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Subject: AIRCRAFT GROUPINGS FOR RATING AND TRAINING REQUIREMENTS

1. INTRODUCTION

1.1 To cater for the specific commercial demands of different regions and markets, the aircraft manufactures have, for some time, been manufacturing different variants of the same aircraft to cater for factors like higher payload, greater range etc. Alongside, the evolving high technology has resulted in stark similarity and commonality in the cockpit environments. As a consequence, the industry has adopted the practice of pilot licences being endorsed with one Rating indicating simultaneously the different variants.

1.2 However, contrary to the common belief, this one Rating, indicating all the variants, does not automatically authorize a pilot to fly a variant without meeting the necessary additional requirements. Even the currency is identified on a specific variant.

2. LEVELS OF TRAINING REQUIRED

2.1 The different levels of training required, namely A, B, C, D and E, are indicated on the chart given below.

Difference Level	Method/Minimum Training Device
A : Represents knowledge requirement	Self-instruction through operating bulletins or differences handouts.
B : Aided instruction is required to ensure crew understanding, emphasize issue, aid retention of information, or: Aided instruction with partial application of procedures	Aided instruction e.g. computer based training (CBT), classroom instruction or videotapes.

<p>C : For variants having part task differences affecting skills or abilities as well as knowledge. Training device required to ensure attainment and retention of crew skills</p>	<p>System device Interactive CBT</p>
<p>D : Full task differences affecting knowledge, skills and/or abilities requiring devices capable of performing flight manoeuvres</p>	<p>Flight Training Device</p>
<p>E : Full tasks differences requiring high fidelity environment to attain and maintain knowledge skills and abilities</p>	<p>Flight Simulator/Aircraft</p>

Note: Level A and B require only familiarization training. Level C and D require differences training. Level E requires full type-rating training. For level E, the nature and extent of the differences are such that training in a full flight simulator or aeroplane is required, thus level E implies a different type rating.

3. PROCESS OF GROUPING

3.1 The following should be considered when a new aeroplane or variant is introduced:

- a) assessment of a type rating based on manufacturer proposal;
- b) approval of the proposed type rating course;

3.2 Definitions.

- a) Base Aeroplane: An aeroplane, or a group of aeroplanes used as a reference by a manufacturer to compare differences with other aeroplane types/variants.

4. TYPE RATING ESTABLISHMENT

4.1 The methodology for assessment of type rating is initiated when a manufacturer presents an aeroplane for type certification as a new type or variant of an existing type. The type rating and crew qualification requirements should

be set at the time of type Certification and prior to the aeroplane entering into service.

- 4.2 To begin the evaluation, the manufacturer should first nominate one aeroplane as the base aeroplane from which to show differences with the second aeroplane.
- 4.3 One key issue with regard to consideration of a single licence endorsement for 2 aeroplanes is related to the Certificated minimum flight crew complement. If the minimum flight crew complement specified in the Aeroplane Flight Manual is not the same for the two aeroplanes considered, then the same type rating cannot be achieved.
- 4.4 A comparison must then be performed between the base aeroplane and the difference aeroplane in terms of technology (systems), procedures, pilot handling and aeroplane management. These differences are compiled in an ODR table (Operational Differences Requirements), which constitutes part of the justification for the assessment of the type rating.
- 4.5 Based on the above analysis (including preliminary flight test results and/or flight simulation estimates, the Manufacturer will propose "difference levels" in the Master Difference Requirements (MDR) table for the various model pairs. The manufacturer will propose a plan for validation of the similarities and difference levels, including validation of the manufacturer's proposed training program.
- 4.6 The final stage of the process for type rating assessment is related to the comparison of handling characteristics between the base aeroplane and the difference aeroplane.
- 4.7 Following the completion of evaluation, the results and findings form the process, with regard to type rating assessment, of recommending groupings and additional training requirements.

5. **TYPE RATING COURSE APPROVAL**

- 5.1 Manufacturer's proposal for the basic type-rating course shall be validated.
- 5.2 Operational differences between the different variants shall be established in accordance with the guidelines given in the subsequent paragraphs.
- 5.3 The level of differences between the two aeroplanes will determine the amount of theoretical and practical training; and the required training.

6. FACTORS AFFECTING EVALUATION

6.1 General characteristics and level of technology:

- a) The general characteristics of the difference aeroplane should be compared with the base aeroplane with regards to:
 - i) General dimensions and aeroplane design; and aerodynamics considerations,
 - ii) Flight deck general design, instrumentation and layout,.
 - iii) Cabin layout.
 - iv) Engines (number, type and position)
 - v) Limitations (flight envelope).
- b) Level of technology: The level of technology of each aeroplane under consideration encompasses at least the following design aspects:
 - i) Flight deck layout (e.g. design philosophy chosen by a manufacturer);
 - ii) Mechanical versus electronic instrumentation
 - iii) Presence or absence of Flight Management System (FMS),
 - iv) Conventional flight controls (hydraulic, electric or manual controls) versus fly by wire.
 - v) Side stick versus conventional yoke,
 - vi) Pitch trim systems,
 - vii) Engine type and technology level (e.g. turbofan/turbojet/turboprop/piston, with or without automatic protection systems.

6.2 OPERATIONAL DIFFERENCES.

- a) Consideration of operational procedures involve mainly the pilot machine interface, and the compatibility of the following.
 - i) Paper checklist versus automated display of checklists or messages (e.g. ECAM, EICAS) during all procedures,
 - ii) Manual versus automatic selection of Nav aids

- iii) Navigation equipment,
 - iv) Aeroplane weight and performance.
- b) Operational differences encompass normal, abnormal and emergency situations; and include any change in aeroplane handling and flight management. It is necessary to establish a list of operational items for consideration on which an analysis of differences can be made. The operational analysis should take the following into account:
- i) Flight deck dimensions, (e.g. size, cut off angle and pilot eye height);
 - ii) Differences in controls (e.g. design, shape, location, function);
 - iii) Additional or altered function (flight controls) in normal or abnormal conditions,
 - iv) Procedures,
 - v) Handling qualities (including inertia) in normal and in abnormal configurations,
 - vi) Performance in manoeuvres,
 - vii) Aeroplane status following failure,
 - viii) Management (e.g. ECAM, EICAS, Nav aid selection, automatic checklists)

6.3 HANDLING CHARACTERISTICS

6.3.1 Consideration of handling characteristics include control response, crew perspective and handling techniques in all stages of operations. This encompasses flight and ground characteristics as well as performance influences (e.g. number of engines). The capabilities of the auto pilot and auto-thrust systems may affect handling characteristics as well as operational procedures.

7. AIRCRAFT GROUPS & TRAINING REQUIREMENTS

7.1 The under mentioned chart gives the accepted aircraft groupings and training requirements; and the specific Endorsement on the Licence.

7.2 The symbol (D) in column 3 indicates that differences training is required when moving between variants or other types of aeroplane which are separated by the use of a line in column 2, for example: -

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
Boeing	B737-300 series -400 series -500 series	(D)	B737 300-800
	-600 series -700 series -800 series		

Note:

- (a) A licence holder passing a skill test on the B737-400 is required to undergo differences training in order to operate the B737-800, and vice versa.
- (b) Although the licence endorsement (column 4) contains all Aeroplanes listed in column 2, the required familiarization or differences training has still to be completed;
- (c) The specific variant on which the skill test for the type rating has been completed will be appropriately recorded on the CAA Flight Check report.
- (d) The chart given below only indicates the training requirement for the Difference Level 'D'. The Operator is to assess and propose to the CAA, for approval, the training requirements for the variants falling in the category of Difference Levels A, B and C.**

7.3 MULTI-PILOT AEROPLANES

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
Aerospatiale/Sud Aviation	SN601 Convertte		SN601
	SE 210 III	(D)	SE210/10B3/11/12

	IIR VIN SE 10B3		
	SE 11		
	SE 12		
Aerospatale/B AC	Concorde		Concorde
Aerospatale/No rd Aviation	Nordatlas 2501		ND 25
	C160 P Transall		ND 16
	260A Nord 262 A-B-C Nord		ND 26
Aero Spaceline	377 SGTFF Super Guppy		Super Guppy
Airbus	A300-B1 -B2 series -B4 series -C4-200 series -FF4-200 series		A300
	A300-FFCC		A300FFCC
	A310-200 series -300 series A300-B4 600 series -C4 600 series -F4 600 series		A310/300-600
	A319-100 series A320-100 series -200 series A321-100 series -200 series		A319/320/321
	A330-300 series -200 series		A330
	A340-200 series -300 series		A340
	A300- 600ST/Beluga		A300-600ST
	ATR	ATR 42 series 72 series	(D)
Mitsubishi/Bee ch/ Raytheon 1 Manufacturer	Beech 400 Series MU 300		Beech400MU300
	2 Aeroplanes	3	4 Licence endorsement
Boeing	707-100 series -300 series B720 B717 series	(D)	B707/720 B717
	B727-100 series		B727

	-200 series		
	B737-100 series -200 series		B737 100-200
	B737-300 series -400 series -500 series	(D)	B737 300-800
	-600 series -700 series -800 series		
	B747-100 series -200 series -300 series -SP	(D)	B747 100-300
	B747-400 series		B747 400
	B757-200 series -300 series	(D)	B757/767
	B767-200 series -300 series		
	B777-200	(D)	B777
	B777-300		
British Aerospace / AVRO	ATP Jetstream 61		BAe/ATP/Jetstream 61
	AVRO RJ series		
	146-100 series -200 series -300 series		AVRORJ/BAe146
British Aerospace / AVVRO	BAC 1-11-200 series -400 series -500 series		BAC 1-11
	Bae 125-800 series -1000 series	(D)	HS 125
Hawker Siddeley/ Bae/Raytheon	HS 748 series		HS 748
Hawker Siddeley / Bae	Jetstream 3100 series 3200 series		Jetstream 31/32
Bae / Avro	Jetstream 41		Jetstream 41
1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
Canadair	CL 415		CL 415
	CL 600 CL 601-1AA CL 601-3A		CL600/601
	CL 600-B19		CLRJ 100
	CL 600-2B16		CL604

Casa	C-212 series CN-235		C212/CN235	
Cessna	C 500	(D)	C500/550/560	
	C 550			
	CS 550			
	C560			
Consolidated Vultee Aircraft	C650 Citation III Citation VII		C650	
	C750 Citation X		C750	
	CV 240-4 CV 340 CV 440		CV 240/340/440	
Dassault	CV 580		CV580	
	Falcon 10	(D)	Falcon 10/100	
	Falcon 100			
	Falcon 20 series	(D)	Falcon 20/200	
	Falcon 200			
	Falcon 50	(D)	Falcon 50/900	
	Falcon 900			
De Havilland- Canada	Falcon 900 Ex			
	Falcon 2000		Falcon 2000	
	DHC7		DHC 7	
	DHC8-100 series -300 series		DHC8	
	DHC8-400 series		DHC8 400	
	Dornier	DO 328-100		DO328-100
		DO 328-300		DO328-300
McDonnell- Douglas	Douglas A-26B		DCA26	
	Douglas -3A- S1C3G		DC3	
	DC4		DC4	
	DC6 series		DC6	
	DC7C		DC7	
McDonnell- Douglas/Boeing	DC8-33 -50,60,70 series		DC8	
	DC9 10-5- series		DC9 10-50	
	DC9 80 series	(D)	DC9 80/MD88/MD90	
	MD 88 series MD 90 series			
	1 Manufacturer McDonnell- Douglas/Boeing	2 Aeroplanes	3	4 Licence endorsement
		DC10 series		DC10
	MD 11		MD 11	
Embraer	EMB 120RT Braasiliaaa		EMB120	
	EMB 135 Regional Jet		EMB135	
	EMB 145 Regional Jet		EMB 145	

Fokker/Fairchild	FH227 F27 A/F/J F27 series		F27
	F28 series		F28
	F50		F50
	F70 F100		F70/100
	Grumman Gulfstream	Grumman G-159	
Grumman G-1159		(D)	Gulfstream II/III
Grumman G-1159A			
Gulfstream 1159C			Gulfstream IV
Gulfstream V			Gulfstream V
Handley Page	Herald series		Herald
Israel Aircraft Industry	IAI - 1121 Jetcommander -1123 Commodore Jet -1124 Westwind		IAI1121/23/24
	IAI-1125 Astra		IAI1125
Junkers	Junkers 52		JU52
Lockheed	L188 Electra series A	(D)	L188 Electra
	L188 Electra series C		
	L328 G (C 130)		Hercules
	L1011 series		L1011
	L1329		Jetstar
Learjet	Learjet-20 series	(D)	Learjet20/30
	-30 series		
	Learjet-45 series		Learjet45
	Learjet-55 series		Learjet55
	Learjet-60 series		Learjet60
Leteckee	L410 UVP		LetL410
MBB	HFB 320		HFB320
	VFW 614		VFW-614
1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
PT Industry	IPTN CN 235-1100		IPTNCN235
Rockwell International	NA-265 series		NA265
Saab	SAAB SF340 series		SAAB340
	SAAB 2000		SAAB2000
Short Brothers	SD3 -30	(D)	SD3-30/60
	-60		
	SC5 Belfast		Belfast
Vickers- Armstrong	Vanguard		Vanguard
	Viscount		Viscount

7.4 SINGLE-PILOT AEROPLANES

7.4.1 Multi-engine turboprop aeroplane (land) : single-pilot (SP) (A)

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
Asta GAF	Nomad-22b -24A		AstaMET
Beech	90 Series 99 series 100 series 200 series 300 series	(D)	BE90/99/100/200
	1900 series	(D)	BE300/1900
Cessna/Reims Aviation	F406 425		C406/425
	441		C441
De Havilland - Canada	DHC6 series		DHC6
Dornier	DO 128-6		D128
	DO 228 Series		D228
Embraer	Bandeirante EMB 110		EMB 110
Grumman	Tracker S2FT		S2FT
Mitsubishi	MU 2B series		MU 2B
Piaggio	P166		Piaggio 166
	P180		Piaggio 180
Pilatus Britten	BN2T Turbine Islander	(D)	BN2T
	BN2T - 4R MSSA BN2T - 4S Defender		
Piper	PA31 series Cheyenne I/II	(D)	PA31/42
	PA42 series Cheyenne III		
Rockwell	AC 680t -690 series -900 series		Rockwell MET
Short	SC7 Skyvan		SC7 Skyvan
Swearingen / Fairchild	SA 226 AT SA 226 TC SA 227 series		SA 226AT/TC/227
	SA 26 AT SA 226 T SA 226 T(B)		SA26AT/226T

7.4.2 SINGLE ENGINE - SINGLE-PILOT

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
Pilatus	PC-7 MkII PC-9 PC-9 (M)		PC9/PC7MkII
	PC-12 series		PC 12
Piper	PA-46 Malibu	(D)	PA46
	PA-46 Malibu Turbine		
Walter Extra	Extra 400		Extra 400

7.4.3 MULTI-ENGINE TURBO-PROP (SEA) - SINGLE-PILOT

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
Canadair	CL215T		CL215T

7.5 Multi-engine turbo-jet (land) - Single-pilot (SP)

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
Aerospatiale	MS760 Paris	S760	
Cessna	C501/500P*	(D)	C501/551
	C551/550sp*		
	C525		C525

8. FUTURE CASES

8.1 The aircraft manufacturer plays the key role in formulating the aircraft groupings and the requirements of training. The aircraft manufacturer's recommendations will be the primary source of deciding the inclusion of future aircraft groupings and the additional training requirements.

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