (Part 21).

The following table establishes the division of the operational suitability data in mandatory data and non-mandatory data.

<b><u>MANDATORY DATA</u></b>	<b><u>NON MANDATORY DATA</u></b>
2. Pilot Type Rating requirements	
	3. Airbus family concept and A380 specifics
4. Master Difference Requirements tables	
5. Operator Differences Requirements Tables	
	6.1.1 Prerequisites
6.1.2 Training areas of special emphasis	6.1. 3 Type rating course: Standard Transition course
	6.1.4 A380 Type Rating courses – CCQ
6.2 A380 Familiarization course	
6.3 Low visibility training	6.4 Recurrent training
7.1 Skill test following type-rating courses (Standard course or CCQ course)	
	7.2 Recurrent Checks
7.3 Line checks	
8. Specification for Currency / Recent experience	
9. Specification for LIFUS	
10 Type Rating Instructor training	
11.1 Prerequisites [for MFF]	
11.2 Recurrent training and proficiency checks	
11.3 Line checks	
11.4 Currency / Recent experience	
	12 Additional Operational recommendations

<b><u>MANDATORY DATA</u></b>	<b><u>NON MANDATORY DATA</u></b>
	13 A380 Three Engine Ferry Flight (3EFF)
	Annex 1 – Typical A380 Standard Transition Course footprint
	Annex 2 – Typical CCQ A330/A340 to A380 footprint
	Annex 3 – Typical CCQ A320 to A380 footprint
Annex 4 – Zero Flight Time Training following A330/A340 CCQ	

The initial data were established in accordance with the JAA Terms of Reference and the JOEB Handbook. The A380 3EFF evaluation was conducted in compliance with the applicable EASA OEB Handbook and Common Procedure Document (CPD) for conducting Operational Evaluation Boards. The data are in compliance with CS-FCD, initial issue dated 31 January 2014.

Provisions contained in the A380 OEB report are related to the corresponding regulations for civil aviation aircrew and air operations.

These data will be included in the relevant type-certificate(s) in due course.



**EUROPEAN AVIATION SAFETY AGENCY**



# **Operational Evaluation Board Report**

## **Airbus A380-800 Report of the FCL/OPS Subgroup**

**Report, Revision 1**

**18 July 2011**

**European Aviation Safety Agency  
Postfach 10 12 53  
D-50452 Köln  
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## Airbus A380-800

### Operational Evaluation Board (OEB) – OPS / FCL Subgroup



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#### Revision Record

Rev. No.	Content	Date
Original	A380-800 new evaluation	27 Oct 2008
1	A380-800 Three Engine Ferry Flight incorporated	Draft: 05 May 2011 Final: 18 Jul 2011

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**Acronyms**

AC	Advisory Circular
ACJ	Advisory Circular Joint
ACRM	Airbus Crew Resource Management
ADT	Airplane Difference Table
AFM	Airplane Flight Manual
AFCS	Automatic Flight Control System
AMC	Acceptable Means of Compliance
AOC	Airline Operations Communications
AP	Autopilot
AR	Airworthiness Related items
CAR	Canadian Aviation Regulation
CBT	Computer Based Training
CCD	Cursor Control Device
CCOM	Cabin Crew Operation Manual
CCQ	Cross Crew Qualification
CDL	Configuration Deviation List
CFR	Code of Federal Regulations
CMC	Centralized Maintenance Computer
CPD	Common Procedure Document
CRM	Crew Resource Management
EASA	European Aviation Safety Agency
ECAM	Engine/Warning and System Display
ECL	Electronic Check List
EFB	Electronic Flight Bag
EFIS	Electronic Flight Instrument System (PFD)
EGPWS	Enhanced Ground Proximity Warning System
EU-OPS	Annex III to Regulation (EEC) No 3922/91
EVS	Enhanced Vision System
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FBW	Fly By Wire
FCL	Flight Crew Licensing
FCTM	Flight Crew Training Manual
FCTP	Flight Crew Training Program
FCOM	Flight Crew Operating Manual
FFS	Full Flight Simulator
FGS	Flight Guidance System
FLS	FMS Landing System
FMA	Flight Mode Annunciator
FMS	Flight Management System
FSB	Flight Standardization Board
GPWS	Ground Proximity Warning System
IEM	Interpretative / Explanatory Material
ICAO	International Civil Aviation Organisation

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I-NAV .....	Integrated Navigation Display
INS .....	Inertial Navigation System
JAA .....	Joint Aviation Authorities
JAR .....	Joint Aviation Requirements
JOEB .....	Joint Operational Evaluation Board
KCCU .....	Keyboard and Cursor Control Unit
LIFUS .....	Line Flying Under Supervision
LPC .....	Licence Proficiency check
LOFT .....	Line Orientated Flying Training
MCDU .....	Multi-Function Control Display Units
MDR .....	Master Difference Requirements
MDU .....	Multi-functions Display Units
MEL .....	Minimum Equipment List
MFTD .....	Maintenance Flight Training Device
MFF .....	Mixed Fleet Flying
MKB .....	Multi-functions Key Board
MLW .....	Maximum Landing Weight
MMEL .....	Master Minimum Equipment List
MTOW .....	Maximum Take Off Weight
NAA .....	National Aviation Authority
ND .....	Navigation Display
OEB .....	Operational Evaluation Board
ODR .....	Operation Differences Requirements
OIS .....	Onboard Information System (EFB)
OPS .....	Operations
ORI .....	Operational Review Item
PFD .....	Primary Flight Display
PDU .....	Primary Display Unit
PIC .....	Pilot In Command
SIC .....	Second In Command
TCAS .....	Traffic Alert and Collision Avoidance System
TAWS .....	Traffic Alert Warning System
TCCA .....	Transport Canada Civil Aviation
TRI .....	Type Rating Instructor
TRTO .....	Type Rating Training Organization
VGS .....	Visual Guidance System
VNAV .....	Vertical Navigation
ZFTT .....	Zero Flight Time Training
3EFF .....	Three Engine Ferry Flight

## Preamble

The initial operational evaluation of the A380-800 was performed by an integrated team composed of EASA/JAA, FAA and TCCA members. However this OEB report is only applicable to operations under the framework of EASA.

Emanating from the initial evaluation, this report specifies the EASA recommendations for training checking and currency requirements on the A380-800, as specified in JAR-FCL 1 and EU-OPS. The report also contains finding of operational acceptability of the A380-800 with regards to EU-OPS.

The OEB recommends the approval of:

- Airbus referenced ODR tables,
- Airbus proposed type rating courses (standard transition and CCQ courses)
- Airbus familiarization course.

The OEB recommends that the licence endorsement will be A380, and that a single licence endorsement (same type rating) applies to A380-840 series (Rolls Royce engines) and A380-860 series (Engine Alliance engines).

The OEB recommends that the attached conditions for Mixed Fleet Flying are accepted as being in compliance with JAR-FCL 1 and EU-OPS.

Additional specific items which are related to A380 Three Engine Ferry Flight (3EFF) operations were evaluated by a subsequent OEB and are incorporated in Revision 1 of this report.

The initial evaluation was conducted in accordance with the JAA Terms of Reference and the JOEB Handbook. The A380 3EFF evaluation was conducted in compliance with the applicable EASA OEB Handbook and Common Procedure Document (CPD) for conducting Operational Evaluation Boards.

18 July 2011



**Evan Nielsen**  
Head of Flight Standards Department  
Certification Directorate

**1. JOEB A380-800 FCL/OPS Subgroup Composition (Initial Evaluation)**

<b>Name</b>	<b>Capacity</b>	<b>Task</b>
Capt. Pete Griffiths	A380 JOEB Chairman - EASA	T2 - Evaluator
Capt. Pascal Riondel	EASA	T2 - Evaluator
Capt. Jim Kling	A380 FSB Chairman - FAA	T2 - Evaluator
Capt. Ron Tidy	A380 OE Chairman – TCCA	T2 - Evaluator
Capt. Robert Kostecka	TCCA	CCQ A330 to A380
Capt. François Collins	TCCA	CCQ A330 to A380
Capt. Yves-Marie Le-Maitre	EASA	CCQ A340 to A380
Capt. Joachim Fleger	EASA	CCQ A340 to A380
Capt. Jerry Ostronic	FAA	A380 Standard Transition
Capt. Dave Robinson	FAA	A380 Standard Transition
Capt. Alexander Fechner	EASA	A380 Standard Transition
Capt. Jean-Louis Françon	EASA	A380 Standard Transition
Capt. Scott Goccia	FAA	A380 Standard Transition
Capt. Terry Neale	EASA	A380 Standard Transition
Capt. Pete Neff	FAA	CCQ A320 to A380
Capt. Jim Harlow	EASA	CCQ A320 to A380
Capt. Fabrice Montier	EASA	CCQ A320 to A380
Capt. Markus Jaeger	EASA	CCQ A320 to A380

**2. OEB A380 FCL/OPS Subgroup Composition (3EFF)**

<b>Name</b>	<b>Capacity</b>	<b>Task</b>
Capt. Terry Neale	A380 OEB Chairman - EASA	Evaluator
Capt. Pete Griffiths	EASA	Evaluator
Jean-Claude Albert	EASA	Evaluator
Capt. François Fabre	EASA	Flight Test Pilot

## **Executive Summary**

### **1. Initial Operational Evaluation**

The initial Operational Evaluation (OE) was conducted jointly by the European Aviation Safety Agency (EASA), the Federal Aviation Administration (FAA), and Transport Canada Civil Aviation (TCCA) to simultaneously meet the JAA requirement for the JOEB, the FAA requirement for a Flight Standardization Board (FSB) and the Canadian requirement for an Operational Evaluation. Each Authority used the results of the evaluation process to produce a report specific to its particular requirements that, while similar in intent, differs somewhat in detail.

Airbus requested that the following to be evaluated:

- Initial A380 type rating courses:
  - Standard transition course
  - A320 to A380 CCQ
  - A330 to A380 CCQ
  - A340 to A380 CCQ
- A380-840 (RR engines) and A380-860 (EA Engines) differences
- A380 Familiarization course to cover engine differences
- Low visibility training

The operational Evaluation was conducted in accordance with:

- The JAA JOEB terms of reference
- The JAA JOEB handbook dated December 2002
- The JOEB OPS/FLC Common Procedure Document (CPD) for conducting Operational Evaluation Boards dated 10 June 2004, signed jointly by JAA, FAA and TCCA, and
- The FAA AC 120-53.

JAR requirements as in JAR-FCL 1 (§1.215, 1.220, 1.225, 1.230, 1.235 and 1.261 including associated appendices, AMC's and IEM's), and JAR-OPS 1 (§1.940, 1.945, 1.950, 1.970, and 1.980 including associated appendices, AMC's and IEM's) have been considered.

*Note: At the time of the initial evaluation the reference code was JAR-OPS 1. On 16 July 2008 EU OPS was implemented.*

The evaluation process started in January 2004 with a series of 7 meetings during which Airbus presented the operating philosophy and general system arrangements of the A380 to the JOEB, as well as the training development process and evaluation plan.

The first phase of the A380 joint evaluation by EASA, FAA and TCCA was completed by 1 June 2007. This first phase covered evaluation of the A380 Standard transition course (no previous Airbus Fly By Wire experience), as well as Cross Crew Qualification (CCQ) course from A330 and A340 towards A380

The first training course evaluation started on 16 April and involved 4 pilots as evaluators, 1 crew for the A330 to A380 CCQ, 1 Crew for the A340 to A380 CCQ and 3 crews for the standard transition course evaluation.

Sample Operator Difference Requirements (ODRs) between the A330, A340 and the A380 were proposed by Airbus as a basis for the evaluation. These ODRs were assessed and found acceptable by the Authorities. Some adjustments were incorporated following an A380 flight evaluation. System differences based on the ODR tables provided by Airbus were also assessed and found acceptable.

The second phase of the evaluation to complete the CCQ process was carried out jointly between EASA and FAA and ended on 7 February 2008. This phase covered the CCQ from the A320 to the A380 and also included a comparison of the A380-840 (RR Trent 900 engines) and the A380-860 (EA GP200 engines) to confirm that both variants were covered by the Same Type Rating (A380). The evaluation, which involved 2 pilots as evaluators and 2 crews for the A320 to A380 CCQ, took place at Toulouse between 14 January and 7 February.

Sample Operator Difference Requirements between A320 and A380, as well as between A380-840 and A380-860 were proposed by Airbus as a basis for the assessment of handling qualities and system differences between the variants. These were found acceptable by the Authorities, following a flight evaluation of handling qualities and comparison of systems differences.

The Authorities determined that level “B” differences training between the A380-840 (RR) and the A340-860 (EA) was acceptable and that the Ground courseware on CBT/Video/Transparencies is adequate to cover differences when transitioning from the A380-840 to the A380-860. Competency checks carried out in a simulator with either engine models are acceptable for both variants provided the differences are covered by an appropriate briefing.

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

- Issuance of same pilot type rating (single licence endorsement) for the A380-840 and the A380-860,
- Approval of the Airbus A380 Standard Transition course.
- Approval of the Airbus A320 to A380 CCQ course.
- Approval of the Airbus A330 to A380 CCQ course
- Approval of the Airbus A340 to A380 CCQ course.
- Approval of the Airbus A380 RR-EA familiarization course

- Acceptance of the enclosed recommendations for Mixed Fleet Flying as being in compliance with JAR-FCL1 and JAR-OPS1.

## **2. A380 Three Engine Ferry Flight (3EFF) Operational Evaluation**

In 2010, a subsequent OEB process was performed to evaluate additional specific items which are related to A380 3EFF operations. This included a review of the proposed Airbus documentation and training material, and simulator session to evaluate the 3 EFF training and procedures in June of 2010. A further simulator session carried out in August 2010 to simulate an actual 3 engine ferry flight from New York to Toulouse with diversion to London Heathrow was used to validate the training programme. A final conference was at EASA in Cologne on 8 March 2011 to review and close any outstanding items of the simulator based evaluation.

## **Operational Evaluation Report – FCL & OPS Subgroup**

### **1. Purposes and Applicability**

This report addresses:

- Type Rating assigned to the A380 family.
- Airbus family concept and A380 specifics.
- Master Differences Requirements (MDR) for crews requiring differences training
- Acceptable Operator Difference Requirements (ODR tables).
- Recommendations for initial training (Standard and CCQ)
- Recommendations for familiarization training course
- Recommendations for checking
- Recommendations for currency/ recent experience
- Recommendations for operations of more than one type (Mixed Fleet Flying)
- Recommendations for instructor training
- Additional operational recommendations

#### **Terminology:**

- Base aircraft: An operator designated aircraft or group of aircraft used as a reference to compare differences with other aircraft within an operator's fleet.
- The term "CROSS CREW QUALIFICATION" (CCQ) refers to a reduced type rating transition course which gives credit for the technical similarities and common operational and handling procedures. The term CCQ is reserved for such courses between Airbus fly-by-wire types.
- The term "STANDARD" type rating, as applied in this report, refers to the full transition programme (full type rating) for a given aircraft type.
- The term "MIXED FLEET FLYING" (MFF) is used in this report to outline the operations of more than one type in compliance with JAR OPS 1.980. In this context MFF refers to the operations of:
  - A330 & A380, or
  - A340 & A380.



## 2. Pilot Type Rating requirements

In accordance with JAR FCL1 Subpart F and the JOEB evaluation procedure, a new pilot type rating is assigned to the Airbus A380-800 and the designated pilot licence endorsement is: **A380**

Following evaluation of A380-840 series (RR engines) and A380-860 series (EA series) in accordance with JAR FCL1 Subpart F and the JOEB evaluation procedure, the same Type Rating and consequently the same licence endorsement (A380) is assigned to the A340-840 series and the A380-860 series.

Accordingly pilots completing the necessary training and testing in the A380-840 or A380-860 as per JAR- FCL 1, prescribed by this report, are assigned the “**A380**” type rating.

Unless otherwise specified “**A380**” means A380-840 or A380-860 variants throughout the report.

When discussing CCQ and MFF operations of A380 with other Airbus aircraft from the fly by wire family, any A320 variant is designated as "A-320", any A330 variant as "A-330" and any A340 variant is designated as "A-340"

This is as per Licence Endorsements defined in JAR FCL1 Subpart F:

Aircraft types & variants	Licence endorsement
A318 series A319-100 series A320-100 series -200 series A321-100 series -200 series	A320
A330-300 series -200 series	A330
A340-200 series -300 series -500 series -600 series	A340
A380-800 Series	A380

### **3. Airbus family concept and A380 specifics.**

The A380 design ensures that the following characteristics are similar to the A320, A330 and A340:

- 1) cockpit layout,
- 2) system operation, and
- 3) handling characteristics.

This level of commonality has a direct and significant impact on the design and construction of the training programmes.

#### **3.1 Cockpit Layout**

The cockpit arrangement has been designed to:

- provide similar panel arrangements
- provide similar controls (side stick, slats/slaps nomenclature, non-moving thrust levers))
- provide 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
- ECAM Engine/Warning and System displays provide similar information. The "READ and DO" concept minimises the impact of system dissimilarities, when dealing with abnormal and emergency operations. Crew response to CAUTIONS and WARNINGS incorporates the same philosophy.
- AUTO PILOT/FLIGHT DIRECTOR/AUTO THRUST incorporates similar architecture, and generally provides the same functions for auto-flight control

### **3.3 Handling Characteristics**

Although the size, gross weight, and aerodynamic characteristics of the various aircraft may differ, the Fly By Wire (FBW) system was designed to minimize the differences in terms of handling characteristics. This similarity in the flight control laws permits a significant level of commonality in handling qualities.

### **3.4 Commonality in aircraft operational philosophy**

The aircraft have been designed to permit commonality of procedures as far as possible:

- Similar normal procedures, even though the A380 has interfaces which are different when applying these procedures.
- Similar abnormal/emergency procedures dictated by ECAM (ECAM read and do list)
- Similar control location for emergency procedures
- Same task sharing rules (PF-PNF/CM1-CM2)

### **3.5 Altitude callout during landing**

Use of automatic voice callouts for landing is the same for A320, A330, A340 and A380 aircraft.

These callouts may be customized consistent with JARs for low visibility operations (JAR-AWO) in accordance with operator requirements. Unless otherwise agreed to by the NAA, operators seeking mixed fleet flying should standardize those callouts within the applicable fleets.

### **3.6 Automatic landing**

Because of the similarity among the autoland systems of the A320, A330 , A340 and A380 autoland training (including CAT II, III procedures) and qualification may occur in the A320 or A330 , A340 or A380 aircraft with differences training as specified by ODR tables.

### **3.7 Flight management system**

The FMS's functions are similar in the A320, A330, A340 and A380 aircraft. Training and qualification with the FMS on one type may be applied to other types, as specified by ODR tables, even though on the A380 the interface may be different.

### A380 Systems and Procedures Specific to the A380.

- New FMS interface using KCCU
- ECAM: implementation of electronic checklists and not sensed abnormal/emergency procedures
- New surveillance panel for Radar, TAWS, TCAS
- New OIS (Onboard Information System) including the following Airbus Application package:
  - o Electronic library (FCOM, FCTM, CCOM, MEL/CDL, AFM, WBM)
  - o Performance applications (TO, In Flight, Landing, W& B)
  - o AOC (Airline Operations Communication)

Note: additional applications like e-logbook, EFF and charts are scheduled to be available in the future on A380 OIS. For more information refer to JOEB EFB/OIS report)

### 3.9 Hazardous weather and winter operations

While specific operational differences are identified, precautions and procedures regarding hazardous weather/winter operations are similar for A320, A330, A340 and A380 aircraft. Nonetheless, differences training as applicable in the ODR tables should be carried out for the aircraft types and engine variants.

### 3.10 Aircraft Approach and circling categories

Ref: Appendix 2 to JAR-OPS 1.430(c)

Aircraft	Category
A318, A319, A320, A321*	C ( * A321 : C or D based on MLW of the variant)
A330	C
A340-200/300	C
A340-500/600	D
A380-800	C

#### 4. Master Differences Requirements tables

Master Difference Requirements for the A320/A330/A340 and A380 aircraft are shown in the table below. (For A320/A330/A340 family refer to dedicated CCQ & MFF JOEB report dated 12 March 2004)

Definitions of the various levels for Training/ Checking/ Currency are the ones from the JOEB handbook, and the relevant definitions are included after the table for reference.

TO FROM	A320	A330	A340	A380
A320	NA	E/E/D	E/E/D	E/E/D
A330	E/E/D	NA	E/E/B	E/E/D*
A340	E/E/D	B/E/C	NA	E/E/D*
A380	Not evaluated	Not evaluated	Not evaluated	NA
* See Para. 8 for detailed currency requirements				

***Difference level definitions Training/Checking/Currency extracted from the JOEB handbooks:***

#### **TRAINING LEVELS:**

***Level B Training.*** Level B difference training is applicable to functionally similar 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 standardised method of presentation of material, or to aid retention of material following training. Level B aided instruction typically employs such methods as slide/tape presentations, computer based training (CBT), stand-up lectures, or video tapes.

**Level E Training.** *Level E is training applicable to candidate aircraft having such significant "full task" differences that the equivalent of a full transition training course is required to meet the training objectives. The training requires a "high fidelity" environment to attain or maintain knowledge, skills, or abilities that can only be satisfied by use of a FFS certified to Level C or higher, or the aircraft itself. Level E training, if done in an aircraft, should be modified for safety reasons where manoeuvres can result in a high degree of risk (example: engine set at idle thrust to simulate an engine failure). As with other levels, when Level E training is assigned, suitable credit or constraints may be applied for knowledge, skills, and/or abilities related to other pertinent variants and/or types. Credits or constraints are specified for the subjects, procedures, or manoeuvres shown in JOEB reports and are applied through ODR tables.*

#### **CHECKING LEVELS:**

**Level E Checking.** *Level E checking indicates that a full proficiency check according to each authority's regulations/policy is conducted in a Level C or D FFS or aircraft for each variant following both transition and recurrent differences training. Alternating checks in accordance with national regulations are permitted. Credit for manoeuvres common to level E variants may also be permitted.*

#### **CURRENCY LEVELS:**

**Level B Currency.** *Level B currency is "knowledge related" currency, typically achieved through self-review by individual crew members for a particular variant. Self-review is usually accomplished by review of material provided by the operator to crew members for that purpose. It may be undertaken at an individual crew member's initiative, but the operator must identify the material and the frequency or other situations in which the material should be reviewed. Self-review may be based on manual information, bulletins, aircraft placards, memos, class handouts, video tapes, or other memory aids that describe the differences, procedures, manoeuvres, or limits for pertinent variant(s) that crews are flying.*

**Level C Currency** *Level C currency is applicable to one or more designated systems or procedures, and relates to skill as well as 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*

**Level D Currency.** *Level D currency is related to designated manoeuvres, and addresses knowledge and skills required for performing aircraft control tasks in real time, with integrated use of associated systems and procedures. Level D currency may also address certain differences in flight characteristics; including performance of any manoeuvres including related normal/ abnormal/emergency procedures for a particular variant*

## **5. Operator Differences Requirements Tables**

ODR tables are used to show an operator's compliance method. Detailed Airbus generic ODR tables are on file with EASA Certification directorate – Flight Standards.

Copies are available on request. These ODR tables are provided as Airbus generic, and therefore may not include items that are applicable to particular operators. The ODR tables assume that pilots are qualified, current and experienced in operating the base aircraft.

The Airbus ODR tables have been developed in accordance with AMC 1.980(b) & IEM 1.980(b) of JAR-OPS 1 Subpart N.

For establishment of ODR tables, a base aircraft must be selected. For A330 to A380 ODR table base aircraft is A330-200 enhanced, for A340 to A380 base aircraft is A340-300 enhanced, and for A320 Family to A380 base aircraft is A320.

These ODR tables have been found acceptable by the OEB. 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 flying “more than one type or variant” (Mixed fleet between A330, A340 and A380) must have approved ODR tables pertinent to their fleet.

## **6. Specification for Training**

### **6.1 Initial Transition course – A380 Type Rating**

#### **6.1.1. Prerequisites**

##### **6.1.1.1 A380 Standard Transition Course**

The A380 standard transition course is designed for pilots who have previous experience in commercial operations and have been previously qualified on multi-engine transport turbojet aircraft equipped with glass cockpit technology, including FMS.

### 6.1.1.2 A380 CCQ courses

Pilots who are designated to commence the CCQ course on the difference aircraft must be current, qualified (valid LPC) and experienced on the base aircraft.

Minimum experience on the base aircraft, as required by Appendix 1 to JAR-OPS 1.980 § 3, is 3 months and 150 hours on the base aircraft.

It is highly recommended that operators ensure that crews have a very good knowledge of base aircraft systems prior to commencing a CCQ course, as the flight training programme will only presents the differences between the 2 types.

*Note: Pilots without a valid LPC on the base aircraft may be eligible for CCQ via a refresher programme to be approved by their NAA.*

### 6.1.2 Training areas of special emphasis

These are divided as follows:

- features that apply throughout the Airbus fly by wire family and that should be considered as part of the “Standard Course” (6.1.2.1)
- features that are specific to the A380 and that should also be highlighted in the standard course, and more specifically during the CCQ programme (6.1.2.2).

6.1.2.1 In addition to the Airbus A380 specific features under § 6.1.2.2, all the following characteristics of the Airbus Fly by wire family should be emphasised during the A380 standard course as they have been identified in previous JOEB reports of the Airbus A320, A330 and A340 family.

- Fly by wire
  - Knowledge of flight characteristics and the degree of flight envelope protection provided by the various flight control laws for pitch, roll and yaw control.
  - Procedural and handling consequences following multiple failures that result in alternate and/or direct law.
  - Knowledge of the use of side stick controller with a special emphasis on the relationship between the two controllers and the transfer of control.
  
- Use of Flight Management System
  - Knowledge of the various modes of automation
  - Knowledge and skills related to MFD / FCU use
  - Recognition of mode awareness and transition modes through the FMA



- CRM issue linked to automation (task sharing and crosschecks)
  
- Use of ECAM
  - Knowledge of appropriate use of ECAM in conjunction with system failures
  - Crew discipline for ECAM actions: respect of the depicted procedure, crosscheck of irreversible actions, aircraft status analysis
  
- Auto Thrust system
  - Knowledge of the thrust control system in conjunction with the “non-moving throttles”
  - Recognition of all messages associated to Auto Thrust failure, engagement and disconnection

6.1.2.2 A380 Specific features that should receive special emphasis in an A380 initial pilot type rating training course as well as in CCQ courses:

- CRM:
  - Strict respect of SOP's when using FMS and OIS to avoid both pilots head down
  
- FMS / MFD:
  - New interface using the KCCU
  - Knowledge and use of new specific FMS features such as FLS function
  - Knowledge of back-up systems associated with the MFD such as software control of the FCU
  
- ECAM:
  - Use of normal electronic checklists
  - Management of not sensed failures using abnormal / emergency procedures and the distinction between sensed and non-sensed procedures
  
- Use of OIS
  - Take-off and landing performance computation in normal operations
  - Performance computation associated with ECAM aircraft status in abnormal / emergency conditions caused by aircraft systems failure(s).
  - Use of electronic library with a particular emphasis on how to use the MEL
  - Cross check of vital data and gross error checks

### 6.1. 3 Type rating course: Standard Transition course

The Airbus proposed type-rating training – A380 Standard transition course is in compliance with the AMC 1.261 (c) (2) of JAR-FCL 1 (A).

The course is divided into the following phases:

- Ground phase, including CBT and MFTD sessions, performance course and cabin trainer
- Systems and performance written test
- Simulator phase (including normal, abnormal and emergency procedures)
- LOFT phase
- Skill test (See checking Para. 7 for details)
- Flight phase (base training or ZFTT if applicable)

*Note: The footprint included in Annex 1 of this report only represents a typical A380 Standard course. Course structure and content at TRTO or Operator level may vary based on company specific training media and procedures.*

#### 6.1.4 A380 Type Rating courses – CCQ

The Airbus CCQ courses are built in accordance with the ODR tables, and are designed to transition pilots within the Airbus fly-by-wire family.

A CCQ course is a course that is designed to address the differences between the base aircraft and the difference aircraft (new type).

The Airbus proposed CCQ courses towards A380 have been assessed by the JOEB and found to be in compliance with the AMC 1.261 (c) (2) of JAR-FCL 1 (A) Subpart F and JAR-OPS 1.980.

The CCQ courses are divided into the following phases, as appropriate:

- Ground phase:
  - System study is achieved by CBT (Computer Based Training).
  - Performance course and cabin trainer
  - MFTD sessions including all items identified in the ODR tables
  - At the end of the CBT the system test is a full system test on the new type as for a standard type rating.
- Simulator Phase:
  - All items identified in the ODR tables must be trained.
- Skill test (See §7 for details)
- Flight Phase (base training or ZFTT if applicable)

*Note: ZFTT session content following CCQ is included in annex 4.*

- a) CCQ A330/A340 to A380

CCQ footprint and detailed content is identical whether the base aircraft is an A330 or an A340. The CCQ A330/A340 to A380 footprint is included in Annex 2 for reference and reflects the status of the Airbus A380 CCQ course at the time of the evaluation.

*Note: The footprint included in Annex 1 of this report only represents a typical A380 Standard course. Course structure and content at TRTO or Operator level may vary based on company specific training media and procedures.*

b) CCQ A320 to A380

The CCQ A320 to A380 footprint is included in Annex 3 for reference and reflects the status of the Airbus A380 CCQ course at the time of the evaluation.

*Note: The footprint included in Annex 1 of this report only represents a typical A380 Standard course. Course structure and content at TRTO or Operator level may vary based on company specific training media and procedures.*

## **6.2 A380 Familiarization course**

The JOEB has determined that the maximum level of differences that exist between the A380-840 series (R.R engines) and the A380-860 series (E.A engines) were level B as per accepted ODR tables.

Familiarization training is based upon clearly defined objectives and addresses all items as identified in the ODR tables validated by the integrated OE team in the joint evaluation.

Airbus familiarization course provided under CBT has been assessed and found acceptable.

## **6.3 Low visibility training**

Low visibility training is required by JAR-OPS 1.450. Under Appendix 1 to JAR-OPS 1.450 § (d), an abbreviated course may be acceptable subject to NAA approval for a pilot already experienced in low visibility operations.

In addition for a pilot qualified and experienced in low visibility operations on one of the Airbus fly-by wire aircraft, additional credit can be granted, subject to NAA approval, in accordance with low visibility ODR tables and the JOEB recommends the following:

- Between A320/A330/A340 and A380, one low visibility approach and landing should be included in the CCQ syllabi.

## **6.4 Recurrent training**

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

Both A380 variants are covered under the same licence endorsement and therefore, recurrent training on one variant is valid for the other, provided that the differences between variants are covered.

Differences between A380 variants are identified in ODR tables, as specified under JAR-OPS 1.980.

The differences between the A380 variants have been assessed as maximum to be level B. For variants at level B, recurrent training shall be addressed through aided instruction such as:

- Slide / tape presentations
- Computer Based Training (CBT) which may be interactive
- Video
- Classroom instruction

Consequently recurrent training can be conducted on any A380 simulator, provided that the differences identified in ODR tables are covered.

For Airbus Mixed Fleet Flying considerations, refer to paragraph 11.

## **7. Specification for Checking**

### **7.1 Skill test following type-rating courses (Standard course or CCQ course)**

In addition to the mandatory items from the skill test as per Appendix 2 to of JAR-FCL 1.240 the following features must be checked:

- Use of side-stick controller
- Knowledge of the various modes of automation
- Knowledge and skills related to the use of MFD/ KCCU / FCU and crosschecks using the FMA
- Use of ECAM: electronic checklists, abnormal/emergency not sensed procedures
- Use of auto thrust system
- Use of OIS
- Use of FLS landing system.

## **7.2 Recurrent Checks**

Proficiency checks must be conducted in compliance with JAR-FCL 1.245 and JAR-OPS 1.965. The JOEB confirms that a proficiency check conducted on one A380 variant is valid for both variants, 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 A380 simulator.

For Airbus Mixed Fleet Flying considerations, refer to paragraph 11.

## **7.3 Line checks**

As all A380 variants share same type rating (single licence endorsement), a line check on any of them is valid for both.

For Airbus Mixed Fleet Flying considerations, refer to paragraph 11.

## **8. Specification for Currency / Recent experience**

Compliance with JAR-OPS 1.970 or JAR-FCL 1.026 as appropriate is required for recent experience.

Concerning the A380 family, JOEB concluded that take-offs and landings performed on one A380 variant, within ninety days, are valid for all variants. This means that for pilots flying more than one A380 variant, the recent experience requirement is satisfied as soon as they achieve 3 take-offs and landings, as handling pilot, regardless the variant flown.

For Airbus Mixed Fleet Flying considerations, refer to paragraph 11.

## **9. Specification for LIFUS**

### **9.1. Line Flying Under Supervision (LIFUS)**

There are a variety of reasons why the JOEB may specify LIFUS in conjunction with Master Difference Requirements (MDR). 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,);

- c. Introduction of new operation (e.g. oceanic operation);
- d. Experience for a particular crew position (e.g. PIC, SIC, F/E);
- e. Post qualification skill refinement (e.g. refining alternate or multiple ways to use particular equipment to increase operating efficiency, operating flexibility, or convenience);
- f. Special characteristics (e.g. unique airports, mountainous areas, unusual or adverse weather, special air traffic control procedures, non-standard runway surfaces, etc.)

### 9.2 LIFUS following A380 Standard type rating course

In the case of an initial type rating onto the A380, a minimum of 10 sectors including a line check is recommended for Line Flying Under Supervision (LIFUS), meaning 8 sectors plus 2 sectors line check.

Where there is a change of operating conditions or route structure this should also be taken into account and may need the addition of sectors to cover these elements.

### 9.3 LIFUS following A380 CCQ

Pilots completing the A380 CCQ may, subject to NAA approval, undertake a reduced number of sectors. Based upon ODR tables, the JOEB recommend the following table.

Base training (aircraft) or Zero Flight Time Training (Simulator)			
	Sectors – CCQ A330 or A340 to A380	Sectors – CCQ A320 to A380	A380 Line checks
LIFUS Standard	3 PF 4 Sectors 1 PNF	5 PF 6 Sectors 1 PNF	1 PF 2 Sectors 1 PNF
See Note 1 below	1 PF 2 Sectors 1 PNF		

Note 1: The number of sectors may need to be increased if mission and operational procedures are assessed to be different (e.g. oceanic, polar vs. short haul domestic routes/operations) and if those elements are not covered during the sectors flown under the “LIFUS Standard” requirement.

Note 2: A sector is defined in JAR-FCL1 to be a flight comprising take-off, departure, cruise of not less than 15 minutes, arrival, approach and landing phases.

Under Zero Flight Time Training ( ZFTT ), the first 4 sectors of LIFUS is to be conducted by a Type Rating Instructor. LIFUS training must be commenced within 21 days after the skill test.

In case of base Training completed in an aircraft, the LIFUS is to be conducted by a flight crewmember nominated by the Operator and acceptable to the Authority.

### **10 Type Rating Instructor training**

JAR-FCL 1.365(b), the JOEB recommends the following:

For a TRI already qualified and current as TRI on one of the Airbus types (A320, A330, A340), to qualify for an additional Airbus TRI qualification, the instructor must:

- hold the type rating of the new aircraft (CCQ programme),
- have completed the relevant LIFUS
- have completed the 15 sectors as per JAR-FCL 1.365(b)(1)

The JOEB considers that there is no need to repeat on the new type, the requirements from JAR-FCL 1.365(b)(3), provided that the TRI is familiar with the operation of the relevant simulator.

The above does not remove any TRI restriction.

### **11. Specification for Operations of more than one type – MFF (Mixed Fleet Flying)**

Below are listed the JOEB recommendations for operators to conduct Mixed Fleet Flying with the Airbus fly-by-wire family of aircraft. (Long range aircraft only)

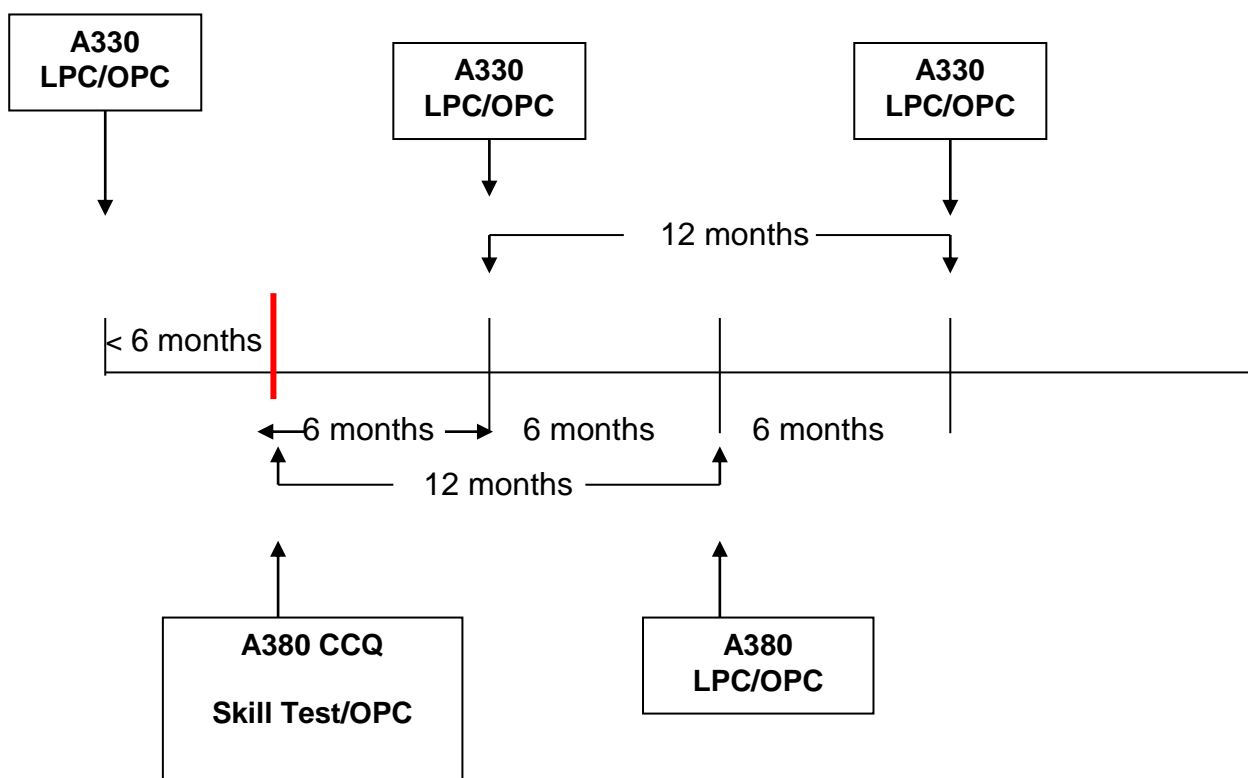
#### **11.1 Prerequisites**

Prerequisites for flying more than one type (Mixed Fleet Flying – MFF) are set up in JAR-OPS 1.980. Typically it consists of a consolidation period following the initial line check on the new type of 50 flying hours or 20 sectors, to be achieved solely on aircraft of the new type rating.

## 11.2 Recurrent training and proficiency checks

Recurrent training should comply with JAR-OPS 1.965. However under MFF, for operations of more than one type, JAR-OPS 1.980 applies.

In accordance with Appendix 1 to JAR-OPS 1.980 §(d)(7)(i), an alternate recurrent training and checking programme can be established. Therefore, the NAA 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 JAR-OPS 1.980 (see § (d)(7)(i)),

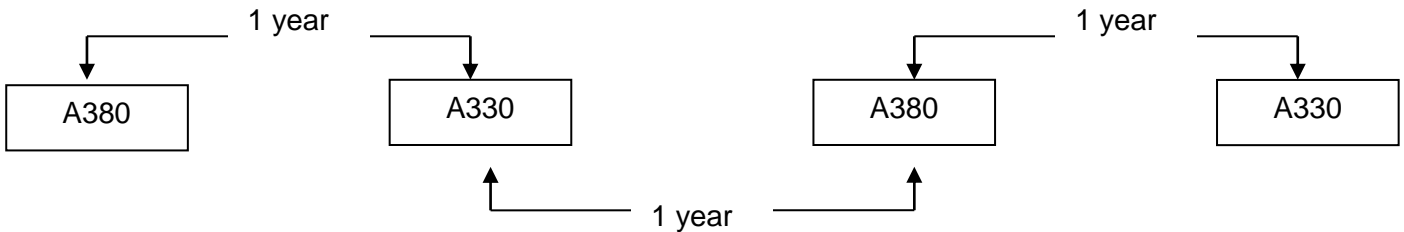
*Note: Concerning the recurrent training for low visibility operations, the OEB team considers that full credit applies between types, provided that low visibility training is conducted during recurrent training every 6 months*



### 11.3 Line checks

Line checks are required in compliance with JAR-OPS 1.965 (c), however, for MFF credit may be given in accordance with Appendix 1 to JAR-OPS 1.980 § (d)(7)(ii), The OEB considers that alternating line checks between types is acceptable.

For example



Each line check revalidates the line check for the other type flown under MFF.

### 11.4 Currency / Recent experience

Compliance with JAR-OPS 1.970 or JAR-FCL 1.026 as appropriate is required for recent experience. Under Mixed Fleet Flying, JAR-OPS 1.980 applies.

In compliance with Appendix 1 to JAR-OPS 1.980 § (d) (5) & (7), and based on feedback from all OEB members and initial operating crews, the OEB recommends the following:

MIXED FLEET FLYING Aircraft types	CURRENCY/RECENT EXPERIENCE Requirements
(A330 or A340) and A380	- 3 take-offs and landing in either (A330 or A340) or A380 - 1 take-off and landing in each type <b>every 45 days</b> .

Re-establishing currency /recent experience: When currency is lost, currency may be re-established by a training flight or use of a flight simulator of the aeroplane type to be used

## **12 Additional Operational recommendations**

### **12.1 Aircraft Evacuation at the airport gate.**

An evacuation demonstration with 853 passengers plus 18 crew was carried out on 26 March 2006 in accordance with CS25-803. The demonstration was satisfactory as all passengers and crew were evacuated well within the 90 seconds time limit. More details on A380 Cabin aspects are contained in the A380 JOEB Cabin Crew report dated 22 August 2007. Clearly, the A380 has an adequate number of emergency exits and will be operated by most airlines with far less than the 853 passengers used for the demonstration. However, even in a typical airline “3 class” configuration the number of passengers carried will still be in excess of 500. Operators should therefore ensure that they have contingency plans in place, which have been agreed with the airport operator. These contingency plans should include procedures for evacuation at the gate where some exits may be obstructed by ground equipment and where it may be necessary or preferable to evacuate the passengers back into the airport terminal.

### **12.2 Refuelling with passengers on board.**

Refuelling with passengers on board is not recommended but where this is necessary for operational reasons, operators should have contingency plans in place to stop the refuelling and, if necessary disembark or evacuate the passengers from the aircraft in the event of a fuel spillage or fumes in the aircraft.

### **12.3 Pre-departure External Check**

The double deck arrangement of the A380 means that special ground handling equipment needs to be used in order to clean and cater the aircraft for service. Some of this equipment is, by necessity, remote from the driver/operator of the equipment and is also used in close proximity to the aircraft wings and engines. The possibility of this equipment coming into contact with the aircraft structure is therefore probably greater than with other large commercial aircraft and there is also more chance that if any damage is caused it may go unnoticed. It is therefore recommended that the pre-departure external check is carried out by a suitably qualified person after catering and cleaning and any other ground servicing has finished.

## **12.4 Operation from 45 metre runways.**

In accordance with ICAO classification for airfield design, the A380 would be classified as requiring code “F” runways. However, the key parameter (outer main gear wheel span) exceeds the ICAO limit by only a very small margin (~2%).

The A380 has been certified for operations on 45m wide runways in agreement with EASA and FAA, and the A380 Flight Manual includes in the limitations section –operational parameters the following statement:

“The aircraft has been shown to be safely controllable and to be compliant with applicable airworthiness requirements when operating on runways with a width of 45m (150ft) or more.”

The operational evaluation was carried out using 45m runways with no special training required or necessary.

As with the A340-600 and B777-300 (similar wheel bases), it is not possible to perform a 180-degree U-Turn on a 45 metre runway but this operation was demonstrated to the OEB using a suitable turn pad at the end of a 45m wide runway.

The aircraft presents no particular difficulty during ground taxiing and is aided by the ETACS where fitted. However, operators should ensure that taxiway routes to be used are suitable for the A380 and have been cleared as such by the airfield operator.

## **13 A380 Three Engine Ferry Flight (3EFF)**

### **13.1 Introduction**

The operator/holder of the Air Operator’s Certificate (AOC) is responsible for obtaining operational approval for the 3 Engine Ferry Flight (3EFF) from the National Aviation Authority.

The operator must refer to the manufacturer’s approved documentation which provides the conditions to perform the 3EFF operation. This includes the Aircraft Flight Manual (AFM) the MMEL and the Flight Crew Operating Manual (FCOM). Reference should also be made to the Airbus Flight Crew Training Program (FCTP) and the recommended Standard Operating Procedures for 3 Engine Ferry Flights. Cross reference to these documents should be made when developing the operators own SOPs, MEL and briefing guides to ensure that all the relevant requirements have been met.

### **13.2 Crew qualification and training**

The 3 EFF approval should be supervised by a nominated post holder for flight operations or crew training and this should be included in his/her terms of reference. To ensure a safe preparation and management of an A380 3 Engine Ferry Flight, the following requirements and training should be applied.

### **13.2.1 Crew prerequisites**

The flight crew members must be qualified, current, and experienced on A380 (minimum 150 flying hours) and be specifically designated to carry out 3EFF operations. Both flight crew members shall be qualified instructors on A380.

### **13.2.2 Crew training**

#### Initial training / qualification

Before conducting a 3EFF operation, all crew members shall follow the approved A380 “THREE ENGINE FERRY FLIGHT” course (Airbus course reference LF26).

The training must be conducted by an instructor who has completed the 3EFF training course. This instructor must also observe a 3EFF training session or be supervised by a qualified 3EFF instructor when conducting his first training session.

#### Prior to any actual Three Engine Ferry Flight

Prior to conducting any Three Engine Ferry Flight, all crew members must perform a simulator session in order to practice handling techniques and operational items. This practice session will use the forecast weather conditions, the actual aircraft conditions (inoperative engine, aircraft weight, etc.) and, ideally, the airport from which the Three Engine Ferry Flight will depart.

#### Briefing and Simulator session

Prior to the simulator session a dedicated briefing should be set up. It should include the following key points:

- Technical condition of the aircraft - MEL
- Performance computation
- Operating Limitations
- CG and TRIM setting
- Weather minima
- 3EFF operating procedures
- ECAM messages
- Takeoff procedures - Runway lineup
- Thrust setting procedures, highlighting the importance of coordination and communication between crewmembers. It is important that the recommended thrust setting is achieved at each speed “gate” so that the required take off performance is met.
- 2<sup>nd</sup> Engine failure procedure and performance implications

### **13.3 Three Engine Flight procedures**

#### **13.3.1 Technical condition of the aircraft**

The inoperative engine must be configured in a specific condition by the maintenance crew as per Aircraft Maintenance Manual procedures (i.e. in windmilling or in core blank condition).

The 3 operative engines must be inspected by the maintenance crew as per Aircraft Maintenance Manual procedures.

Other systems must be configured or set in specific position for the flight.

Reference must be made to the AFM and FCOM.

#### **13.3.2 MEL**

Some aircraft systems are required operative prior to dispatch. The Three Engine Ferry Flight is limited to 3 sectors without passengers and without any freight that would not belong to the 'spare parts kit'.

Reference must be made to the MEL.

#### **13.3.3 Flight planning and weather conditions**

A careful study of the route has to be performed. Weather minima for actual and forecast weather conditions should be considered. Icing conditions must be avoided. During the en-route phase, all obstacles should be cleared if a second engine should fail, and at all times the aircraft should not be further from a suitable alternate than the distance flown in 240 minutes at the two engine-inoperative cruise speed.

For suitability of the weather conditions, the OEB recommends a minimum ceiling of 1000ft and a minimum visibility of 3 kilometres at departure, destination and alternate airports.

#### **13.3.4 Performance**

The RTOW performance determination differs from that normally applied for public transport operations. Careful reading of the PERFORMANCE chapter in the FCOM – Special operations – Three Engine Ferry Flight is mandatory.

The performance application on board of the aircraft (OIS/OIT) can be configured for 3 Engine Ferry Flight with the failed engine condition. Refer to operator procedures to set up the application.

The 3 Engine Ferry takeoff, en route net flight path, go-around and landing performance must be determined by using the performance application and selecting the 3 Engine Ferry Flight case.

Reference must be made to the AFM and FCOM.

Special note should be taken of the implications of Vstop compared to V1. Vstop is the speed to which the aircraft can be accelerated with all serviceable engines operating, and brought to a full

stop within the accelerate-stop distance available. Full handling accountability with regard to the failure of the serviceable engine is provided from  $V_r$ , whilst permitting a reduced level of performance, less than that normally assumed by CS 25. It is considered suitable for non-revenue, non-passenger operations to return the aircraft to a place where an engine may be repaired or changed. At or above  $V_{stop}$  and with a second engine failure, the decision should always be to continue the take-off, as the crew has no means to predict at which speed the aircraft will cross the runway end in case of takeoff abortion above  $V_{stop}$ .

### **13.3.5 Operating Limitations**

Take off is only authorised on a dry or wet runway. It is not authorised on a contaminated runway. The maximum crosswind allowed for take-off is 10kt.

Slats/flaps configuration for take-off is 1+F only.

Avoid icing conditions.

Reference must be made to the AFM, MMEL and FCOM.

### **13.3.6 Operating Procedures**

Specific operating procedures must be applied for the following:

- Aircraft line-up
- Rudder Trim Setting
- Thrust application

Reference must be made to the AFM and FCOM.

The OEB recommends that operators consider developing callouts for the thrust setting procedure which would provide the Pilot Flying (PF) with sufficient information to increase the thrust on the asymmetric engine appropriately during the take-off roll. Emphasis on crew coordination and communication should be part of the briefing, as listed above. This is required because the handling pilot's attention is focused outside in order to maintain directional control during the asymmetric thrust application. The non-handling pilot will therefore need to monitor the engine thrust settings at defined speeds (speed gates) and call these out to the handling pilot.

# Annex 1

## Typical A380 Standard Transition Course footprint

Day 1	Day 2	Day 3	Day 4	Day 5
CBT (7:20)	CBT (6:00)  MFTD A (2:00)	CBT (4:00)  MFTD B (4:00)	CBT (4:00)  MFTD C (4:00)	CBT (6:00)  MFTD D (2:00)
Day 6	Day 7	Day 8	Day 9	Day 10
APPI (2:30)  CBT (5:30)	CBT (2:40)  OIS & PERFORMANCE (5:00)	CBT (1:10)  MFTD 1 (4:00)	MFTD 2 (4:00)	MFTD 3 (4:00)
Day 11	Day 12	Day 13	Day 14	Day 15
MFTD 4 (4:00)	MFTD 5 (4:00)	MFTD 6 (4:00)	CEET safety presentation self study (1:00)  - Cabin presentation (ATA 25) 0:25  MFTD 7 (Progress Check) (4:00)	Systems Test (4:00)  Performance Test (2:00)  Door Trainer (1:00)
Day 16	Day 17	Day 18	Day 19	Day 20
FFS 1 (4:00)	FFS 2 (4:00)	FFS 3 (4:00)	FFS 4 (4:00)	FFS 5 (4:00)
Day 21	Day 22	Day 23	Day 24	Day 25
FFS 6 (4:00)	FFS 7 (4:00)	LOFT (4:00)	Skill Test (4:00)	LOW VIS (4:00)

## Annex 2

### Typical CCQ A330/A340 to A380 footprint

Day 1	Day 2	Day 3	Day 4
<b>CBT</b> (6:30)	<b>CBT</b> (5:20)  <b>MFTD A</b> (1:30)	<b>CBT</b> (7:00)	<b>CBT</b> (1:00)  <b>OIS &amp; Performance</b> (5:00)
Day 5	Day 6	Day 7	Day 8
<b>CBT</b> (3:20)  <b>MFTD 1</b> (4:00)	<b>CBT</b> (3:10)  <b>MFTD 2</b> (4:00)	<b>CBT</b> (2:50)  <b>MFTD 3</b> (4:00)	<b>CBT</b> (1:30)  <b>Cabin Trainer</b> (1:00)  <b>System Test</b> (4:00)
Day 9	Day 10	Day 11	Day 12
<b>Briefing</b> (1:30)  <b>FFS 1</b> (4:00)	<b>Briefing</b> (1:30)  <b>FFS 2</b> (4:00)	<b>Briefing</b> (1:30)  <b>FFS 3</b> (4:00)	<b>CBT</b>  <b>Walk around 3D</b> (1:30)  <b>FFS - Skill Test</b> (4:00)
<b>Base Training (0:45 / trainee) or ZFTT (FFS : 4:00 / crew) if applicable</b>			



## Annex 3

### Typical CCQ A320 to A380 footprint

Day 1	Day 2	Day 3	Day 4	Day 5
<b>CBT (6:30)</b>	<b>CBT (5:20)</b> <b>MFTD A (1:30)</b>	<b>CBT (7:00)</b>	<b>CBT (1:00)</b> <b>OIS &amp; Performance (5:00)</b>	<b>CBT (3:20)</b> <b>MFTD 1 (4:00)</b>
Day 6	Day 7	Day 8	Day 9	Day 10
<b>CBT (3:10)</b> <b>MFTD 2 (4:00)</b>	<b>CBT (2:50)</b> <b>MFTD 3 (4:00)</b>	<b>CBT (1:30)</b> <b>Cabin Trainer (1:00)</b> <b>System Test (4:00)</b>	<b>Briefing (1:30)</b> <b>FFS 1 (4:00)</b>	<b>Briefing (1:30)</b> <b>FFS 2 (4:00)</b>
Day 11	Day 12	Day 13		
<b>Briefing (1:30)</b> <b>FFS 3 (4:00)</b>	<b>Briefing (1:30)</b> <b>FFS 4 (4:00)</b>	<b>CBT</b> <b>Walk around 3D (1:30)</b> <b>FFS -Skill Test (4:00)</b>		
<b>Base Training (0:45 / trainee) or ZFTT (FFS : 4:00 / crew) if applicable</b>				

## Annex 4

### **Zero Flight Time Training following A330/A340 CCQ**

The session must include the following:

- Taxi
- 4 Take-offs
  - o One at MTOW
  - o One with cross wind
- 4 Landings
  - o One at MLW
  - o One with cross wind

***Note: If the course is not approved for Zero Flight Time Training, 4 landings on the aircraft would also be required.***