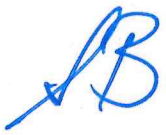
CAAT
สำนักงานการบินพลเรือนแห่งประเทศไทย
The Civil Aviation Authority of Thailand

AIR OPERATOR CERTIFICATE REQUIREMENTS (AOCR)



Sarun Benjanirat
Deputy Director General
acting Director General
The Civil Aviation Authority of Thailand

Issue 02
Revision 02
Effective Date: 04 Dec 2023

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RECORD OF REVISIONS

Issue No.	Revision No.	Action	Date	Subject	Inserted by
Original	Initial Issue	ADD	8 JUL 15		DCA
1	1	ADD	8 SEP 16		CAAT
1	2	ADD	9 NOV 16	Chapter 8 paragraph 2.2, 2.3,2.4.	CAAT (AIR)
1	2	ADD	9 NOV 16	Chapter 8 paragraph 8.3.4.	CAAT (AIR)
1	2	ADD	9 NOV 16	Appendix W.	CAAT (AIR)
1	3	ADD	31 MAR 17	Chapter 2 paragraph 4, 21.1, 28,30A,35, 40.	CAAT (OPS)
1	3	ADD	31 MAR 17	Chapter 6 paragraph 1.4 1.7, and 6.	CAAT (OPS)
1	3	ADD	31 MAR 17	Chapter 7 paragraph 3.2.	CAAT (OPS)
1	3	ADD	31 MAR 17	Chapter 8 paragraph 8.18.4.6, and 8.2.5.3.	CAAT (OPS)
1	3	ADD	31 MAR 17	Chapter 9 paragraph 2.1A, 2.9, 6.2, 10.7, 10.8, 11, 12, and 13.	CAAT (OPS)
1	3	ADD	31 MAR 17	Appendix A, and Application and Associated Forms.	CAAT (OPS)
1	3	ADD	31 MAR 17	Appendix J.	CAAT (OPS)
1	3	ADD	31 MAR 17	Appendix T Item 2.	CAAT (OPS)
1	4	ADD	2 MAY 17	Items in Chapter 0, Definition.	CAAT (OPS)
1	4	ADD	2 MAY 17	Chapter 1, paragraph 9A.	CAAT (OPS)
1	4	ADD	2 MAY 17	Chapter 2, paragraph 6.7, 7, 13.12, 28.1, 35.1.4, 35.1.5, 35.1.6, 35.1.7, 35.1.8.	CAAT (OPS)
1	4	ADD	2 MAY 17	Chapter 5, paragraph 11.	CAAT (OPS)
1	4	ADD	2 MAY 17	Chapter 5, Item 3.1.9, 3.1.10, 3.2.4(l), 4.11.	CAAT (OPS)
1	4	ADD	2 MAY 17	Appendix N	CAAT (OPS)
1	4.01	REV	8 JUN 17	Chapter 2, paragraph 35.	CAAT (OPS)
1	4.01	REV	8 JUN 17	Chapter 6, paragraph 9.	CAAT (OPS)
1	4.01	REV	8 JUN 17	Appendix A, and AOC Application and Associated Forms.	CAAT (OPS)
1	4.01	REV	8 JUN 17	Appendix C.	CAAT (OPS)
1	5	ADD	18 SEP 17	Items in Chapter 0, Definition.	CAAT (OPS)
1	5	ADD	18 SEP 17	Chapter 1, paragraph 5.1, and 5.3	CAAT (OPS)
1	5	ADD	18 SEP 17	Chapter 2, paragraph 26A.1, and 26A.3.	CAAT (OPS)
1	5	REV	18 SEP 17	Chapter 2, paragraph 35.1.3, 35.1.4, and 35.3.	CAAT (OPS)

Issue No.	Revision No.	Action	Date	Subject	Inserted by
1	5	ADD	18 SEP 17	Chapter 3, paragraph 3.2, and 3.6	CAAT (OPS)
1	5	ADD	18 SEP 17	Chapter 4, paragraph 1.10.2(a), and 2.6.13	CAAT (OPS)
1	5	ADD	18 SEP 17	Chapter 5, paragraph 9.1, and 10.5.2	CAAT (OPS)
1	5	ADD	18 SEP 17	Chapter 6, paragraph 1.1.1, 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.3.1, 1.4.4, 1.4.9, 1.5.2, 1.6.3, 1.7, 1.8.1, 1.8.2, 2.4, 3.5, 3.7.1, 4.2.1, 4.3.1, 4.4.1, 4.10.1, 4.11.3, 4.14.2, 4.17.1, 5, 5.1.1, 5.2.1, 6, 6.1.1, 9, 10, 10.1.1, 10.2.2, 11, and 12.	CAAT (OPS)
1	5	ADD	18 SEP 17	Chapter 7, 1.3.1, 1.3.2, 1.3.3, 1.3.3A, 1.4.1, 1.4.3, 1.5, 1.8, 2.4.1, 3.1.9, 3.1.10, 3.2.4, 4.1, 4.2, 4.3, 4.11, 6.1.1, and 6.1.2.	CAAT (OPS)
1	5	DEL	18 SEP 17	Chapter 7, repealed paragraph 1.3.3B, 5.3, 5.4	CAAT (OPS)
1	5	ADD	18 SEP 17	Chapter 9, paragraph 12.1.2, and 14.	CAAT (OPS)
1	5	REV	18 SEP 17	Appendix A, new revision of AOC Application form, and added new details in Application for Operations Specification [Form: OPS Form-101]. 11)	CAAT (OPS)
1	5	ADD	18 SEP 17	Appendix C, paragraph 2.4, and 6.3	CAAT (OPS)
1	5	DEL	18 SEP 17	Appendix C, repealed definition item (25).	CAAT (OPS)
1	5	ADD	18 SEP 17	Appendix L, paragraph 2.3.1, 6 and 7.	CAAT (OPS)
1	5	ADD	18 SEP 17	Appendix Q, item 3.3.	CAAT (OPS)
1	6	ADD	1 FEB 19	Items in Chapter 0, Definition..	CAAT (OPS)
1	6	ADD	1 FEB 19	Chapter 1, paragraph 1.2, 5.2, 6.3, 7.2, 7.7, 10.4, and 10.9.	CAAT (OPS)
1	6	ADD	1 FEB 19	Chapter, paragraph 8.8, 17.4, 21.1, 30A.1, 30A.4, and 38.3.	CAAT (OPS)
1	6	ADD	1 FEB 19	Chapter 2, paragraph 19B and 23.	CAAT (OPS)
1	6	REV	1 FEB 19	Chapter 2, paragraph 21.4, and 21.6.	CAAT (OPS)
1	6	ADD	1 FEB 19	Chapter 3, paragraph 3.4, 3.9, and 3.11.	CAAT (OPS)
1	6	REV	1 FEB 19	Chapter 3, paragraph 4.1.	CAAT (OPS)
1	6	ADD	1 FEB 19	Chapter 5, paragraph 14.	CAAT (OPS)
1	6	REV	1 FEB 19	Chapter 6.	CAAT (OPS)
1	6	REV	1 FEB 19	Chapter 7.	CAAT (OPS)
1	6	ADD	1 FEB 19	Chapter 8, paragraph 2.2, 2.3, 2.4, 2.7, 4.1, 4.5, 7.1.6, 7.3.1, 8.3.1, 8.3.4, 8.3.5, 8.5, 8.6, 8.7, and 8.8	CAAT (OPS)
1	6	DEL	1 FEB 19	Chapter 9 repealed paragraph 1.2	CAAT (OPS)
1	6	REV	1 FEB 19	Appendix A, AOC Application and Associated Forms.	CAAT (OPS)

Issue No.	Revision No.	Action	Date	Subject	Inserted by
1	6	REV	1 FEB 19	Appendix C.	CAAT (OPS)
1	6	REV	1 FEB 19	Appendix J.	CAAT (OPS)
1	6	ADD	1 FEB 19	Appendix K2.	CAAT (OPS)
1	6	ADD	1 FEB 19	Appendix Q.	CAAT (OPS)
1	6	DEL	1 FEB 19	Appendix S - Repealed Definitions for Additional Requirements for Helicopter Operations.	CAAT (OPS)
1	6	ADD	1 FEB 19	Appendix W.	CAAT (OPS)
1	6	ADD	1 FEB 19	Appendix X.	CAAT (OPS)
1	6	ADD	1 FEB 19	Appendix Y.	CAAT (OPS)
1	6	ADD	1 FEB 19	Appendix Z1.	CAAT (OPS)
1	6	ADD	1 FEB 19	Appendix Z2.	CAAT (OPS)
1	6	ADD	1 FEB 19	Appendix AA.	CAAT (OPS)
1	6	ADD	1 FEB 19	Appendix AB	CAAT (OPS)
1	6.1	REV	30 APR 19	Chapter 2, paragraph 28., and 38.5.	CAAT (OPS)
1	6.1	REV	30 APR 19	Chapter 4, paragraph 2.6.13.	CAAT (OPS)
1	6.1	REV	30 APR 19	Appendix A, and AOC Application and Associated Forms	
2	0	ADD	30 APR 21	Chapter 0, Foreword.	CAAT (OPS)
2	0	REV	30 APR 21	Chapter 0, paragraph 11.	CAAT (OPS)
2	0	ADD	30 APR 21	Chapter 0, Definition.	CAAT (OPS)
2	0	REV	30 APR 21	Chapter 1, paragraph 1 (c), (d), (e) 1.3, 2.1(c), 3.1, 3.2, 5.1, 5.2, 7.2, 7.5, 10, 11, and 12.	CAAT (OPS)
2	0	ADD	30 APR 21	Chapter 1, paragraph 13,	CAAT (OPS)
2	0	REV	30 APR 21	Chapter 2, paragraph 1.3, 1.7, 1.8, 1.9, 1.10, 2.1, 2.2, 3, 3.1, 3.2, 3.6, 4.2, 5.2, 5.3, 5.3.7, 5.5, 6.1.1, 6.1.2, 6.1.4, 6.2.1, 6.4, 6.5, 6.6, 6.7, 6.8, 8.1, 8.9, 8.9.1, 8.9.2, 11.5, 12.1, 12.2, 12.3, 12.4, 12.5, 12.6, 12.7, 12.8, 12.9, 13.1, 13.2, 13.3, 13.4, 13.6, 13.7, 13.8, 13.9, 13.10, 13.11, 13.12, 13.13, 13.14, 13.15, 13.16, 13.17, 13.17, 13.18, 13.19, 13.20, 13.21, 13.22, 13.23, 13.24, 13.25, 13.26, 13.27, 13.28, 13.29, 13.30, 17.1, 17.4, 18.1, 18.2, 20.1, 20.2, 22.1, 22.2, 22.3, 22.4, 22.5, 22.6, 22.7, 22.8, 24, 24.1, 24.2, 24.3, 24.4, 24.5, 24.6, 24.7, 25, 26, 27,28, 29, 30, 31, 32, 33, 34, 35.1, 37.2, 37.3, 37.4, 38, 39, 40, 41, 41.1, and 41.2.	CAAT (OPS)

Issue No.	Revision No.	Action	Date	Subject	Inserted by
2	0	ADD	30 APR 21	Chapter 2, paragraph 2.6, 2.7, 5.3.8, 6.4.2, 6.4.3, 7.2.3, 16.4, 21.1, 23.3, 23.4, 23.5, 23.6, and 23.7.	CAAT (OPS)
2	0	DEL	30 APR 21	Chapter 2, paragraph 6.2.2, 6.2.3, 6.3	
2	0	REV	30 APR 21	Chapter 3, paragraph 1, 2.1.12, 3.2, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 3.11.1, 3.11.2(a), and 4.1.	CAAT (OPS)
2	0	ADD	30 APR 21	Chapter 3, paragraph 3.1, 3.11.2 (b), 3.12, 3.13, and 6.	CAAT (OPS)
2	0	REV	30 APR 21	Chapter 4, paragraph 1.4.1, 1.4.2, 1.9.1, 1.10.2(a)(b), 7.3, 9.1, 9.2, 11.8.1, 13.1, 15.2, 16, 17, 18, and 19.	CAAT (OPS)
2	0	ADD	30 APR 21	Chapter 4, paragraph 9.1, 9.2, and 9.3.	CAAT (OPS)
2	0	DEL	30 APR 21	Chapter 4, paragraph 15.3 and 20.	CAAT (OPS)
2	0	REV	30 APR 21	Chapter 5, paragraph 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 2, 2.3, 2.3.1, 2.3.2, 2.3.3, 2.3.4, 2.4, 9.1, 10.2, 10.3, 10.4, 10.5, 10.6, 10.8.1, 11.1.1(b)(c), 11.5, 11.6,13.1, 14.1, and 14.3.	CAAT (OPS)
2	0	ADD	30 APR 21	Chapter 5, paragraph 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 2.1, 2.2, 3.3, 3.4, 11.4, 14.2, 14.5, 14.6, 14.7, 14.8, 14.9, 15, 16, 17, 18, and 19.	CAAT (OPS)
2	0	REV	30 APR 21	Chapter 6, paragraph 1.4.3, 1.6.1, 1.7(a)(d), 2.4.1, 2.5.2, 2.7.1, 3.2.1, 3.7.1, 3.9, 3.10, 4.3.1, 4.7.1, 4.9.1, 4.10.1, 7.4.1, 7.5.1, 8.1.1, and 9(g).	CAAT (OPS)
		ADD	30 APR 21	Chapter 6 paragraph 3.11, 4.18, 4.19, 5.2, and 7.6	CAAT (OPS)
2	0	REV	30 APR 21	Chapter 7, paragraph 1.6.1, 1.8.1, 3.1.10, 3.2.2, 3.2.3, 4.7.1, and 5.1.3.	CAAT (OPS)
2	0	ADD	30 APR 21	Chapter 7 paragraph 1.9, and 5.1.4.	CAAT (OPS)
2	0	REV	30 APR 21	Chapter 8, paragraph 1.1, 2.1A, 2.1B.2, 2.1B.3, 2.1B.4, 2.6.1(d), 2.7.1, 4.3.3, 4.4.3, 5.5.4, 11.1.1, 12.1.1, 12.1.2, 12.1.3, 12.3.1, 13.1	CAAT (OPS)
2	0	ADD	30 APR 21	Chapter 8, paragraph 2.1a.2, 2.1a.3, 2.9.1	CAAT (OPS)
2	0	REV	30 APR 21	Relocation from Chapter 8 to Chapter 9	CAAT (AIR)
2	0	ADD	30 APR 21	Chapter 10, Aeroplane instruments, equipment and flight documents.	CAAT (AIR)
2	0	ADD	30 APR 21	Chapter 11, Aeroplane communication, navigations, surveillance equipment.	CAAT (AIR)
2	0	ADD	30 APR 21	Chapter 12, Aeroplane continuing airworthiness	CAAT (AIR)
2	0	ADD	30 APR 21	Chapter 13, Manuals, logs and records	CAAT (AIR)
2	0	REV	30 APR 21	Appendix A	CAAT (OPS)
2	0	REV	30 APR 21	Relocation from Appendix K2 to Appendix B	CAAT (OPS)
2	0	REV	30 APR 21	Relocation from Appendix L to Appendix D	CAAT (OPS)
2	0	REV	30 APR 21	Relocation from Appendix X to Appendix E	CAAT (OPS)

Issue No.	Revision No.	Action	Date	Subject	Inserted by
2	0	REV	30 APR 21	Relocation from Appendix Y to Appendix F	CAAT (OPS)
2	0	REV	30 APR 21	Combined Appendix Z1 and Z2 to Appendix G	CAAT (OPS)
2	0	REV	30 APR 21	Appendix H revised to new AOCR format	CAAT (OPS)
2	0	REV	30 APR 21	Relocation from Appendix AA to Appendix I	CAAT (AIR)
2	0	REV	30 APR 21	Relocation Appendix J, Dangerous Goods Training to Chapter 4, paragraph 16.	CAAT (OPS)
2	0	ADD	30 APR 21	Appendix J, Minimum Equipment List (MEL)	CAAT (AIR)
2	0	REV	30 APR 21	Relocation from Appendix K1 to Appendix K, Flight Safety Document System	CAAT (OPS)
2	0	DEL	30 APR 21	Appendix K1	CAAT (OPS)
2	0	DEL	30 APR 21	Appendix K2	CAAT (OPS)
2	0	REV	30 APR 21	Relocation from Appendix U to Appendix L	CAAT (OPS)
2	0	REV	30 APR 21	Appendix O, paragraph 1, 2, 3, 4, 5, 6, 7	CAAT (OPS)
2	0	ADD	30 APR 21	Appendix O, paragraph 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 5.10, 5.11, 5.12, 8, 9, 10	CAAT (OPS)
2	0	REV	30 APR 21	Relocation from Appendix G to Appendix P	CAAT (AIR)
2	0	ADD	30 APR 21	Appendix Q, Quality Management System	CAAT (OPS)
2	0	REV	30 APR 21	Relocation Appendix R, Reduced Vertical Separation Minimum (RVSM) to Chapter 2, paragraph 24.4	CAAT (OPS)
2	0	ADD	30 APR 21	Appendix R, Location of an Aeroplane in Distress	CAAT (AIR)
2	0	REV	30 APR 21	Relocation Appendix S, Safety Management System to Chapter 5, paragraph 10.2	CAAT (OPS)
2	0	ADD	30 APR 21	Appendix S, Medical Supplies	CAAT (AIR)
2	0	REV	30 APR 21	Appendix T revised to new AOCR format	CAAT (OPS)
2	0	ADD	30 APR 21	Appendix U, Lights to Be Displayed by Aeroplanes	CAAT (AIR)
2	0	ADD	30 APR 21	Appendix V, Flight Recorder	CAAT (AIR)
2	0	REV	30 APR 21	Appendix W revised to new AOCR format	CAAT (AIR)
2	0	ADD	30 APR 21	Appendix X, Guide to Current Flight Recorder Provisions	CAAT (AIR)
2	1	REV	01 AUG 23	Introduction, paragraph 11	CAAT (OPS)
2	1	ADD	01 AUG 23	Definition, shall and should	CAAT (OPS)
2	1	REV	01 AUG 23	Chapter 1, paragraph 1.2(b), 1.2(d), 5.1, 5.1 (h), 7.2 (e), 13.1.1, 13.1.4, 13.1.5, 13.1.6, 13.1.7, 13.1.8, 13.2.2, 13.2.3, 13.2.4, 13.2.5, 13.2.6	CAAT (OPS)

Issue No.	Revision No.	Action	Date	Subject	Inserted by
2	1	ADD	01 AUG 23	Chapter 1, paragraph 6.6	CAAT (OPS)
2	1	REV	01 AUG 23	Chapter 2, paragraph 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13, 1.14, 1.15, 1.16, 1.17, 1.18, 6.1.1, 6.5.1, 6.6.3, 6.6.6, 22.5, 33.1, 33.2, 33.3, 33.4	CAAT (OPS)
2	1	DEL	01 AUG 23	Chapter 2, paragraph 33.5	CAAT (OPS)
2	1	ADD	01 AUG 23	Chapter 4, paragraph 20.1	CAAT (OPS)
2	1	REV	01 AUG 23	Chapter 5, paragraph 14.2, 14.4, 14.6.3, 14.8.2	CAAT (OPS)
2	1	ADD	01 AUG 23	Chapter 6, paragraph 13.1	CAAT (OPS)
2	1	REV	01 AUG 23	Chapter 9	CAAT (AIR)
2	1	ADD	01 AUG 23	Chapter 10, paragraph 18.1, 18.3, 18.4	CAAT (OPS)
2	1	ADD	01 AUG 23	Chapter 12, Page 12-1	CAAT (OPS)
2	1	ADD	01 AUG 23	Chapter 13, Page 13-1, 13-2	CAAT (OPS)
2	1	ADD	01 AUG 23	Appendix A, paragraph 1	CAAT (OPS)
2	1	REV	01 AUG 23	Appendix A, paragraph 2	CAAT (OPS)
2	1	DEL	01 AUG 23	Appendix A, paragraph 4, 5, 6, 7, 8	CAAT (OPS)
2	1	REV	01 AUG 23	Appendix C	CAAT (OPS)
2	1	REV	01 AUG 23	Appendix D, paragraph 8, item 11	CAAT (OPS)
2	1	REV	01 AUG 23	Appendix I	CAAT (AIR)
2	1	ADD	01 AUG 23	Appendix Y	CAAT (AIR)
2	1	ADD	01 AUG 23	Appendix Z	CAAT (AIR)
2	1	ADD	01 AUG 23	Appendix AA	CAAT (AIR)
2	1	ADD	01 AUG 23	Appendix AB	CAAT (AIR)
2	1	ADD	01 AUG 23	Appendix AC	CAAT (AIR)
2	1	ADD	01 AUG 23	Appendix AD	CAAT (AIR)
2	1	ADD	01 AUG 23	Appendix AE	CAAT (AIR)
2	1	ADD	01 AUG 23	Appendix AF	CAAT (AIR)
2	1	ADD	01 AUG 23	Appendix AG	CAAT (AIR)
2	2	REV	04 DEC 23	Appendix C	CAAT (OPS)

RECORD OF AMENDMENTS ANNEX 6

No.	Date Applicable	Date Entered in AOCR	Entered By
35	15 DEC 11	8 JUL 16	OPS
36	15 NOV 12	8 SEP 16	OPS
37-A	14 NOV 13	8 SEP 16	OPS
37-B	13 NOV 14	8 SEP 16	OPS
38	13 NOV 14	8 SEP 16	OPS
39	8 NOV 18	31 MAR 17	OPS
40-A	10 NOV 16	8 JUN 17	OPS
40-B	7 NOV 19	1 FEB 19	OPS
40-C	5 NOV 20	1 FEB 19	OPS
41	27 APR 17	1 FEB 19	OPS
42	8 NOV 18	1 FEB 19	OPS
43	8 NOV 18	1 FEB 19	OPS
44	5 NOV 20	1 OCT 19	OPS
45	4 NOV 21	1 OCT 19	OPS
46	25 MAR 21	1 OCT 19	OPS
47	03 NOV 22	1 AUG 23	OPS
48	29 DEC 22	1 AUG 23	OPS

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LIST OF EFFECTIVE PAGES

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ROR - 1	2	1	01 Aug 23
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DEF - 1	2	0	30 Apr 21
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Chapter 1 Application for Air Operator Certificate			
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3-14	2	0	30 Apr 21
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4-1	2	0	30 Apr 21
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FOREWORD

The Civil Aviation Authority of Thailand (CAAT) is responsible under section 37 of the Civil Aviation Emergency Decree B.E.2558 for issuing regulations, requirements, notifications, rules and orders to stipulate qualifications, rules, procedures, conditions, standards and practical guidance for the following matters to ensure conformity with current and timely International Standards.

The Air Operator Certificate Requirements (hereinafter "AOCR") is the means CAAT uses to meet its responsibilities under the Civil Aviation Emergency Decree B.E.2558 for promulgating aviation safety standards. The AOCR prescribes the detailed technical material (aviation safety standards) that is determined to be necessary for the safety of flight operations.

The AOCR is referenced in the particular regulation. You should refer to the applicable provisions of the Civil Aviation Emergency Decree B.E.2558 and CAAT regulation and Requirements together with this AOCR, to ascertain the requirements of, and the obligations imposed by or under the civil aviation legislation.

Readers should forward advice of error, inconsistencies or suggestions for improvement to this manual to the Manager, Flight Operations Standards Department (please see in the Introduction)

The AOCR is issued and amended under the authority of the Director General of the Civil Aviation Authority of Thailand.

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Director General

The Civil Aviation Authority of Thailand

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INTRODUCTION AND APPLICABILITY

1. Pursuant to RCAB 86 of the Thai Civil Aviation Board Regulation para. 3 (3.9) and the Authority Announcements as appropriate, Air Operator Certificate (AOC) holder shall act in accordance with any requirements issued by The Civil Aviation Authority of Thailand.
2. This Air Operator Certificate Requirements (AOCR) states the necessary conditions, qualities, qualifications, standards and procedures necessary to qualify for and maintain an AOC, as well as to incorporate new practices or procedures to ensure the safety of the travelling public.
3. The Civil Aviation Authority of Thailand will hereafter be referred to as the Authority in the AOCR. The 'Competent Official' means the Director General of the Civil Aviation Authority of Thailand. This will include any person authorised by him to act on his behalf and any person acting in that capacity.
4. Authorised Officers are 'authorised persons' for the purpose of the AOCR. These officers are authorised to examine documents, inspect premises and equipment and to board aircraft in the course of discharging their duties.
5. Supplementary requirements or advisory materials will be notified in the form of Notices to Airmen (NOTAM), Aeronautical Information Circulars (AIC), Guidance Material (GM), Aeronautical Information Publications (AIP), Airworthiness Notices (AN), the Authority Announcements, and Manual of Standards - Units of Measurement to be used for Air and Ground Operations or any other official publication so issued by the Authority.
6. Operator certification and the associated requirements apply to a very wide range of activity, from short air taxi and pleasure flights to world-wide airline operations. In the statutory provisions few distinctions are drawn between small scale operations with light aircraft and major airline undertakings, for the basic principles of sound operating practice are essentially similar at all levels. Nevertheless, in the application of these principles and of certification requirements, it is possible and it is necessary to take account of the scale and scope of an operator's flying activity and particular circumstances. Operators may rest assured that the Authority and its inspecting staff are fully conscious of this and in dealing with certification matters will always endeavour to adopt as flexible an approach as is consistent with the maintenance of adequate standards. Small scale operators of light aircraft should bear this particularly in mind when reading this publication.
7. In this publication the word 'must/shall' is used to indicate where the Director General expects the Operator to respond and adhere closely to the defined requirement. The word 'should' is used to indicate that the Operator has a degree of latitude, particularly where the nature of the operation affects the degree of compliance, but may not ignore the requirement. If the Operator's response is deemed to be inadequate by the Director General, a specific requirement may be applied as a condition of the AOC.

8. The status of Air Operator Certificate Requirements (AOCR)

   It is the policy of the Director General to exercise his various discretionary powers by reference to certain documents with a view to ensuring effective implementation of International Civil Aviation Organisation (ICAO) standards. In order to ensure that all these ICAO standards are reflected in Thailand, this AOCR is published. In the event there is any conflict in the contents of this AOCR with the legal requirements or the Authority Announcements, the air operator should refer to the legal requirements or contact the Authority for clarification.

   The issue of a Certificate signifies only that the holder is considered 'competent to secure the safe operation' of the Operator's aircraft. It does not in any way relieve an operator or an aircraft commander of the responsibility for compliance with statutory requirements and for the safe conduct of a particular flight. International agreements and Thailand legislation are generally based on the concept that the ultimate responsibility for the safety of flight operations rests with the Operator and the commander. The issue of a Certificate and the work of the Authority in that connection does not entail any departure from this general principle. This is in accordance with the principle of "operator's responsibility" and helps to facilitate the development of the operating standards and techniques best suited to particular circumstances and conditions. The competence of an operator to 'secure the safe operation' of aircraft will therefore depend, in part, upon the manner in which he applies the statutory requirements to the particular operation. It is important, nevertheless, to appreciate that in the last resort the interpretation of the statutes is a function of the judiciary and that neither the issue of a Certificate nor the expression of any view in this publication should be taken as an indication to the contrary or as a modification of any statutory requirements.

9. Inspectors

   Reference is made in the publication to Inspector including Aviation Safety Inspectors (ASI), Cabin Safety Inspectors, Airworthiness Inspectors and Dangerous Goods Inspectors. Inspectors are authorised in accordance with the relevant statutory provisions and the conditions of Air Operators' Certificates to examine documents, premises and equipment, to enter and remain on the flight deck of an aircraft in flight (for Aviation Safety Inspectors) and, if necessary, to issue directions to prevent aircraft flying.

   The primary duty of the Inspectors is to ascertain facts and to report them; this duty must be fully discharged. However, it is their aim to work in close collaboration with operators and their staff to secure through regular discussion and exchange of views the highest possible standard of operational safety. It is expected that a relationship of mutual respect between Inspectors and the operator's officials, aircraft commanders and other aircraft crew members with whom they come into contact can be developed and maintained.

10 Differences between ICAO Standards and those in AOCR

Notwithstanding the above, where there is a difference between a standard prescribed in ICAO documents and the Air Operator Certificate Requirements (AOCR), the AOCR standard shall prevail.

11 AOCR Documentation Change Management

The Flight Operations Standards Department (OPS) has responsibility for the technical content of this AOCR. Suggested changes to this AOCR may be provided to the Manager, Flight Operations Standards Department of CAAT by:

Email:	ops_ct@caat.or.th
Telephone:	+66(0) 2568 8843
Mail:	The Civil Aviation Authority of Thailand, 333/105 Lak Si Plaza, Khamphaeng Phet 6 Rd., Talat Bang Khen, Lak Si, Bangkok, Thailand 10210

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DEFINITIONS

In this Requirement, unless the context otherwise requires –

A

Accelerate-Stop Distance Available (ASDA) means the length of the take-off run available plus the length of Stopway, if provided.

Acts of Unlawful Interference means acts or attempted acts such as to jeopardise the safety of civil aviation and air transport, i.e.

(a) Unlawful seizure of aircraft in flight;

(b) Unlawful seizure of aircraft on the ground;

(c) Hostage-taking on board an aircraft or on aerodromes;

(d) Forcible intrusion on board an aircraft, at an airport or on the premises of an aeronautical facility;

(e) Introduction on board an aircraft or at an airport of a weapon or hazardous device or material intended for criminal purposes; and

(f) Communication of false information as to jeopardise the safety of an aircraft in flight or on the ground, of passengers, crew, ground personnel or the general public, at an airport or on the premises of a civil aviation facility.

Aerodrome means a defined area on land (including any building, installation and equipment) used or intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

Aerodrome Operating Minima in relation to the operation of an aircraft at an aerodrome, means the limits of usability of an aerodrome for:

(a) Take-off, expressed in terms of runway visual range or visibility, or both, and cloud conditions where necessary;

(b) Landing in 2D instrument approach operations, expressed in terms of visibility or runway visual range, or both, minimum descent altitude/height (MDA/h) and, if necessary, cloud conditions; and

(c) Landing in 3D instrument approach operations, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H) as appropriate to the type or category of operations, or both.

Aerial work means an aircraft operation in which an aircraft is used for specialized services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, aerial advertisement, etc.

Agreement means a formal agreement, between an operator and an external services provider, that identify the document of measurable specifications that can be monitored by the operator to ensure requirements that affect the quality, safety and security are being fulfilled by the service provider or contracted organization or outsourcing.

Alternate Aerodrome means an aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to, or to land at, the aerodrome of intended landing and which meets all of the following requirements:

(a) The necessary services and facilities are available;

(b) The aircraft performance requirements can be met;

(c) The aerodrome is operational at the expected time of use. Alternate aerodromes include the following:

Take-off Alternate means an alternate aerodrome at which an aircraft would be able to land should this become necessary shortly after take-off and it is not possible to use the aerodrome of departure.

En-Route Alternate means an alternate aerodrome at which an aircraft would be able to land in the event that a diversion becomes necessary while en-route.

Destination Alternate means an alternate aerodrome at which an aircraft would be able to land should it become either impossible or inadvisable to land at the aerodrome of intended landing.

Note:- *The aerodrome from which a flight departs may also be an en route or a destination alternate aerodrome for that flight.*

Altimetry System Error (ASE) means the difference between the altitude indicated by the altimeter display, assuming a correct altimeter barometric setting, and the pressure altitude corresponding to the undisturbed ambient pressure

Aeroplane means a power-driven heavier-than-air aircraft, deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.

Aircraft means any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

Aircraft Operating Manual means a manual, acceptable to the State of the Operator, containing normal, abnormal and emergency procedures, checklists, limitations, performance information, details of the aircraft systems and other material relevant to the operation of the aircraft.

Note:- *The aircraft operating manual is part of the operations manual.*

Aircraft Tracking means a process, established by the operator, that maintains and updates, at standardized intervals, a ground based record of the four-dimensional position of individual aircraft in flight.

Air Operator Certificate (AOC) means a certificate authorizing an operator to carry out specified commercial air transport operations.

Air Traffic Services (ATS) means a generic term meaning variously, flight information service, altering service, air traffic advisory service, air traffic control service (area control service, approach control services or aerodrome control service).

Airworthy means the status of an aircraft, engine, propeller or part when it conforms to its approved design and is in a condition for safe operation.

Area Navigation (RNAV). A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

Note:- *Area navigation includes performance-based navigation as well as other operations that do not meet the definition of performance-based navigation.*

Approval means an authorisation granted by the Authority for:

(a) The transport of dangerous goods forbidden on passenger and/or cargo aircraft where the Technical Instructions state that such goods may be carried with an approval; or

(b) Other purposes as provided for in the Technical Instructions.

Note:- *In the absence for a specific reference in the Technical Instructions allowing the granting of an approval, an exemption may be sought.*

Appropriate Airworthiness Requirements means the comprehensive and detailed airworthiness code established, adopted or accepted by the CAAT for the class of aircraft, engine or propeller under consideration.

Authority means The Civil Aviation Authority of Thailand (CAAT).

C

Cabin Crew Member means a crew member who performs, in the interest of safety of passengers, duties assigned by the operator or the Pilot-in-Command of the aircraft, but does not include a flight crew member.

Cargo Aircraft means any aircraft, other than a passenger aircraft, which is carrying goods or property.

Crew Member means a person assigned by an operator to duty on an aircraft during a flight duty period.

COMAT means operator material carried on an operator's aircraft for the operator's own purposes.

Combined Vision System (CVS) means a system to display images from a combination of an Enhanced Vision System (EVS) and a Synthetic Vision System (SVS).

Commercial Air Transport Operation means an aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire. This could also be interpreted as 'public transport' in this document.

Contract see definition in Agreement.

Contracted Organization see definition in Service Provider.

Configuration Deviation List (**CDL**) means a list established by the organization responsible for the type design with the approval of the State of Design which identifies any external parts of an aircraft type which may be missing at the commencement of a flight, and which contains, where necessary, any information on associated operating limitations and performance correction.

Congested Area in relation to a city, town or settlement, means any area which is substantially used for residential, commercial or recreational purposes.

Contaminated Runway means a runway is contaminated when a significant portion of the runway surface area (whether in isolated areas or not) within the length and width being used is covered by one or more of the substances listed in the runway surface condition descriptors.

Note:- *Further information on runway surface condition descriptors can be found in the Annex 14, Volume I: Definitions*

Continuing Airworthiness means the set of processes by which all aircraft comply with the applicable airworthiness requirements and remain in a condition for safe operation throughout their operating life.

Continuing Airworthiness Records means records which are related to continuing airworthiness status of an aircraft, engine, propeller or associated part.

Continuous Descent Final Approach (CDFA) means a technique, consistent with stabilized approach procedures, for flying the Final Approach Segment (FAS) of an instrument Non-Precision Approach (NPA) procedure as a continuous descent, without level-off, from an altitude/height at or above the final approach fix altitude/height to a point approximately 15 m (50 ft) above the landing runway threshold or the point where the flare manoeuvre begin for the type of aircraft flown; for the FAS of an NPA procedure followed by a circling approach, the CDFA technique applies until circling approach minima (circling OCA/H) or visual flight manoeuvre altitude/height are reached.

Critical Engine Any engine whose failure gives the most adverse effect on the aircraft characteristics relative to the case under consideration.

Note:- *On some aircraft there may be more than one equally critical engine. In this case, the expression "the critical engine" means one of those critical engines.*

Cruise Relief Pilot means a flight crew member who is assigned to perform pilot tasks during cruise flight, to allow the pilot-in-command or a co-pilot to obtain planned rest.

Cruising Level means a level maintained during a significant portion of a flight.

D

Dangerous Goods means articles or substances which are capable of posing a hazard to health, safety, property or the environment and which are shown in the list of dangerous goods in the Technical Instructions or which are classified according to those Instructions.

Dangerous Goods Accident means an occurrence associated with and related to the transport of dangerous goods by air which results in fatal or serious injury to a person or major property or environmental damage.

Dangerous Goods Incident means an occurrence, other than a dangerous goods accident, associated with and related to the transport of dangerous goods by air, not necessarily occurring on board an aircraft, which results in injury to a person, property or environmental damage, fire, breakage, spillage, leakage of fluid or radiation or other evidence that the integrity of the packaging has not been maintained. Any occurrence relating to the transport of dangerous goods which seriously jeopardizes the aircraft or its occupants is also deemed to constitute a dangerous goods incident.

Decision Altitude (**DA**), or **Decision Height** (**DH**), in relation to the operation of an aircraft at an aerodrome, means a specified altitude or height in a 3D instrument approach operation at which the pilot-in-command must initiate a missed approach if the visual reference to continue the approach has not been established.

Note 1:- *Decision Altitude (DA) is referenced to mean sea level and Decision Height (DH) is referenced to the threshold elevation.*

Note 2:- *The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In Category III operations with a decision height the required visual reference is that specified for the particular procedure and operation.*

Note. 3:- *For convenience where both expressions are used they may be written in the form "Decision Altitude/Height" and abbreviated "DA/H".*

Dry Runway means a runway is considered dry if its surface is free of visible moisture and not contaminated within the area intended to be used.

Duty means any task that flight or cabin crew members are required by the operator to perform, including, for example, flight duty, administrative work, training, positioning and standby when it is likely to induce fatigue.

Duty Period means a period which starts when a flight or cabin crew member is required by an operator to report for or to commence a duty and ends when that person is free from all duties.

E

Electronic Flight Bag (EFB) means an electronic information system, comprised of equipment and applications, for flight crew which allows for storing, updating, displaying and processing of EFB functions to support flight operations or duties.

Emergency Locator Transmitter (ELT) means a generic term describing equipment which broadcasts distinctive signals on designated frequencies and, depending on application, may be automatically activated by impact or be manually activated. An ELT may be any of the following;

(a) Automatic fixed ELT (ELT(AF)). An automatically activated ELT which is permanently attached to an aircraft.

(b) Automatic portable ELT (ELT(AP)). An automatically activated ELT which is rigidly attached to an aircraft but readily removable from the aircraft.

(c) Automatic deployable ELT (ELT(AD)). An ELT which is rigidly attached to an aircraft and which is automatically deployed and activated by impact, and, in some cases, also by hydrostatic sensors. Manual deployment is also provided.

(d) Survival ELT (ELT(S)). An ELT which is removable from an aircraft, stowed so as to facilitate its ready use in an emergency, and manually activated by survivors.

Enhanced Vision System (**EVS**) A system to display electronic real-time images of the external scene achieved through the use of image sensors.

Note:- *EVS does not include Night Version Imaging System (NVIS).*

Engine means a unit used or intended to be used for aircraft propulsion. It consists of at least those components and equipment necessary for functioning and control, but excludes the propeller/rotors (if applicable).

En Route Phase means that part of the flight from the end of the take-off and initial climb phase to the commencement of the approach and landing phase.

Note: - *Where adequate obstacle clearance cannot be guaranteed visually, flights must be planned to ensure that obstacles can be cleared by an appropriate margin. In the event of failure of the critical power-unit, operators may need to adopt alternative procedures.*

Evaluator means a person authorized to conduct the formal and final summative assessment of a trainee's performance.

Exception means a provision which excludes a specific item of dangerous goods from the requirements normally applicable to that item.

Exemption means an authorisation granted by the Authority providing relief from the provisions of Technical Instructions.

Extended Diversion Time Operations (EDTO) means any operation by an aeroplane with two or more turbine engines where the diversion time to an en-route alternate aerodrome is greater than the threshold time established by the Authority.

EDTO Critical Fuel means the fuel quantity necessary to fly to an en-route alternate aerodrome considering, at the most critical point on the route, the most limiting system failure.

EDTO-Significant System means an aeroplane system whose failure or degradation could adversely affect the safety particular to an EDTO flight, or whose continued functioning is specifically important to the safe flight and landing of an aeroplane during an EDTO diversion.

F

Fatigue means a physiological state of reduced mental or physical performance capability resulting from sleep loss, extended wakefulness, circadian phase, and/or workload (mental and/or physical activities) that can impair a person's alterness and ability to perform safety related operational duties.

Fatigue Risk Management System (FRMS) means a data-driven means of continuously monitoring and managing fatigue-related safety risks, based upon scientific principles and knowledge as well as operational experience that aims to ensure relevant personnel are performing at adequate levels of alertness.

Final Approach Segment (FAS) means the segment of an instrument approach in which alignment and descent for a landing are accomplished.

Flight Crew means a crew member, including the pilot, flight engineer, flight navigator and flight radio operator who is charged with duties essential to the operation of an aircraft during a flight duty period.

Flight Crew Member means a licensed crew member charged with duties essential to the operation of an aircraft during a flight duty period.

Flight Data Analysis" means a process of analysing recorded flight data in order to improve the safety of flight operations.

Flight Dispatcher/Flight Operations Officer means a suitably qualified person designated by the operator of the aircraft to provide:

(a) briefing and/or assistance to the Pilot-in-Command in the safe conduct of the flight, including pre-flight preparation for the dispatch release; and

(b) control and supervision of flight while acting as a close link between the aircraft in flight and the ground services, and between the flight crew and the operator's ground staff.

Flight Duty Period means a period which commences when a flight or cabin crew member is required to report for duty that includes a flight or a series of flights and which finishes when the aeroplane finally comes to rest and the engines are shut down at the end of the last flight on which he/she is a crew member.

Flight Manual means a manual, associated with the certificate of airworthiness, containing limitations within which the aircraft is to be considered airworthy, and instructions and information necessary to the flight crew members for the safe operation of the aircraft.

Flight Plan means specified information provided to air traffic services units relating to an intended flight or portion of a flight of an aircraft.

Flight Recorder means any type of recorder installed in the aircraft of the purposes of complementing accident/incident investigation.

Flight Safety Documents System A set of interrelated documentation established by the operator, compiling and organizing information necessary for flight and ground operations, and comprising, as a minimum, the operations manual and the operator's maintenance control manual.

Flight Simulator means a type of apparatus that provides an accurate representation of a flight deck of a particular aircraft type to the extent that the mechanical, electrical, electronic and other aircraft systems control functions, the normal environment of flight crew members, and the performance and flight characteristics of that aircraft type are realistically simulated;

Flight Simulation Training Device means an apparatus in which flight conditions are simulated on the ground and includes a flight simulator, a flight procedures trainer and a basic instrument flight trainer.

Flight Time - Aeroplanes means the total time from the moment an aeroplane first moves for the purpose of taking off until the moment it finally comes to rest at the end of the flight.

Note:- *Flight time as here defined is synonymous with the term "block to block" time or "chock to chock" time in general usage which is measured from the time an aeroplane first moves for the purpose of taking off until it finally stops at the end of the flight.*

Flight Time - Helicopters means the total time from the moment a helicopter's rotor blades start turning until the moment the helicopter finally comes to rest at the end of the flight, and the rotor blades are stopped.

Note:- *This definition is intended only for the purpose of flight and duty time regulation.*

G

General Aviation Operation means an aircraft operation other than a commercial air transport operation or an aerial work operation.

Ground Handling means services necessary for an aircraft's arrival at, and departure from, an airport, other than air traffic services.

General Maintenance Manual means a document which describes the operator's procedure necessary to ensure that all scheduled and unscheduled maintenance is performed on the operator's aircraft on time and in a controlled and satisfactory manner.

H

Head-Up Display (HUD). A display system that presents flight information into the pilot's forward external field of view.

Heliport An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.

Note 1:- *Throughout this document, when the term "heliport" is used, it is intended that the term also applies to aerodromes primarily meant for the use of aeroplanes.*

Note 2:- *Helicopters may be operated to and from areas other than heliports.*

Human Factors Principles means principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

Human Performance means human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

I

In-Charge Cabin Crew Member means cabin crew leader who has overall responsibility for the conduct and coordination of cabin procedures applicable during normal operations, and abnormal and emergency situations for flights operated with more than one cabin crew member.

Incompatible means in relation to dangerous goods, if mixed, would be liable to cause a dangerous evaluation of heat or gas or produce a corrosive substance.

Instrument Approach Operations means an approach and landing using instruments for navigation guidance based on an instrument approach procedure, executed either by a 2D or 3D instrument approach operation.

(a) A Two-Dimensional (2D) instrument approach operation means an instrument approach operation using lateral navigation guidance only; and

(b) A Three-Dimensional (3D) instrument approach operation means an instrument approach operation using both lateral and vertical navigation guidance.

Note:- *Lateral and vertical navigation guidance refers to the guidance provided either by:*

(a) A ground-based radio navigation aid; or

(b) Computer-generated navigation data from ground-based, space-based, self-contained navigation aids or a combination of these.

Instrument Approach Procedure (IAP) means a series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from

(a) The initial approach fix; or

(b) The beginning of a defined arrival route, where applicable to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply.

Instrument approach procedures are classified as follows:

(a) Non-Precision Approach (NPA) procedure. An instrument approach procedure designed for 2D instrument approach operations Type A.

Note:- *Non-precision approach procedures may be flown using a Continuous Descent Final Approach (CDFA) technique. CDFA with advisory VNAV guidance calculated by on-board equipment (see PANS-OPS (Doc 8168), Volume I, Part I, Section 4, Chapter 1, paragraph 1.8.1) are considered 3D instrument approach operations. CDFA with manual calculation of the required rate of descent are considered 2D instrument approach operations. For more information on CDFA refer to PANS-OPS (Doc 8168), Volume I, Section 1.7 and 1.8.*

(b) Approach Procedure with Vertical Guidance (APV)". A Performance-Based Navigation (PBN) instrument approach procedure designed for 3D instrument approach operations Type A.

(c) Precision Approach (PA) procedure. An instrument approach procedure based on navigation systems (ILS, MLS, GLS and SBAS CAT I) designed for 3D instrument approach operations Type A or B

Note:- *Refer to paragraph 13.1.3 in Chapter 2 for instrument approach operation types.*

Instrument Meteorological Conditions (IMC) means meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, less than the minima specified for visual meteorological conditions.

Note:- *The specified minima for visual meteorological conditions are contained in Chapter 4 of Annex 2.*

Isolated Aerodrome means a destination aerodrome for which there is no destination alternate aerodrome suitable for a given aeroplane type.

L

Landing Distance Available (LDA) means the length of runway which is declared available and suitable for the ground run of an aeroplane landing.

Large Aeroplane means an aeroplane of a maximum certificated take-off mass of over 5,700 kg.

Low-Visibility Operations (LVO) means an approach operation in RVRs less than 550 m and/or with a DH less than 60 m (200 ft) or take-off operations in RVRs less than 400 m.

M

Maintenance means the performance of tasks on an aircraft, engine, propeller or associated part required to ensure the continuing airworthiness of an aircraft, engine, propeller or associated part including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair.

Maintenance Programme means the maintenance schedule and related procedures, such as a reliability programme, necessary for the safe operation of those aircraft to which it applies.

Maintenance Release means a document which contains a certification confirming that the maintenance work to which it relates has been completed in a satisfactory manner in accordance with appropriate airworthiness requirements.

Maintenance Schedule means a document which describes the specific scheduled maintenance tasks and their frequency of completion necessary for the safe operation of those aircraft to which it applies.

Master Minimum Equipment List (MMEL) A list established for a particular aircraft type by the organization responsible for the type design with the approval of the State of Design containing items, one or more of which is permitted to be unserviceable at the commencement of a flight. The MMEL may be associated with special operating conditions, limitations or procedures.

Maximum Diversion Time means the maximum allowable range, expressed in time, from a point on a route to an en-route alternate aerodrome.

Maximum Mass means maximum certificated take-off mass.

Minimum Equipment List (MEL). A list which provides for the operation of aircraft, subject to specified conditions, with particular equipment inoperative, prepared by an operator in conformity with, or more restrictive than, the MMEL established for the aircraft type.

Meteorological Information means a meteorological report, analysis, forecast, and any other statement relating to existing or expected meteorological conditions.

Minimum Descent Altitude (MDA) or **Minimum Descent Height (MDH)** means a specified altitude or height in a non-precision 2D instrument approach operation or circling approach operation below which the pilot-in-command must not continue the descent without the required visual reference.

Note 1:- *Minimum Descent Altitude (MDA) is referenced to mean sea level and Minimum Descent Height (MDH) is referenced to the aerodrome elevation or to the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation.*

A minimum descent height for a circling approach is referenced to the aerodrome elevation.

Note 2:- *The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In the case of a circling approach the required visual reference is the runway environment.*

Note 3:- *For convenience when both expressions are used they may be written in the form "Minimum Descent Altitude/Height" and abbreviated "MDA/H".*

N

Navigation Specification A set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications:

RNP Specification A navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH.

RNAV Specification A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1.

Note:- *The Performance-based Navigation Manual (Doc 9613), Volume II contains detailed guidance on navigation specifications*

Night means the hours between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise, as may be prescribed by the appropriate authority.

O

Obstacle Clearance Altitude (OCA) or "**Obstacle Clearance Height (OCH)** means the lowest altitude or the lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria.

Note 1:- *Obstacle clearance altitude is referenced to mean sea level and obstacle clearance height is referenced to the threshold elevation or in the case of non-precision approaches procedures to the aerodrome elevation or the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. An obstacle clearance height for a circling approach is referenced to the aerodrome elevation.*

Operating Base means the location from which operational control is exercised.

Note:- *An operating base is normally the location where personnel involved in the operation of the aircraft work and the records associated with the operation are located. An operating base has a degree of permanency beyond that of a regular point of call.*

Operation An activity or group of activities which are subject to the same or similar hazards and which require a set of equipment to be specified, or the achievement and maintenance of a set of pilot competencies, to eliminate or mitigate the risk of such hazards.

Note:- *Such activities could include, but would not be limited to, offshore operations, HELI-hoist operations or emergency medical service.*

Operational Control means the exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of the flight.

Operational Flight Plan means the operator's plan for the safe conduct of the flight based on considerations of aeroplane performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes concerned.

Operations Manual means a manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties.

Operator means the person, organization or enterprise engaged in or offering to engage in an aircraft operation.

Operations Specifications means the authorizations including specific approvals, conditions and limitations associated with the air operator certificate and subject to the conditions in the operations manual

Outsourcing see definition in Service Provider

P

Passenger Aircraft means an aircraft that carries any person other than a crew member, employee of the operator in an official capacity, an Authorised Officer or a person accompanying a consignment or other cargo.

Performance-Based Communication (PBC) means communication based on performance specifications applied to the provision of air traffic services.

Note:- *An RCP specification includes communication performance requirement that are allocated to system components in terms of the communication to be provided and associated transaction time, continuity, available, integrity, safety and functionality needed for the proposed operation in the context of a particular airspace concept.*

Performance-Based Navigation (PBN) Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.

Note:- *Performance requirements are expressed in navigation specifications (RNAV specification, RNP specification) in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept.*

Performance-Base Surveillance (PBS) means surveillance based on performance specifications applied to be the provision of air traffic service.

Note:- *An RSP specification includes surveillance performance requirements that are allocated to system components in terms of the surveillance to be provide and associated data delivery time, continuity, availability, integrity, accuracy of the surveillance data, safety and functionality needed for the proposed operation in the context of the particular airspace concept.*

Pilot-In-Command The pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight.

Point of No Return (PNR) means the last possible geographic point at which an aircraft can proceed to the destination aerodrome as well as to an available enroute alternate aerodrome for a given flight.

Pressure-Altitude An atmospheric pressure expressed in terms of altitude which corresponds to that pressure in the Standard Atmosphere.

Note:- *The Standard Atmosphere as defined in ICAO Annex 8 means:*

(a) The air is a perfect dry gas;

(b) The physical constants are:

— Sea level Mean Molar Mass:

$M_0 = 28.964420 \times 10^{-3}$ kg mol^{-1}

— Sea level Atmospheric Pressure: $P_0 = 1013.250$ hPa

— Sea level temperature:

$t_0 = 15°C$

$T_0 = 288.15$ K

— Sea level atmospheric density: $\rho_0 = 1.2250$ kg m^{-3}

— Temperature of the ice point: $T_i = 273.15$ K

— Universal gas constant:

$R^* = 8.31432$ JK^{1}mol^{-1}

Psychoactive Substances means alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine, other psychostimulants, hallucinogens, and volatile solvents, but excludes coffee and tobacco.

Public Transport has the same interpretation as commercial air transport.

Q

Qualification Test Guide (QTG) The primary reference document used for the evaluation of a FSTD. It contains test results, statements of compliance and the other prescribed information to enable the evaluator to assess if the FSTD meets the test criteria.

Quality Management System (QMS) means a management system that directs and controls an organization with regard to quality activities generally include the following:

(a) Establishment of A Quality Policy and Quality Objectives;

(b) Quality planning;

(c) Quality control;

(d) Quality assurance; and

(e) Quality improvement.

R

Required Communication Performance (RCP) Specification means a set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based communication.

Required Surveillance Performance (RSP) Specification means a set of requirements for air traffic services provision and associated ground equipment, aircraft capability, and operations needed to support performance-based surveillance.

Repair means the restoration of aircraft, engine, propeller or associated part to an airworthy condition in accordance with the appropriate airworthiness requirements, after it has been damaged or subjected to wear.

Rest Period means a continuous and defined period of time, subsequent to and/or prior to duty, during which flight or cabin crew members are free of all duties.

Runway Visual Range (RVR) means the range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line.

S

Safe Forced Landing means unavoidable landing or ditching with a reasonable expectancy of no injuries to persons in the aircraft or on the surface.

Safety Management System means a systematic approach to managing safety, including the necessary organizational structures, accountabilities, responsibilities, policies and procedures.

Serious injury. An injury which is sustained by a person in an accident and which:

(a) Requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; or

(b) Results in a fracture of any bone (except simple fractures of fingers, toes or nose); or

(c) Involves lacerations which cause severe haemorrhage, nerve, muscle or tendon damage; or

(d) Involves injury to any internal organ; or

(e) Involves second or third degree burns, or any burns affecting more than 5 per cent of the body surface; or

(f) Involves verified exposure to infectious substances or injurious radiation.

Service Level Agreement (SLA) means a formal agreement, usually as part of a contract, between an operator and an external services provider, or in some cases, and internal services provider, that:

(a) Specifies, in measurable terms, the services the external provider is expected to perform;

(b) Becomes the basis for monitoring of the performance of the external services provider by the operator; and

(c) Defined and agreed as the impact of poor service can also affect the airport which may suffer reputational damage or loss of revenue.

Service Provider means the business practice whereby one party (e.g. an operator or provider) transfers, usually under the terms of a contract or binding agreement, the conduct of an operational function to a second party (e.g. an external service provider). Under outsourcing, the first party retains responsibility for the output or results of the operational function even though it is conducted by the second party.

Shall means a procedure is mandatory as necessary for the safety or regularity of international civil aviation to comply with all standards at all times.

Should means a procedure is recommended in the interests of safety, regularity, or efficiency of international civil aviation with recommended practices.

Small Aeroplane means an aeroplane of a maximum certificated take-off mass of 5 700 kg or less.

Special Categories Passengers means persons who need special conditions, assistance, or equipment when travelling by air. These may include but are not limited to:

(a) Infants;

(b) Unaccompanied children;

(c) Persons with disabilities;

(d) Persons with mobility impairments;

(e) Persons on stretchers; and

(f) Inadmissible passenger, deportees, or persons in custody.

Specific Approval means an approval which is documented in the Operations Specifications for commercial air transport operations or in the list of specific approvals for non-commercial operations.

Note:- *The terms authorization, specific approval, approval and acceptance are further described in ICAO Annex 6 Part I Attachment D.*

State of Design refers to the State having jurisdiction over the organization responsible for the type design.

State of Destination means the State in the territory of which the consignment is finally to be unloaded form an aircraft.

State of Origin means the state in the territory of which the consignment is first to be loaded on aircraft.

State of Registry means the State on whose register the aircraft is entered.

State of the Aerodrome means the State in whose territory the aerodrome is located.

State of the Operator. means the State in which the operator's principal place of business is located or, if there is no such place of business, the operator's permanent residence.

Synthetic Vision System (SVS) means a system to display data-derived synthetic images of the external scene from the perspective of the flight deck.

T

Target Level of Safety (TLS) means a generic term representing the level of risk which is considered acceptable in particular circumstances.

Technical Instructions (TI) means the technical instructions for the safe transport of dangerous goods by air (Doc 9284), approved and issued periodically in accordance with the procedure established by the ICAO Council.

Threshold Time means the range, expressed in time, established by the State of the Operator, to an en-route alternate aerodrome, whereby any time beyond requires a specific approval for EDTO from the State of the Operator

Total Vertical Error (TVE) means the vertical geometric difference between the actual pressure altitude flown by an aircraft and its assigned pressure altitude (flight level).

V

Visual Meteorological Conditions (VMC) means meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, equal to or better than specified minima.

W

Wet Runway means the runway surface is covered by any visible dampness or water up to and including 3 mm deep within the intended area of use.

CHAPTER 1

APPLICATION FOR AIR OPERATOR CERTIFICATE

1 INITIAL APPLICATION FOR AOC

1.1 The application for, and grant of, an AOC is a complicated process involving much effort and detailed work by both the applicant and the Authority. Hence, an applicant should contact the Authority as far in advance as possible, and submit all required manuals and documents, at least 90 days before the anticipated start of operations. The time taken to process an application will depend on the completeness of the information submitted and the progress the applicant makes in demonstrating an adequate organisation, method of control and supervision of flight operations, training programme and maintenance arrangements consistent with the nature and extent of the operations specified. Nevertheless, no undertaking can be given for an AOC to be granted within any requested timeframe.

1.2 A 5-phase process for systematic handling of all AOC applications has been adopted. The 5 phases are explained briefly below:

(a) Pre-application phase

This phase commences when a prospective applicant makes his initial inquiries regarding application for an AOC. A preliminary discussion is held whereby basic information and general certification requirements are discussed, and an application form (see Appendix A for the application form) is provided when the applicant desires to continue with the AOC application. When the information is sufficient including the financial status, a pre-application meeting is arranged, at which the applicants' key management and staff will meet with the Authority to discuss the plans and specific aspects of the proposed operation.

(b) Formal application phase

This phase begins when the applicant submits the completed form and required manuals and exposition documents to the Authority. This phase shall commence at least 90 days before the desired start of revenue operations. After preliminary review to verify that the applicant has submitted the required information and attachments, a formal application meeting with the applicant's management team will be arranged where detailed examination of all aspects of proposed aircraft types and their operations, management structure, ground and flight crew and cabin crew structure and training, premises, equipment, etc. will be conducted. The applicant's proposed schedule of events for submissions, inspections and training of the Authority's officers on the proposed aircraft type(s) (at the applicant's expense) will be examined and agreed by both parties to guide the subsequent phases.

(c) Document evaluation phase

A thorough evaluation of all the manuals, documents and attachments etc. that are required by regulations to be submitted to support an AOC application will begin in this phase. This is to ensure that all documentation meets the required standards and requirements. All manuals and documents submitted will also be retained by the Authority during the currency of an AOC (see Chapter 2).

(d) Applicant's demonstration and Authority's evaluation phase

An applicant is required to demonstrate his ability to comply with regulations and safe operating practices before actual revenue operations can begin. This is to ensure that the applicant has an adequate organisation, method of control and supervision of flight operations, training programme as well as ground handling1 and maintenance arrangement that are consistent with the nature and extent of operations specified. These may include emergency evacuation demonstration, ditching demonstration, one or more proving flights over proposed routes. Where actual performance of activities (maintenance and ground handling[1] and the use of dummy loads where appropriate) and operations, are observed and evaluated by the Authority. All operations must be performed in accordance with applicant's documents and manuals as reviewed in the previous phase. However, the Authority may require additional time or additional proving flights to validate the ability and overall safe operations before concluding this phase. On completion of the demonstration and evaluation phase, the Authority will normally call for a meeting with the applicant to review the results or any findings to be resolved before the Certification phase.

Note: *Guidelines for Emergency Evacuation and Ditching Demonstration, refer to CAAT Emergency Evacuation and Ditching Demonstration Guidance Material.*

(e) Certification phase

After all documentation has been assessed to be complete including both operational and financial capability, the demonstration phase has been completed satisfactorily, and the applicant is assessed to be competent, the AOC will be issued with the corresponding operations specifications (containing authorisations, limitations and provisions specific to each applicant) to enable the applicant to commence revenue operations.

1.3 If any significant deficiency is revealed at any stage of the evaluation process and the deficiency cannot be resolved by the interaction between the Authority and the applicant, the Authority will advise the applicant in writing of the nature of the deficiency and the actions required. The application will not be processed until the deficiency is resolved.

2 DOCUMENTS TO BE SUBMITTED

2.1 The following documents must be submitted to the Authority together with the completed form:

(a) Operations Manual;

(b) Aircraft Flight Manual;

(c) General Maintenance Manual - GMM;

(d) Aircraft Maintenance Program Manual;

(e) Minimum Equipment List;

[1] Ground handling includes services that are necessary for an aircraft's arrival at, and departure from, an airport, other than air traffic services.

(f) Training Manual (Flight Crew, Cabin Crew, Dispatcher and Ground Staff);

(g) Dangerous Goods Manual; (if applicable)

(h) Security Manual;

(i) Safety Management Manual;

(j) Emergency Manual;

(k) Flight Operations Officer or Dispatcher Manual;

(l) Cabin Crew Manual;

(m) Quality Assurance Manual; and

(n) Other manual if the Authority required such as the Ground Handling / Services Manual.

3 FORM OF AIR OPERATOR CERTIFICATE AND OPERATIONS SPECIFICATIONS

3.1 Air Operator Certificate is normally valid for not more than 2 years for initial issue. Thereafter, it may be renewed for not more than 5 years subject to the satisfaction of the Authority. The type(s) of aircraft that may be flown and the associated specific approvals are specified in the operations specifications.

3.2 See Appendix A for a format of the AOC, Operations Specifications and the associated forms.

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4 APPLICATION FOR THE RENEWAL OF AN AOC

4.1 The period of validity of an AOC will not be extended.

4.2 Holders of AOC must apply for the renewal of an AOC using application form (see Appendix A), including any other forms or documents that may be required, at least 60 days before the expiry date of the current AOC.

4.3 The audit and routine inspection results will be used to assess whether the operator can continue to hold an AOC.

5 VARIATIONS TO EXISTING AOC

5.1 If the holder of an AOC wishes to add new aircraft (same make/model) or apply for the variation of its certificate (e. g. inclusion of new aircraft type, adding specific approval destination or extension of routes or changes in Operations Specifications) the holder of the AOC shall complete the Application (see Appendix A) for an AOC Variation with full details of the requested amendments and submit all required manuals and documents at least 45 days in advance. However, the AOC holder is advised to give as much notice as possible. No undertaking can be given that an application will be dealt with within any requested timeframe. Variation to the AOC also includes apply or changes to the following:

(a) Change in particular of organisation;

(b) Change in management personnel;

(c) Inclusion of new aircraft type;

(d) Adding new aircraft (Same make/model).

(e) Change in area of operation;

(f) Change in aircraft maintenance;

(g) Change in specific approval such as EDTO/ETOPS, RVSM, EFB, DG, PBN, PBCS, AWO etc; and

(h) Removal of aircraft registration from Operations Specifications

Note: *Justification of the suitability of a person to become Chief Executive Officer will be required.*

5.2 On receipt of application for an AOC variation, demonstration or special inspection may be conducted which include the observation of a proving flight. After all documentation is complete and upon satisfactory completion of any special inspection, the relevant amended page of the AOC or the operations specifications will be sent to the operator as approval for the requested variation to the AOC.

5.3 In case of introduction of the new aircraft type in the company, while the Authority does not have type-rated officer or have type-rated officer but not adequately meet the overall number of such aircraft type, the AOC holder shall provide aircraft type training for the new aircraft type to the Authority's Officers, at the expense of the AOC holder.

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6 ROUTINE LIAISON AND INSPECTION

6.1 To determine continued competence and compliance by the operator with the applicable requirements, the operator shall permit access to Authorised Officers to its premises, aircraft, equipment and documents, including those handling agents appointed by the operator.

6.2 All Authorised Officers are authorised to be on-board the operator's aircraft, including its flight deck, during normal aircraft operations. Arrangements for such flights will normally be made in advance, but Authorised Officers may also board the aircraft without prior notice to conduct unscheduled inspection. For identifications, all Authorised Officers will carry a credential card which will be produced on request.

6.3 The Authority shall not pay any fee or fare to the operator in the respect of the carriage of an Authorised Officer on duty in the operator's aircraft or the aircraft of other airlines. The cost of the passenger ticket including all applicable taxes and fees purchased by the Authority for the Authorised Officer to perform duties outside CAAT shall be borne by the operator. Alternatively, the operator may, subject to agreement of the Authority, issue a confirmed commercial passenger ticket where all applicable taxes and fees have been paid for. For the purpose of this sub-paragraph, a "subject to load" ticket is not acceptable to the Authority. When circumstances require Authorised Officers to travel on freighter flights, he/she shall be listed in the General Declaration or passenger manifest. A confirmed seat outside the flight deck will be acceptable.

When AOC is granted, the applicant is subject to continuing surveillance to ensure that the operator remains competent to undertake the safe operation. The cost of the AOC surveillance, other than main base inspection, including any ground transportation, air tickets, hotel accommodations and any expense paid by the Authority for the Authorised Officer to perform duties outside CAAT shall be borne by the operator.

6.4 Operators will be visited from time to time by Authorised Officers. The primary purpose of their visits will be to observe the operations of the AOC holder. This will include the training and checking and qualifications of the operating staff and agents/contractors of the AOC holder.

6.5 The Authorised Officers are also empowered to inspect the licenses of the flight crew and aircraft maintenance engineers, and records of the AOC holder and their agents.

6.6 Pursuant to Article 16 of the Chicago Convention, the AOC holders may from time to time undergo a ramp inspection by a foreign authority when landing or departing outside the territory of Thailand. The ramp inspection report should be emailed to the authority at contact.faoc@caat.or.th

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7 MANAGEMENT AND EXECUTIVE STAFF

7.1 A sound and effective management structure is essential. It is particularly important that the operational management should have proper status in the organisation and be in suitably experienced and competent hands. The duties and responsibilities of managers, senior executives and designated representatives in charge of operational control must be clearly defined in writing, and chains of responsibility firmly established. Authorities are clearly defined with functional tasks and lines of responsibility clearly delineated and documented in the flight safety documents system. The number and nature of the appointments may vary with the size and complexity of the organisation and its operations. However, the structure and composition of the management must be adequate and properly matched to the operating network and commitments. The operator shall maintain personnel trained and competent to perform their tasks.

7.2 Personnel

The Chief Executive Officer (who shall be the accountable manager) of the operator, taking into consideration the complexity and nature of the operations, shall nominate the following persons for the Authority's acceptance:

(a) **Head of Flight Operations** - He/she should have relevant qualifications and management experience working in an airline or equivalent organisation.

(b) **Head of Engineering** - He/she should have experience working in an engineering capacity in an airline or equivalent organisation.

(c) **Head of Safety** - He/she should have operational experience working in an airline or equivalent organization on aviation safety management, and he/she should have sound technical background to understand the systems that support operations or the product/service provided.

(d) **Head of Quality** - He/she should have operational experience working in an airline or equivalent organization on quality management, and he/she should have sound technical background to understand the systems that support operations or the product/service provided.

Note: *(Organisational setup for head of quality is detailed in Appendix Q, paragraph 2.3)*

(e) **Head of Training** - He/ she should hold an ATPL or a current type rating instructor on a type/class operated under the operator. He/she should have a thorough knowledge of the AOC holder's crew training concept for flight, cabin, and when relevant to other crew. The nominated head of training should have the overall responsibility to ensure that the training is in compliance with the appropriate requirements.

Note*: For the aircraft used by the operator, the maximum take-off weight not exceeding 5,700 kilograms, the nominated head of training should hold a Commercial Pilot License, Instrument Rating, Flight Instructor Pilot (IP) Rating and currently act as Pilot in Command of one type of operator's aircraft.*

(f) **Head of Ground Operations** - He/ she should have experience or knowledge in ground handling services. Where maintenance and other ground handling functions

is performed by a contractor and not directly by the operator, a senior person employed by the operator should be nominated to co-ordinate arrangements and to provide continuous liaison with the maintenance contractor on airworthiness matters and ground handling matters.

7.3 These nominated persons shall be conversant with the Thai Ministerial Regulations, the Air Operator Certificate Requirements, the Authority Airworthiness Requirements and the relevant Annexes to the Chicago Convention and have adequate qualifications and experience for the duties concerned.

7.4 The Authority may, depending on the type of operations, require the operator to nominate additional persons to ensure the safety of the operations or allow for a nominated person to take on more than one role.

7.5 Quality Management System

7.5.1 The operator shall establish a quality management system with the objective of compliance monitoring and designated Head of Quality to monitor the compliance with, and adequacy of, procedures required to ensure safe operational practices and airworthy aircraft. The compliance monitoring shall include a direct feedback system to the accountable manager to ensure corrective action as necessary.

The requirements for the quality management system and compliance monitoring are detailed in Appendix Q. The specific requirements for the Engineering and Maintenance quality system are detailed in Chapter 9 of this document.

7.6 The positions held by key personnel will be listed in each Air Operator Certificate.

8 DECISIONS OF THE AUTHORITY

8.1 Pursuant to the Thailand RCAB 85, the Authority may refuse to grant or renew an AOC.

8.2 If, during the currency of an AOC, the Authority ceases to be satisfied that the holder is competent, the Authority may suspend, revoke or vary the AOC. The holder would normally be given at least one month's notice of the intention to take such action and will be notified in writing to take such action, but provision is made for immediate suspension, revocation or variation if the Authority determines that it is necessary in the interests of the safety of flight operations.

8.3 If an operator ceases operations for which the AOC was issued, or if the Authority revokes or suspends the AOC, the AOC is to be returned to the Authority within 7 days.

9 AIRCRAFT LEASING ARRANGEMENTS

9.1 The operator shall seek the Authority's approval before engaging in aircraft operational lease arrangements (i.e. dry/wet/damp leases).

9.2 Approval for any operational lease arrangement will only be granted provided the parties have identified all the necessary responsibilities arising from the lease arrangement and the parties involved in the lease arrangement can demonstrate sufficient knowledge and adequate resources to fulfil their roles and responsibilities with regard to the continuing airworthiness and operational control of the aircraft for the duration of the lease.

9.3 Any proposal of amendment affecting the roles and responsibilities with regard to the continuing airworthiness and operational control of the aircraft of the approved lease arrangement shall be notified to CAAT before engagement.

10 OPERATIONAL CERTIFICATION AND SUPERVISION

10.1 The operator shall not engage in commercial air transport operations unless in possession of a valid air operator certificate issued by the Authority.

10.2 The operator shall develop policies and procedures for third parties that perform work on its behalf.

11 SAFETY MANAGEMENT

11.1 An operator shall implement a safety management system acceptable to the State of the Operator that, as a minimum that is based on ICAO Doc 9859 and Guidance Material for SMS:

(a) Identifies safety hazards;

(b) Ensures that remedial action necessary to maintain an acceptable level of safety is implemented;

(c) Provides for continuous monitoring and regular assessment of the safety level achieved;

(d) Aims to make continuous improvement to the overall level of safety; and

(e) The operator shall notify Safety Performance Indicators (SPI) with respective alert/target levels to the Authority.

11.2 A safety management system shall clearly define lines of safety accountability throughout the operator's organisation, including a direct accountability for safety on the part of senior management.

11.3 An operator of an aeroplane of a certificated take-off mass in excess of 27,000 kg shall establish and maintain a flight data analysis programme as part of its safety management system.

Note: *An operator may contract the operation of a flight data analysis programme to another party while retaining overall responsibility for the maintenance of such a programme.*

11.4 A flight data analysis programme shall contain adequate safeguards to protect the source(s) of the data in accordance with Appendix 3 to Annex 19.

Note: *Guidance on the establishment of flight data analysis programmes is included in the Manual on Flight Data Analysis Programmes (FDAP) (Doc 10000).*

11.5 An operator shall establish a flight safety documents system, for the use and guidance of operational personnel, as part of its safety management system in accordance with Appendix K.

Note: *Guidance on the development and organisation of a flight safety documents system is provided in ICAO Annex 6 Part I, Attachment F (Tenth edition – July 2016).*

11.6 The operator shall not use recordings or transcripts of CVR, CARS, Class A AIR and Class A AIRS for purposes other than the investigation of an accident or incident as per Annex 13, except where the recordings or transcripts are:

(a) Related to a safety-related event identified in the context of a safety management system; are restricted to the relevant portions of a de-identified transcript of the recording; and are subject to the protections accorded by Annex 19;

(b) Sought for use in criminal proceedings not related to an event involving an accident or incident investigation and are subject to the protections accorded by Annex 19; or

(c) Used for inspections of flight recorder systems.

Note: *Provisions on the protection of safety data, safety information and related sources are contained in Appendix 3 to Annex 19. When an investigation under Annex 13 is instituted, investigation records are subject to the protections accorded by Annex 13.*

11.7 The use of recordings or transcripts of FDR, ADRS as well as Class B and Class C AIR and AIRS for purposes other than the investigation of an accident or incident as per Annex 13 shall not be allowed, except where the recordings or transcripts are subject to the protections accorded by Annex 19 and are:

(a) Used by the operator for airworthiness or maintenance purposes;

(b) Used by the operator in the operation of a flight data analysis programme as part of its safety management system;

(c) Sought for use in proceedings not related to an event involving an accident or incident investigation;

(d) De-identified; or

(e) Disclosed under secure procedures.

Note. *Provisions on the protection of safety data, safety information and related sources are contained in Appendix 3 to Annex 19.*

11.8 In order to decide whether or not to operate into airspace forecasted to be, or aerodromes known to be, contaminated with volcanic ash, the operator should have in place an identifiable safety risk assessment within its SMS.

Note: *Guidance on the risk management of flight operations with known or forecasted volcanic ash contamination is provided in ICAO Doc 9974 – Flight Safety and Volcanic Ash. Procedures recommended for use by pilots whose aircraft inadvertently encounter a volcanic ash cloud and for post-flight reporting can be found in ICAO Doc 9691 – Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds.*

12 EXEMPTIONS, PERMISSIONS AND APPROVALS

12.1 Exemptions, Permissions and Approvals issued by the Authority are usually valid for a finite period and have a notified expiry date. The AOC Holders are responsible for ensuring that any Exemptions, Permissions and Approvals remain valid, and should apply for re-validation well before time expiry.

12.2 Compliance with requirements is not optional. Occasionally, however, particularly in the area of aerodrome infrastructure, there might be instances where there are insurmountable geographical or other physical problems. When there are appropriate, robust and documented regulatory mechanisms in place, and when not in conflict with the ICAO Annexes, the objective of a specific SARP, or a good accepted safety practice, it may be possible to resolve a discrepancy or shortcoming by the imposition of limiting conditions or compensatory measures/controls. However, it is important not to imply that exemptions /exceptions be used to overcome an unpopular requirement or that compliance with a requirement is optional. The use of such mechanisms must be regarded as the exception, not the norm.

12.3 Furthermore, any exception should only be granted on the basis of the robust rationale. Therefore, risk analysis or aeronautical study techniques should be developed, as part of a Safety Management System (SMS), at the appropriate level. In such exceptional cases, the responsibility for justifying, either qualitatively or quantitatively, an alternative means of compliance lies with the operator, before approval is sought from the Authority. Furthermore, the operator must regularly review any exceptions with a view to removing the need for an exception where possible, as well as check the validity and robustness of any mitigating measures in place. The Authority must also assess, before granting and exemption or exception, whether the exemptions or exceptions would lead to differences from SARPs.

12.4 Operations conducted under the conditions of an Exemption, Permission or Approval that has lapsed, are in breach of the law.

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13 EMERGENCY EVACUATION DEMONSTRATION AND DITCHING DEMONSTRATION

An AOC applicant is required to demonstrate his ability to comply with regulations and safe operating practices before actual revenue operations can begin. An evacuation demonstration is required for each aircraft type with a seating capacity of more than 44 seats. This is to ensure that the applicant has an adequate organisation, method of control and supervision of flight operations, training programme as well as ground handling and maintenance arrangement that are consistent with the nature and extent of operations specified. These may include emergency evacuation demonstration, ditching demonstration, one or more proving flights where actual performance of activities (maintenance and ground handling and the use of dummy loads where appropriate) and operations, are observed and evaluated by the Authority. All operations must be performed in accordance with applicant's documents and manuals as reviewed in the previous phase. However, the Authority may require additional time or additional proving flights to validate the ability and overall safe operations before concluding this phase. On completion of the demonstration and evaluation phase, the Authority will normally call for a meeting with the applicant to review the results or any findings to be resolved before the certification phase.

13.1 Evaluation of Passenger Evacuation Capability/Emergency Evacuation Demonstrations

13.1.1 Aircraft certification specifications/standards require that before an aircraft type and model can be used in commercial air transport passenger-carrying operations an actual full capacity emergency evacuation demonstration has been conducted to check the suitability of the emergency equipment and to determine the maximum number of persons on board. All passengers must be evacuated from the aircraft within 90 seconds or less, by using not more than 50 percent of the available floor-level emergency exits.

13.1.2 Engineering analysis and historical data can be used to validate other passenger seating configurations. Prior to the import of an aircraft into Thailand and Certificate of Airworthiness issuance, an interior inspection shall be conducted to ensure conformity to an approved interior configuration, emergency and safety equipment, and that there is documentation to confirm that the full capacity emergency evacuation has been completed satisfactorily.

13.1.3 For issuance of an AOC or variation to an AOC, the applicant is required to establish, to the satisfaction of the Authority, procedures to be followed, assignment of duties, qualifications of crew members and equipment to be used that will permit an emergency evacuation in 90 seconds or less, of the maximum number of persons, including crew members, authorized to be carried on each type of aircraft used in commercial air transport operations.

13.1.4 Emergency evacuation training and competency requirements for crew members are established in Chapter 6 of this document. As part of the document evaluation, the Authority will determine that the applicant has established a training programme that ensures the crew members are competent in executing those safety duties and functions to be performed in the event of an emergency evacuation in order to verify the adequacy of aircraft emergency procedures, crew member emergency evacuation training and emergency equipment.

13.1.5 If reliable analytical methods or previous demonstrations by the aircraft manufacturer or other operators of the same type and model of aircraft **are available** to satisfy the

Authority of the applicant's emergency evacuation capability, a partial evacuation demonstration (without slide inflation) is required in the certification inspection to verify the adequacy of applicant's emergency procedures and crew competency in an emergency evacuation.

If reliable analytical methods or previous demonstrations by the aircraft manufacturer or other operators of the same type and model of aircraft **are not available** to satisfy the Authority of the applicant's emergency evacuation capability, a full evacuation demonstration is required.

13.1.6 In this partial evacuation demonstration (without slide inflation), full complement of crew members is required to carry out the procedures for an emergency evacuation, including opening 50 percent of emergency exit door and successfully simulated deploying the escape slide (if fitted) at those exits within 15 seconds or less. Specific points to be noted during an evacuation demonstration are:

(a) The adherence by crew members to the execution of assigned duties and responsibilities both in the aircraft and on the ground;

(b) The location of each crew member during the evacuation;

(c) The effectiveness of the Pilot-in-Command in the exercise of command responsibilities;

(d) The succession of command in the event of casualties;

(e) The effectiveness of crew members in performing their assigned evacuation duties; and

(f) The shortcomings, deficiencies or delays encountered.

13.1.7 In making their report on the demonstration, the Authority will record the time to open each approved exit door from the time each phase of the evacuation demonstration begins.

13.1.8 If the applicant cannot satisfactorily demonstrate emergency evacuation for each particular type, model and configuration of aircraft within the time limit specified by the Authority, the applicant should be required to take steps to correct the deficiency which could include the following:

(a) Revising evacuation procedures;

(b) Improving crew members training;

(c) Modifying or changing the equipment used;

(d) Changing the passenger compartment arrangement; and

(e) Reducing total passenger seating capacity.

13.2 Evaluation of Passenger Ditching Capability/Ditching Demonstration

13.2.1 An operator intending to use an aircraft in extended flights overwater is required to demonstrate to the Authority that the aircraft has the ability and equipment to carry out emergency ditching procedures. The aircraft documentation shall be reviewed to ensure that an aircraft intended to be used for extended flights overwater has an airworthiness certification covering ditching. If the aircraft is not certificated for ditching, extended flights over water will not be authorized.

13.2.2 Ditching training and competency requirements for crew members are established in Chapter 6 of this document. The Authority will determine that the applicant has established a training programme that ensures the crew members are competent in executing those safety duties and functions to be performed in the event of a situation requiring ditching.

13.2.3 The applicant will be required to provide a simulated ditching demonstration (without slide inflation) during the operational inspection phase of the certification process for each aircraft type, model and configuration which will be operated on extended flights over water. The purpose of the demonstration is to evaluate the operator's ability to safely prepare passengers, airplane, and ditching equipment for a planned water landing.

13.2.4 The following are specific points to be noted and evaluated during a ditching demonstration:

(a) Was adequate preparation of the passengers and aircraft for a premeditated ditching conducted?

(b) Were there adequate items of emergency equipment, i.e. life rafts, inflatable slides, life jackets, medical kits, first aid kits and emergency locator transmitter (ELT), carried on board in sufficient number?

(c) Was emergency equipment properly stowed and could it be readily removed or ejected from the aircraft (as required)?

(d) Were the emergency exits to be utilized selected, and could such exits be opened readily?

(e) Were emergency procedures and related checklists adequate, and were they properly used by the crew members?

(f) Were the crew members properly trained?

(g) Were crew members familiar with and did they adhere to the timely execution of their assigned duties and responsibilities?

13.2.5 In the observation of the demonstration, to assist in the assessment of the ditching demonstration, the Authority will record the time from the ditching demonstration starts until each emergency exit has been opened.

13.2.6 Any deficiencies identified during the evaluation conducted by the Authority's certification team or noted during the ditching demonstration regarding the evacuation procedures or related emergency equipment are to be rectified by the applicant. This may require additional evaluation or demonstrations before these emergency procedures can be considered acceptable by the Authority's certification team.

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CHAPTER 2
OPERATIONS REQUIREMENTS

1 PURPOSE AND SCOPE OF OPERATIONS MANUALS

1.1 Pursuant to Thailand RCAB 85 paragraph 3 (15a), the operator shall ensure that an Operations Manual containing information and instructions as may be necessary to enable the operating staff to perform their duties is provided to such staff.

1.2 The purpose of this Chapter is to give some indication of the manner in which both the specific and general requirements (paragraph 1.1 of this chapter) should be met. Only the operation of aircraft will be dealt with; detailed instructions on aircraft maintenance (such as those included in a General Maintenance Manual (GMM) or in Maintenance Schedules) are in Chapter 9 of this AOCR and in the Authority Airworthiness Requirements.

1.3 By definition included in the above Act, "operating staff" means the servants and agents employed by the operator, whether or not as members of the crew of the aircraft, to ensure that the flights of the aircraft are conducted in a safe manner and includes an operator who him/herself performs these functions.

1.4 The operator shall ensure that all personnel are able to understand the language in which those parts of the Operations Manual which pertain to their duties and responsibilities are written. The content of the Operations Manual shall be presented in a form that can be used without difficulty and observes human factors principles.

1.5 All operating staff shall have easy access to the portions of the Operations Manual that are relevant to their duties. The Operations Manual or parts thereof may be presented in any form, including electronic form. In all cases, the accessibility, usability, and reliability should be assured.

1.6 Great importance will be attached to the suitability of manuals for regular use by the operating staff and in particular by aircraft crew in flight. For all but the simplest of operations, the division of the manual into a number of separate volumes will be essential. Manuals should be divided in such a way that essential information is immediately available on the flight deck, and extracts or "digests" of information and instructions may sometimes be necessary to supplement drill cards and check lists.

1.7 The operations manual (OM);

(a) May vary in detail according to the complexity of the operation and of the type and number of aircraft operated.

(b) The OM or parts thereof may be presented in any form, including electronic form. In all cases, the accessibility, usability and reliability should be assured.

(c) The OM should be such that:

(i) all parts of the manual are consistent and compatible in form and content;

(ii) the manual can be readily amended; and

(iii) the content and amendment status of the manual is controlled and clearly indicated.

1.8 The OM content may be based on, or may refer to, industry codes of practice.

1.9 When compiling an OM, the operator may take advantage of the contents of other relevant documents. The material produced by the operator for the type-related part of the OM may be supplemented with, or substituted by, applicable parts of the aircraft flight manual (AFM) or, where such a document exists, by an aircraft operating manual produced by the manufacturer of the aircraft.

1.10 In the case of commercial operations with other than large aeroplanes or non-commercial operations, a 'pilot operating handbook' (POH), or equivalent document, may be used as the type-related part of the OM, provided that the POH covers the normal and abnormal/emergency operating procedures.

1.11 For the route and aerodrome part of the OM, material produced by the operator may be supplemented with or substituted by applicable route guide material produced by a specialist company.

1.12 If the operator chooses to use material from another source in the OM, either the applicable material should be copied and included directly in the relevant part of the OM, or the OM should contain a reference to the appropriate section of that applicable material.

1.13 If the operator chooses to make use of material from another source (e.g. a route manual producer, an aircraft manufacturer, or a training organisation), this does not absolve the operator from the responsibility of verifying the applicability and suitability of this material. Any material received from an external source should be given its status by a statement in the OM.

1.14 The operator shall submit its Operations manual and subsequent amendments to the Authority for the acceptance or approval, as applicable, before issuing them to their users. The purpose of the acceptance and approval process is to verify the adequacy of the operator's systems and procedures for keeping instructions and information under review and for issuing timely amendments as necessary. Evidence of such a process is normally supported by the date, stamp, and signature of an authorized officer.

The operator is responsible for ensuring the accuracy and adequacy of the information provided in the manuals. It must be clearly understood by the operator that this responsibility rests solely with the operator, who should designate a suitably qualified person or persons to ensure that this responsibility is properly discharged.

1.15 The OM should include a description of its amendment and revision process, specifying:

(a) the person(s) who may approve amendments or revisions;

(b) the conditions for temporary revisions and/or immediate amendments or revision required in the interest of safety; and

(c) the methods by which operator personnel are advised of the changes.

1.16 The operator shall incorporate all amendments and revisions required by the authority. The OM shall be kept up to date. All personnel shall be made aware of the changes that are relevant to their duties.

1.17 All operators are required to have adequate procedures to ensure that the flight manual is updated by implementing changes made mandatory or approved by the State of Registry.

1.18 An operations manual shall be organized with the structure that can be found in ICAO Annex 6 Part I Appendix 2, and Appendix B of this document contains the use and guidance of a structured operations manual.

2 CREW TO BE CARRIED

2.1 The operator must designate one pilot amongst the flight crew as pilot in command.

2.2 It will normally be sufficient if the minimum crew of public transport is specified in the manual for each type of aircraft, together with a reference to the necessity for specialist crew members where appropriate. Note that the minimum crew for public transport will not necessarily be the same as the minimum crew specified in the Certificate of Airworthiness. In some cases, the operator will need to consider whether the particular circumstances of the operation call for the carriage of additional flight crew. It is a statutory requirement that an aircraft shall have a flight crew adequate in number and designation to ensure the safety of the flight.

2.3 Except where the flight crew is limited to one or two pilots, brief instructions should be included as to the order and circumstances in which command is to be assumed by members of the crew.

2.4 Detailed instructions must be included as to the circumstances in which co-pilots may be permitted to fly the aircraft.

2.5 An aeroplane shall not be operated under the IFR or at night by a single pilot unless:

(a) Approved by the Authority;

(b) The flight manual does not require a flight crew of more than one;

(c) The aeroplane is propeller-driven;

(d) The maximum approved passenger seating configuration is not more than 9;

(e) The maximum certificated take-off weight does not exceed 5700 kg;

(f) The Pilot-in-Command has satisfied requirements of experience, training, checking and regency described in Chapter 4 para 19; and

(g) The aeroplane is equipped with:

(i) A serviceable autopilot that has at least altitude hold and heading select modes;

(ii) A headset with a boom microphone or equivalent; and

(iii) Means of displaying charts that enables them to be readable in all ambient conditions.

2.6 Flight crew members at duty stations.

(a) Take-off and Landing. All flight crew members required to be on flight deck duty must be at their station.

(b) En-route. All flight crew members required to be on flight deck duty shall remain at their stations except when their absence is necessary for the performance of duties in connection with the operation of the aircraft or for physiological needs. All flight crew members must keep their seat belts fasten when at their stations.

(c) Safety harness. Any flight crew member occupying a pilot's seat must keep the safety harness fastened during the take-off and landing phases; all other flight crew members must keep their safety harnesses fastened during the take-off and landing phases unless the shoulder straps interfere with the performance of their duties, in which case the shoulder straps may be unfastened but the seat belt must remain fastened.

Note: *Safety harness includes shoulder straps and a seat belt which may be used independently.*

2.7 Flight crew equipment

A flight crew member assessed as fit to exercise the privileges of a license, subject to the use of suitable correcting lenses, must have a spare set of the correcting lenses readily available when exercising those privileges.

3 DUTIES OF AIRCRAFT CREW AND OTHER OPERATING STAFF

In this context, the term "operating staff", as distinct from the aircraft crew, can be taken to mean staff having specific duties in relation to particular flights, which fall within the general pre-flight and in-flight responsibilities of the Pilot-in-Command. The manual must define the duties and responsibilities of people employed as:

(a) Pilot-in-Command of the aircraft;

(b) Flight operations officers /flight dispatchers;

(c) Rostering and scheduling staff.

3.1 Pilot-in-Command

(a) The Pilot-in-Command shall be responsible for the safety of all crew members, passengers and cargo on board when the doors are closed. The Pilot-in-Command shall also be responsible for the operation and safety of the aeroplane from the moment the aeroplane is ready to move for the purpose of taking off until the moment it finally comes to rest at the end of the flight and the engine(s) used as primary propulsion units are shut down.

(b) The Pilot-in-Command shall ensure that the checklists specified in paragraph 8 of this chapter are complied with in detail.

(c) The Pilot-in-Command shall be responsible for notifying the nearest appropriate authority by the quickest available means of any accident involving the aeroplane, resulting in serious injury or death of any person or substantial damage to the aeroplane or property.

(d) The Pilot-in-Command shall be responsible for reporting all known or suspected defects in the aeroplane, to the operator, at the termination of each flight sector.

(e) The Pilot-in-Command shall be responsible for the journey log book or the general declaration containing the information listed in Chapter 5, paragraph 11.4 of this document.

3.2 Flight operations officers/flight dispatchers shall, in conjunction with the operator's method of control and supervision of flight operations:

(a) Assist the Pilot-in-Command in flight preparation and provide the relevant information required;

(b) Assist the Pilot-in-Command in preparing the operational and ATS flight plans, sign when applicable and file the ATS flight plan with the appropriate ATS unit;

(c) Furnish the Pilot-in-Command while in flight, by appropriate means, with information which may be necessary for the safe conduct of the flight; and

(d) Notify the appropriate ATS unit when the position of the aeroplane cannot be determined by an aircraft tracking capability, and attempts to establish communication are unsuccessful.

3.3 In the event of an emergency, a flight operations officer/flight dispatcher shall:

(a) Initiate such procedures as outlined in the operations manual while avoiding taking any action that would conflict with ATC procedures;

(b) Convey safety-related information to the Pilot-in-Command that may be necessary for the safe conduct of the flight, including information related to any amendments to the flight plan that become necessary in the course of the flight; and

(c) Where necessary, notify the appropriate authorities without delay and request for assistance if required, if the emergency endangers the safety of the aircraft or persons and becomes known first to the flight operations officer/flight dispatcher.

Note: *It is equally important that the Pilot-in-Command also conveys similar information to the flight operations officer/flight dispatcher during the course of the flight, particularly in the context of emergency situations.*

3.4 In defining the duties of members of the aircraft crew, the operator should include instructions on:

(a) The briefing of passengers on emergency exits and equipment (including, where appropriate, life-jacket demonstration and use of "automatic drop-out" oxygen equipment) and restrictions of personal radio, tape recorder, headphones, laptop computers, etc. in flight;

(b) Who, in the absence of competent ground engineering staff, is responsible for supervising re-fueling and ensuring that filler caps, re-fueling valves, freight hold doors etc. are secured;

(c) Who, in the absence of competent traffic staff, is responsible for supervising the loading of the aircraft;

(d) The duties of special personnel such as car marshallers and animal attendants;

(e) The responsibility, when an APU is ground running and passengers are on board the aircraft, or are in the process of embarking or disembarking, for ensuring that there are satisfactory arrangements for cabin crew to be warned immediately of any APU emergency condition which might require the rapid evacuation of passengers from the aircraft;

(f) The responsibility for taking precautions for the safety of passengers when they are permitted to embark, disembark or to remain on board during fueling operations. There should be a nominated qualified person in attendance who shall be ready to initiate and direct an evacuation of the aircraft by the most practical and expeditious means available. Two-way communications shall be maintained by the aircraft's intercommunication system or other suitable means between the ground crew and supervising and qualified personnel on board the aircraft;

(g) The responsibility for ensuring correct completion of the Technical Log, day to day servicing and any pre-flight maintenance checks, ground de-icing and anti-icing operational procedures and checks before flight or any other special pre-flight servicing, i.e. when a flight is to be planned or expected to operate in suspected or known ground icing conditions, the flight shall not commence unless the aircraft has been inspected for icing and, if necessary, has been given appropriate de/anti-icing

treatment. Accumulation of ice or other naturally occurring contaminants shall be removed so that the aircraft is kept in an airworthy condition prior to take-off; and

(h) Limitations on the extent to which pilots and flight engineers may be allowed to operate on more than one aircraft type or variant.

3.5 Special consideration should be given to instructions on the arrangement of flight deck duties between the members of the flight crew, succession of command, and the procedures for double checking altimeter settings, and the selection and identification of radio aids. The risk of confusion or a serious oversight can be eliminated only if suitable routine procedures are laid down and meticulously observed both in training and in the course of normal operations. Operators are therefore required to specify such procedures in detail, with particular reference to the division of duties during take-off, en-route and in the execution of an instrument approach procedure and "go around" in IMC, and to give them special emphasis in all training and periodical tests. The procedure for instrument approach in IMC in multi-crew aircraft should relieve the pilot-in-command of as much of the workload as possible, and through a proper division of duties and monitoring functions throughout the descent, provide adequate safeguards against error or omission. The difficulty of transition from instruments in poor visibility should be taken fully into account, together with the need for a clear and systematic procedure for initiating "go-around" if there is any doubt about the advisability of continuing the approach by visual reference to the ground.

3.6 The division of duties between members of the crew in normal and emergency situations have to be promulgated. The division of duties between crew members in an emergency evacuation is discussed in paragraph 14 of this Chapter.

4 FATIGUE MANAGEMENT OF CREW

4.1 The operator shall establish flight time, flight duty period, duty period and rest period limitations that are within the prescriptive fatigue management regulations established by the Authority.

4.2 The detail of prescriptive fatigue management regulations in paragraph 4.1 can be referred to Appendix C: Flight Time and Flight Duty Period Limitation Requirements.

4.3 The extent to which a pilot-in-command is authorised in abnormal circumstances to exceed the operator's limitations on flight duty periods must be clearly defined in the manual. Instructions on this point should be as clear and concise as possible, so that pilots-in-command can readily determine the extent of their discretionary powers.

4.4 Instructions must include filing of reports by pilots-in-command or any crew members each time they exercise the discretion conferred upon them by the operator.

4.5 Instructions must be issued to crew covering abstention from alcoholic drinks for a suitable period prior to flight. The minimum acceptable period will be 8 hours. Crew must also be advised of the precautions to be taken if they are undergoing medication.

4.6 Responsibility within an operator's organisation for issuing instructions and making decisions on questions of flight, duty and rest periods and for processing discretion reports must be clearly defined and assigned to a member of the executive staff. The name of the person concerned, or the title of the office that he holds, must be included in the operations manual.

4.7 The operator is required to maintain and provide readily interpreted records of flight time, flight duty periods, duty periods and rest period of flight and cabin crew members. It follows that there must be suitable arrangements for collecting the information necessary to compile the records. Accurate records are essential to persons responsible for the rostering of aircraft crew.

5 TECHNICAL PARTICULARS OF AIRCRAFT

5.1 The operator shall provide, for each aircraft type operated, the "technical particulars of the aircraft" as part of the operational manual. The operator should take care to distinguish between specific information to be used in the course of flight operations and the more general basic information that a pilot might need to prepare for a technical type rating examination. If detailed descriptive matter is included as part of the manual, it should be in a separate volume. Information on the following matters, in particular, should be provided in a form suitable for use as an immediate reference in day-to-day operations:

(a) Action to be taken in the kind of technical emergency or fault that cannot be covered by a set drill of vital actions. Information should be provided about the effect on essential systems and services of serious faults such as the loss of generated electrical power. Information to be provided will vary with the type of aircraft and together with the emergency drills it should be in a readily identified section of the manual (e.g. on distinctively coloured pages);

(b) Procedure for pre-departure inspection as required by the maintenance schedule including a check of the fuel system for water content;

(c) Replenishment of the aircraft's fuel, oil, coolant, hydraulic fluid, de-icing and water methanol supplies to an approved specification. Checking of accuracy of fuel uplift and total contents, particularly for operations in remote areas;

(d) Supervising refueling and the topping up of tyres, oleos, de-icing and hydraulic systems, including oxygen and air reservoirs. The refueling information must include any specific precautions called for by:

(i) The use of wide cut fuels; and

(ii) The "off aerodrome" situation where either a fueling vehicle or a barreled supply is used.

(e) Calculation of critical airspeeds and Mach numbers, variable thrust, and tail plane settings;

(f) Maker's and/or operator's limitations affecting the handling of engines and pressurisation systems;

(g) Procedure and precautions to be observed in order to jettison fuel;

(h) Compliance with any special handling instructions; and

(i) Procedure and precautions to be observed in response to ACAS, GPWS and wind shear alerts and warnings.

5.2 With regard to aircraft performance, in addition to complying with the requirements in paragraph 29, operators should normally provide their Pilots-in-Command with information and simplified data from which they can readily determine without reference to a Flight Manual or Performance Schedule the maximum weight at which they may take-off or land on a particular flight. The maximum weight referred to is that resulting from the statutory weight and performance requirements, or limitations such as zero fuel weight contained in the Flight Manual. In many cases (on regular or scheduled operations) it would only be necessary to indicate that there was no restriction under the performance requirements; in others it might be necessary to indicate which of the requirements is critical and to provide a tabular or other clear presentation of limiting weights in varying environmental conditions such as wind and temperature. There would also be instances in which it would be both practicable and desirable for the operator to indicate any special flight procedures - such as minimum height for setting course in IMC or emergency turn after take-off in the event of engine failure - essential to secure compliance with the performance requirements in relation to the obstacle clearance data provided in the service providers accepted by the authority e.g. Aerads, Jeppesen or any other charts approved by the Authority or by the State of the Aerodrome.

Note: *As standard instrument departure (SID) routes do not guarantee adequate terrain clearance for all aircraft in the engine out case, the operator shall have checked that the performance requirements are met for all SIDs used by the company aircraft. Similarly, any emergency turn after take-off onto routes contained in the aircraft's operations manual, and approved for use by the local air traffic control, must also have been checked for compliance with the performance requirements.*

5.3 Information should also be given on the following points:

5.3.1 Landing or take-off on runways affected by water, snow, slush or ice, with particular reference to techniques, the additional distances required and the crosswind limitations;

5.3.2 Allowances to be made for the effect of varying surface conditions where grass strips are used;

5.3.3 Crosswind limits for take-off and landing. It is not sufficient to repeat a statement in a flight manual that a particular crosswind component has been found to be acceptable; operators' limitations should be stated in unequivocal terms. In gusty conditions, the limit shall apply to the mean of the reported steady wind and reported gusts. Limits in excess of any figure mentioned in the flight manual will not be acceptable. Lower limits must be stated for use on a contaminated runway and where appropriate for landing with control, steering, or retarding systems not fully serviceable or following an engine failure;

5.3.4 Minimum strip widths to be available after the clearance of snow, together with the maximum height of associated snow banks;

5.3.5 For light aircraft, maximum permissible wind velocities for taxiing, take-off and landing;

5.3.6 Allowances to be made for the effect of unserviceable devices such as flaps, reversers, air brakes, etc;

5.3.7 Drift-down procedures to be followed on specific routes after failure of an engine, if the aircraft's stabilising altitude is likely to be critical in terms of safety height: further guidance on the subject is stated in paragraph 29.11 of this chapter;

5.3.8 Special handling techniques and/ or routing procedures resulting from noise abatement regulations related to particular airfield and runways. The noise abatement procedures specified for any one aeroplane type should be the same for all aerodrome, unless otherwise approved by the Authority.

5.3.8.1 Noise Abatement Procedures

(a) Noise abatement regulations frequently require special handling techniques and routings after take-off. The flight manuals of the more recently certificated aeroplanes contain performance data related to noise abatement procedures. Details of the procedures for each airfield or runway used by the operator, for which noise abatement regulations exist, should be provided in the operations manual. Instructions to ignore noise abatement procedures in emergency situations should also be included; and

(b) Where, in exceptional circumstances, it may be appropriate in the course of noise abatement procedures to start a turn at less than 500 ft. AGL, pilots should be given suitable instructions about restricting the angle of bank. Pilots should also be instructed not to reduce thrust below 500 ft. AGL. Above 500 ft. AGL thrust should be reduced in accordance with the aircraft manufacturers instructions. In the absence of such guidance, thrust should not be reduced to an extent that would result in a gross gradient of climb of less than 4%.

5.3.9 Instructions on the conditions under which ferry flights with one engine inoperative can be undertaken, with details of the procedures to be followed;

Note: *In respect of any operating conditions for which no relevant data is provided in the flight manual or performance schedule, it is more important that the operator seeks information and approval of the data to be used from the Authority.*

5.4 A statement should be included in the manual to the effect that simulated instrument flight, and the simulation of emergency situations which might affect the flight characteristics of the aircraft, are prohibited on passenger or cargo carrying flights.

5.5 Aircraft instruments, equipment and flight documents, communication and navigation equipment as specified in the Authority Announcement shall be included.

6. FUEL FORMULA AND MANAGEMENT

6.1 Aeroplanes - Fuel Planning

6.1.1 A flight shall not commence unless the usable fuel on board meets all the requirements in 6.2.1 (a), (b), (c), (d), (e) and (f), if required and shall not continue from the point of in-flight re-planning unless the usable fuel on board meets the requirements in 6.2.1 (b), (c), (d), (e), and (f), if required.

6.1.2 To ensure departure with sufficient fuel for the flight and adequate reserves, the Standard Fuel Formula in paragraph 6.2 must normally be followed. In special circumstances and under certain conditions alternate formula may be used as detailed in paragraph 6.3, (Planning on an Alternative Destination with Re-Planning in Flight), and paragraph 6.4 (Isolated Aerodrome) of this chapter. Variation to pre-flight fuel calculations may be granted by the Authority in accordance with paragraph 6.5 of this chapter.

6.1.3 Whichever formula is used, allowance should be made for, as appropriate:

(a) Auxiliary power unit;

(b) Operation of systems such as de-icing which affect fuel consumption;

(c) A congested air traffic area where delays are likely;

(d) Airfield where there is a need to climb to or descend from the en-route safety altitude whilst in the vicinity of the airfield; and

(e) Accuracy of the aircraft fuel gauges.

6.1.4 The amount of usable fuel to be carried shall, as a minimum, be based on:

(a) The following data:

(i) Current aeroplane-specific data derived from a fuel consumption monitoring system, if available; or

(ii) If current aeroplane-specific data are not available, data provided by the aeroplane manufacturer; and

(b) The operating conditions for the planned flight including:

(i) Anticipated aeroplane mass;

(ii) Notices to Airmen;

(iii) Current meteorological reports or a combination of current reports and forecasts;

(iv) Air traffic services procedures, restrictions and anticipated delays; and

(v) The effects of deferred maintenance items and/or configuration deviations.

6.1.5 There should be instructions and guidance on the effect on fuel consumption of engine or system failure.

6.1.6 Where necessary, requirements for oil, water methanol, etc. as well as fuel should be specified.

6.1.7 Pilots-in-Command must be allowed to carry more than the minimum fuel at their discretion.

6.2 Standard Fuel Formula

6.2.1 The pre-flight calculation of usable fuel required shall include:

(a) Start-up and taxi fuel which shall be the amount of fuel expected to be consumed before take-off taking into account local conditions at the departure aerodrome and auxiliary power unit (APU) fuel consumption, and may be expressed in standard fixed amount;

(b) Trip fuel, which shall be the fuel to destination comprising fuel to enable the aircraft to take-off, climb, cruise, descent, approach and land at the destination aerodrome taking into account the operating conditions of 6.1.4 (b);

(c) Contingency fuel, which shall be the amount of fuel required to compensate for unforeseen factors. It shall be 5 percent (or not less than conditions of 3 percent refer to Doc 9976) of the planned trip fuel or of the fuel required from the point of re-planning but in any case, shall not be lower than the amount required to fly for five minutes at holding speed at 450 m (1500 ft) above the destination aerodrome in standard conditions;

Note: *Unforeseen factors are those which could have an influence on the fuel consumption to the destination aerodrome, such as deviations of an individual aeroplane from the expected fuel consumption data, deviations from forecast meteorological conditions, extended taxi times before take-off, and deviations from planned routings and/or cruising levels.*

(d) Destination alternate fuel which shall be:

(i) Where a destination alternate aerodrome is required, the amount of fuel required to enable the aeroplane to:

(1) Perform a missed approach at the destination aerodrome;

(2) Climb to the expected cruising altitude;

(3) Fly the expected routing to the destination alternate airport;

(4) Descend to the point where the expected approach is initiated; and

(5) Conduct the approach and landing at the destination alternate aerodrome; or

(ii) Where two destination alternate aerodromes are required, the amount of fuel, as calculated in paragraph 6.2.1 (d)(i), required to enable the aeroplane to proceed to the destination alternate aerodrome which requires the greater amount of the alternate fuel; or

(iii) Where a flight is operated without a destination alternate aerodrome, the amount of fuel required to enable the aeroplane to fly for 15 minutes at holding speed at 450 m (1500 ft) above destination aerodrome elevation in standard conditions;

(e) Final reserve fuel, which shall be the amount of fuel calculated using the estimated mass on arrival at the destination alternate aerodrome or the destination aerodrome when no destination alternate is required:

(i) For a reciprocating engine aeroplane, the amount of fuel required to fly for 45 minutes, under the appropriate speed and altitude; or

(ii) For a turbine engine aeroplane, the amount of fuel required to fly for 30 minutes at holding speed at 450 m (1500 ft) above aerodrome elevation in standard conditions.

(f) Additional fuel, which shall be the supplementary amount of fuel if the minimum fuel calculated in accordance with (b), (c), (d), and (e) is not sufficient to:

(i) Allow the aeroplane to descend as necessary and proceed to an alternate aerodrome in the event of engine failure or loss of pressurisation, whichever requires the greater amount of fuel based on the assumption that such a failure occurs at the most critical point along the route;

(1) Fly for 15 minutes at holding speed at 450 m (1500 ft) above aerodrome elevation in standard conditions; and

(2) Make an approach and landing;

(ii) Allow an aeroplane engaged in EDTO to comply with the EDTO critical fuel scenario as established by the Authority; and

(iii) Meet any other situations that may require additional fuel.

(g) The Pilot-in-Command may determine the discretionary fuel, which shall be the extra amount of fuel to be carried onboard.

Note 1: *Fuel planning for a failure that occurs at the most critical point along a route (6.2.1(f)(ii)) may place the aeroplane in a fuel emergency situation based on 6.5.1.*

Note 2: *To cater for very short sectors, and for alternates which are close to the destination, operators should specify a minimum contingency fuel and a minimum diversion fuel. For long haul operations and with Authority approval, the contingency fuel may be capped at a maximum value.*

Note 3: *Operators should determine one final reserve fuel value for each aeroplane type and variant in their fleet rounded up to an easily recalled figure.*

6.3 Planning on an Alternative Destination with Re-Planning in Flight

6.3.1 For planning an alternate destination with re-dispatch in flight:

(a) The trip fuel in paragraph 6.2.1(b) shall comprise:

(i) Fuel from take-off including climb and cruise to the in-flight re-dispatch (re-planning) point; and

(ii) Fuel from the in-flight re-dispatch point to landing at the final destination.

(b) The contingency fuel in paragraph 6.2.1(c) may be reduced to 5% of the planned fuel burn from the in-flight re-dispatch (re-planning) point to the final destination, but not below the operator's stated minimum contingency fuel.

6.3.2 the total fuel load calculated for paragraph 6.3.1 shall be increased if necessary, to not less than the fuel load needed for flight to the alternate destination, calculated in accordance with paragraph 6.2.

6.3.3 The alternative destination must be available for landing at the appropriate time, and its weather forecast must allow a technical stop to be made.

6.4 Isolated Aerodrome

6.4.1 Where because the destination is geographically isolated, there is no usable alternate aerodrome, items (d) and (e) of paragraph 6.2.1 may be replaced by a holding reserve related to statistical data on local weather conditions**.** The minimum acceptable will be:

(a) For a reciprocating engine aeroplane, the amount of fuel required to fly for 45 minutes plus 15 percent of the flight time planned to be spent at cruising level, including final reserve fuel, or two hours, whichever is less; or

(b) For a turbine engine aeroplane the amount of fuel required to fly for two hours at normal cruise consumption above the destination aerodrome, including final reserve fuel. Such aerodromes are to be listed in the operations manual.

6.5 Variation to Pre-flight Fuel Calculations

6.5.1 Notwithstanding the provisions in 6.2.1(a), (b), (c), (d), (e) and (f), the Authority may, based on the results of a specific safety risk assessment conducted by the operator which demonstrates how an equivalent level of safety will be maintained, approve variations to the pre-flight fuel calculation of taxi fuel (6.2.1(a)), trip fuel (6.2.1(b)), contingency fuel (6.2.1(c)), destination alternate fuel (6.2.1(d)), and additional fuel (6.2.1 (f)). The specific safety risk assessment shall include at least the:

(a) Flight fuel calculations;

(b) Capabilities of the operator to include:

(i) A data-driven method that includes a fuel consumption monitoring programme; and/or

(ii) The advanced use of alternate aerodromes; and

(c) Specific mitigation measures.

Note: *Guidance for the specific safety risk assessment, fuel consumption monitoring programmes and the advanced use of alternate aerodromes can be found in the Flight Planning and Fuel Management Manual (Doc 9976).*

6.6 Aeroplanes - In Flight Fuel Management

6.6.1 An operator shall establish policies and procedures, approved by the Authority, to ensure that in-flight fuel checks and fuel management are performed.

6.6.2 Crew must be given suitable instructions on monitoring of fuel used and ensuring fuel remaining on board is not less than the fuel required to proceed to an aerodrome where a safe landing can be made with the planned final reserve fuel remaining upon landing. The records required by these instructions should be retained for at least three months.

6.6.3 When an aircraft has been dispatched under paragraph 6.4 a decision must be made at or before decision point whether to land at the alternate destination or re-planning to the final destination. The manual must contain instructions that the aircraft may only be re-planning if the fuel on board is sufficient to reach the final destination (6.2.1(b)) with contingency fuel (6.2.1(c)), destination alternate fuel (6.2.1(d)), and final reserve fuel (6.2.1(e)) as per paragraph 6.2 calculation, or fuel sufficient to reach the final destination (6.2.1(b)) and contingency fuel (6.2.1(c)) with reserves of paragraph 6.3.1 if all the conditions of paragraph 6.3.2 are met.

6.6.4 The manual must state that in the event of a diversion, the fuel on-board shall be sufficient for the aircraft to arrive at the alternate with at least final reserve fuel (6.2.1(e)) upon landing.

6.6.5 When any abnormal fuel procedure is used in flight, the pilot-in-command must be informed and at least two crew members must monitor the operation.

6.6.6 Instructions may be included in the manual to allow crew to continue a flight to a destination when normal reserve fuel will no longer be available. Safeguarding conditions associated with those instructions shall include:

(a) Such a decision to continue should only be made when one hour or less from the destination and when close to a usable en-route aerodrome;

(b) The usable fuel remaining must be sufficient to fly to the destination aerodrome, make an approach with at least final reserve fuel (6.2.1(e)) upon landing;

(c) The actual and forecast meteorological conditions at the destination shall permit a visual approach to landing until one hour after ETA. Account of any significant crosswind on the runway should also be considered;

(d) There are no known or probable ATC delays for the period from ETA to ETA plus one hour; and

(e) There are at least two separate runways available and suitable for landing.

6.6.7 The pilot-in-command shall request delay information from ATC when unanticipated circumstances may result in landing at the destination aerodrome with less than the final reserve fuel plus any fuel required to proceed to an alternate aerodrome or the fuel required to operate to an isolated aerodrome.

6.6.8 The pilot-in-Command shall advise ATC of a minimum fuel state by declaring MINIMUM FUEL when, having committed to land at a specific aerodrome, the pilot calculates that any change to the existing clearance to that aerodrome may result in landing with less than planned final reserve fuel.

Note 1: *The declaration of MINIMUM FUEL informs ATC that all planned aerodrome options have been reduced to a specific aerodrome of intended landing and*

any change to the existing clearance may result in landing with less than planned final reserve fuel. This is not an emergency situation but an indication that an emergency situation is possible should any additional delay occur.

Note 2: *Guidance on declaring minimum fuel can be found in the Flight Planning and Fuel Management Manual (Doc 9976).*

6.6.9 The pilot-in-command shall declare a situation of fuel emergency by broadcasting MAYDAY MAYDAY MAYDAY FUEL, when the calculated usable fuel predicted to be available upon landing at the nearest aerodrome where a safe landing can be made is less than the planned final reserve fuel.

Note 1: *The planned final reserve fuel refers to the value calculated in 6.2.1(e)(i) or (ii) and is the minimum amount of fuel required upon landing at any aerodrome.*

Note 2: *The words "MAYDAY FUEL" describe the nature of the distress conditions as required in Annex 10, Volume II, 5.3.2.1, b)3.*

Note 3: *Guidance on procedures for in-flight fuel management can be found in the Flight Planning and Fuel Management Manual (Doc 9976)*

6.7 Fuel and oil records

6.7.1 The operator shall maintain fuel records to enable the Authority to ascertain that, for each flight, the requirements of paragraph 6.1 to 6.6 have been complied with.

6.7.2 The operator shall maintain oil records to enable the Authority to ascertain that trends for oil consumption are such that an aeroplane has sufficient oil to complete each flight.

6.7.3 Fuel and oil records shall be retained by the operator for a period of three months.

7 OXYGEN SUPPLY AND USE OF OXYGEN

7.1 Oxygen supply

Note: *Approximate altitudes in the Standard Atmosphere corresponding to the values of absolute pressure used in the text are as follows:*

Absolute pressure	*Metres*	*Feet*
700 hPa	*3 000*	*10 000*
620 hPa	*4 000*	*13 000*
376 hPa	*7 600*	*25 000*

7.1.1 A flight to be operated at flight altitudes at which the atmospheric pressure in personnel compartments will be less than 700 hPa shall not be commenced unless sufficient stored breathing oxygen is carried to supply:

(a) All crew members and 10 percent of the passengers for any period in excess of 30 minutes that the pressure in compartments occupied by them will be between 700 hPa and 620 hPa; and

(b) The crew and passengers for any period that the atmospheric pressure in compartments occupied by them will be less than 620 hPa.

7.1.2 A flight to be operated with a pressurized aeroplane shall not be commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all the crew members and passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurization, for any period that the atmospheric pressure in any compartment occupied by them would be less than 700 hPa. In addition, when an aeroplane is operated at flight altitudes at which the atmospheric pressure is less than 376 hPa, or which, if operated at flight altitudes at which the atmospheric pressure is more than 376 hPa and cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to 620 hPa, there shall be no less than a 10-percent supply for the occupants of the passenger compartment.

7.2 Use of oxygen

7.2.1 All flight crew members, when engaged in performing duties essential to the safe operation of an aeroplane in flight, shall use breathing oxygen continuously whenever the circumstances prevail for which its supply has been required in 7.1.1 or 7.1.2.

7.2.2 All flight crew members of pressurized aeroplanes operating above an altitude where the atmospheric pressure is less than 376 hPa shall have available at the flight duty station a quick-donning type of oxygen mask which will readily supply oxygen upon demand.

7.2.3 Cabin crew should be safeguarded so as to ensure reasonable probability of their retaining consciousness during any emergency descent which may be necessary in the event of loss of pressurization and, in addition, they should have such means of protection as will enable them to administer first aid to passengers during stabilized flight following the emergency. Passengers should be safeguarded by such devices or

operational procedures as will ensure reasonable probability of their surviving the effects of hypoxia in the event of loss of pressurization.

Note: *It is not envisaged that cabin crew will always be able to provide assistance to passengers during emergency descent procedures which may be required in the event of loss of pressurization.*

8 CHECKLISTS

8.1 The operator shall establish the use of checklists as an integral part of the organisation's standard operating procedures (SOPs). Flight crew and cabin crew shall be instructed on the use of these checklists. SOPs specify a sequence of tasks and actions to ensure that flight procedures can be carried out in a safe, efficient, logical and predictable manner. To achieve these objectives, SOPs should unambiguously express;

(a) What the task is;

(b) When the task is to be conducted (time and sequence);

(c) By whom the task is to be conducted;

(d) How the task is to be done (actions);

(e) What the sequence of actions consists of; and

(f) What type of feedback is to be provided as a result of the actions (verbal call-out, instrument indication, switch position, etc.)

Note: *Guidance material on crew briefing is available on ICAO Doc 8168 Volume 1 Part III Section 5 chapter 3, and GM for Standard Operating Procedures.*

8.2 The drills and checks to be followed in the operation of the aircraft, including those for non-normal or emergency conditions, should be listed in full in the manual - preferably in a separate volume. Emergency equipment checklists and instructions on their use should also be provided. The pilot-in-command shall ensure that the checklists are complied with. The design of the checklists shall observe human factors principles.

8.3 There should be items in the normal drill requiring the pilot-in-command to brief other flight crew members on the following matters:

8.3.1 Prior to take-off:

(a) The actions to be taken in the event of an emergency arising during or immediately after take-off;

(b) Any special requirements for take-off in crosswinds and on wet or otherwise contaminated runways;

(c) Noise abatement procedures;

(d) Selection of radio aids.

8.3.2 Prior to landing:

(a) Selection of radio aids;

(b) Missed approach procedures;

(c) Any special handling or systems requirements for landing;

(d) Selected alternate for diversion.

Note: *It is not suggested that these items should be included in checklists in detail; if suitable instructions are provided elsewhere, the word 'briefing' will be sufficient at the appropriate points in the lists.*

8.4 Checklists will not be acceptable unless they include detailed requirements for the setting and cross checking of altimeters for all phases of flight. There should also be an item in the normal drills requiring minimum safe altitudes to be checked before descending from cruising level.

8.5 Examples of emergency drills to be covered in checklists are:

(a) Engine failure;

(b) Engine fire and severe engine damage;

(c) Propeller malfunction;

(d) Failure of normal feathering system;

(e) Fuel filter icing;

(f) Relighting of turbine engines;

(g) Bus-bar and other serious electrical failures;

(h) Malfunction of power control systems;

(i) Pressurisation failure and emergency descent;

(j) Cabin/hold fire;

(k) Smoke removal;

(l) Essential actions prior to commencement of emergency evacuation;

(m) Hydraulic failures;

(n) Brake overheat.

8.6 In aircraft operated by two pilots, checklists should be stowed so that they are available to both pilots. If this is not possible, separate drill cards or checklists should be provided for each pilot for use on the flight deck. If the flight crew includes a flight engineer or third pilot a separate checklist should be provided for his/ her use. In "single pilot" aircraft, checklists should be supplemented by the placarding of vital actions for final approach and landing. Emergency drills should be clearly marked for immediate use and, on larger and more complex aircraft, they should preferably be given on a separate set of cards kept apart from other documents on the flight deck and immediately available. For cabin crew, details of their ditching, crash landing and emergency evacuation drills should be readily available in flight. This can be achieved either by issue to each member of the cabin crew of a copy of their emergency drills which they should be required to carry with them - or by stowing the drill cards at appropriate positions in the cabin. All checklists or drill cards must be of a quality sufficient to withstand heavy wear and to remain in legible condition.

8.7 On multi-crew aircraft, the manual should contain clear instructions that checklists are always to be used. On single pilot aircraft, the operator may at his discretion allow in-

flight drills to be carried out from memory. When an operator elects to adopt this procedure, he/ she must, nevertheless, ensure that the aircraft is provided with a checklist which is readily available to the pilot. Memorised drills must be carried out strictly in accordance with the checklist and emergency drills must be verified as soon as possible by reference to the checklist.

8.8 Aeroplane search procedure checklist

8.8.1 In order to save passengers, crew, ground personnel and the general public in all matters related to safeguarding against acts of unlawful interference with civil aviation., the operator shall ensure that aircraft security search and check have to be undertaken as required in National Civil Aviation Security Programme (NCASP) of the Kingdom of Thailand.

8.8.2 The operator shall ensure that all aeroplanes carry a checklist of the procedures to be followed for that aeroplane type in searching for concealed weapons, explosives, or other dangerous devices when a well- founded suspicion exists that the aeroplane may be the object of an act of unlawful interference. The operator shall also support the checklist with guidance on the appropriate course of action to be taken should a bomb or suspicious object be found and provide information on the least- risk bomb location specific to that aeroplane type. The requirement as well as the criteria of using the checklist has to be in line with the current revision of National Civil Aviation Security Programme (NCASP) of the Kingdom of Thailand.

8.9 Emergency response guidance for aircraft incidents involving dangerous goods

8.9.1 Operators hold dangerous goods specific approval shall ensure that for consignments for which a dangerous goods transport document is required by Technical Instruction (TI), appropriate information is immediately available at all times for use in emergency response to accidents and incidents involving dangerous goods in air transport. The information must be available to the Pilot-in-command and can be provided by:

(a) The ICAO document Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods (Doc 9481): or

(b) Any other document which provides appropriate information concerning the dangerous goods on board:

(c) Operators do not hold dangerous goods specific approval shall provide cabin crew provision of information for use in responding to dangerous goods incidents in flight.

8.9.2 Operators should provide a “dangerous goods emergency response kit” for use aboard an aircraft and training crew members regarding its use. A typical dangerous goods emergency response kit contains:

(a) Large, good quality polyethylene bags;

(b) Bag ties; and

(c) Long rubber gloves.

9 RADIO WATCH

9.1 The operator shall provide radio watch instructions to require a member of the flight crew to maintain a continuous watch on the emergency frequency 121.5 MHz and appropriate operational frequencies, to the extent possible.

10 ROUTE GUIDES

10.1 The route guide should be a volume or series of volumes separate from the rest of the operations manual. Aerad, Jeppesen or similar publications approved by the Authority will normally meet the requirement provided that flight crew are given adequate advice on the route to be followed. An operator providing his own guide should ensure that it meets the needs of crew in every respect. If flights are to be made only on airways or advisory routes (ADRs), it will be sufficient to include instructions to that effect; otherwise routes regularly flown should be specified in detail, normally on prepared navigation flight plans. For other flights, routes should be specified in a pilot-in-command's flight brief, a copy being retained at base. Operators are not required to lodge copies of standard of service providers accepted by the authority e.g. Aerad or Jeppesen flight guides with the Authority.

10.2 Particular care should be taken to ensure that adequate information is provided on; search and rescue facilities, obstructions in the approach pattern, radio failure procedures, prohibited and danger areas, standard TMA routings, seasonal meteorological conditions, ATC communications and navigational facilities and procedures associated with the route along the route(s) and applicable procedures over heavily populated areas and areas of high traffic intensity, obstructions, physical layout, lighting, approach aids and arrival, departure holding and instrument approach procedures, and applicable operating minima. Only recognised instrument approach or let-down procedures in general use should normally be included in the flight guide. Exceptionally, a special "break cloud" procedure devised by the operator may be considered acceptable provided it has been approved by the appropriate airport authority. Proposals to use such special procedures, accompanied by the associated aerodrome operating minima, should be submitted for approval to the Authority.

10.3 Normally, the cancellation of IFR flight plans at night or in congested terminal areas should be prohibited, and instructions to this effect included in the manual. If an operator does not wish to impose a total prohibition, detailed instructions should be included in the manual setting out the minimum conditions that must be satisfied before cancellation of an IFR flight plan.

10.4 In order to facilitate effective monitoring of an instrument approach by members of the flight crew, operators of multi-crew aircraft should provide for use on the flight deck at least two copies of the instrument approach chart to be used.

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11 METEOROLOGICAL AND VOLCANIC ACTIVITIES REPORTS FROM AIRCRAFT

11.1 The operator shall establish a policy and procedures for its flight crew to record and report meteorological observations and volcanic activity observed during flight.

11.2 Instructions on the reporting of meteorological observations and volcanic activities should be based on information and guidance provided in the AIP and/or in the publications issued by the foreign authorities responsible for the airspaces through which the flight is flown.

11.3 The operator shall require its flight crew to report special observations of the following conditions encountered or observed during climb out and approach:

(a) Moderate or severe turbulence; or

(b) Moderate or severe icing; or

(c) Severe mountain wave; or

(d) Thunderstorms, without hail, that are obscured, embedded, widespread or in squall lines; or

(e) Thunderstorms, with hail, that are obscured, embedded, widespread or in squall lines; or

(f) Heavy dust storm or heavy sandstorm; or

(g) Volcanic ash cloud; or

(h) Pre-eruption volcanic activity or a volcanic eruption.

Note: *Pre-eruption volcanic activity in this context means unusual and/or increasing volcanic activity which could presage a volcanic eruption.*

11.4 Special aircraft observations of pre-eruption volcanic activity, volcanic eruption or volcanic ash cloud shall be recorded on the special Air-Report of Volcanic Activity form. A copy of the form shall be delivered by the operator or the flight crew member, without delay, either personally or by email safetyreport@caat.or.th or https://caat.or.th/occurrence/

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12 MINIMUM SAFE ALTITUDES

12.1 The method for establishing the minimum flight altitudes shall be approved by the Authority.

12.2 The minimum safe altitude must be prescribed by the operator for each sector of each route to be flown including routes to "alternate" aerodromes. For this purpose, "sector" means the intended track from one reporting or turning point to the next, until the aircraft starts the instrument approach procedure (or joins the traffic pattern) at the aerodrome to be used for landing. Except as provided in paragraph below these figures must be specified by the operator prior to flight - in the appropriate volume of the manual, in a prepared navigational flight plan, or in the pilot-in-command's flight brief (details in Chapter 5 paragraphs 11 and 12).

12.3 To meet the needs of the pilot-in-command when he/she is obliged to depart from the planned or normal route, operators must include in the manual instructions from which the minimum flight altitude can readily be determined.

12.4 In specifying minimum flight altitude, operators must take account of any local regulations and limitations. Such minimum altitudes shall not be lower than any which may be applicable under the law of Thailand or of the countries whose territory is to be flown over. The instructions should include maintenance of altitude awareness and the use of automated or flight crew altitude or flight crew call-out; the use of auto-pilot and auto-throttles in IMC; the clarification and acceptance of ATC clearances, particularly where terrain clearance is involved. Operators must specify limitations on high rate of descent near the surface.

12.5 The criteria upon which minimum altitudes are based will necessarily be determined to some extent by the track guidance facilities available to the Pilot-in-Command, and by the extent to which Pilot-in-Command and operators are able in particular circumstances to accept the directions of radar controllers. The minimum acceptable standards will normally be as follows

(a) For general application: 1,500 feet above the highest terrain or obstacle within 20 NM. of the intended track, with additional provision where necessary for terrain or obstacles within 10 degrees of intended track from the last known position.

(b) For flight in controlled airspace where the track is well defined by two separate aids: 1,500 feet above the highest terrain or obstacle within 10 NM. of the intended track.

(c) For radar controlled flight within 25 NM. of the aerodrome of departure or intended landing: 1,000 feet above the highest terrain or obstacle within 5 NM. of the intended track. Pilots-in-Command should be instructed to monitor all radar instructions by reference to other aids and be reminded that radar control does not relieve them of their responsibility to ensure adequate terrain clearance.

(d) If the specified minimum altitude for a sector is related only to terrain or obstacles within less than 20 NM. of the intended track, special attention must be drawn to the fact in manuals and prepared navigational flight plans supplied to flight crew.

(e) For flights within 20 NM. of terrain having an elevation exceeding 2,000 feet, operations manuals should provide for minimum altitude to be increased by at least the following amounts according to the wind speed at flight level.

Wind speed in knots

Elevation of terrain	*0-30*	*31-50*	*51-70*	*Over 70*
2,000 - 8,000 ft	*500 ft*	*1,000 ft*	*1,500 ft*	*2,000 ft*
Above 8,000 ft	*1,000 ft*	*1,500 ft*	*2,000 ft*	*2,500 ft*

12.6 The manual should also include a reference to the effect of mountain waves and instruct pilots-in-command to take suitable precautions when such conditions are reported or forecast.

12.7 Minimum altitude should be related where necessary to the ability of the aircraft to comply with the Weight and Performance requirements. i.e. all engines operating, single engine failure for 2 engines aircraft, 1 or 2 engine failures for 3 or 4 engines aircraft.

12.8 If an operator wishes to use the minimum safe altitudes provided in a recognised Flight Guide (Aerads, Jeppesen or any charts that are approved by the Authority) he/she must first check that the basis of the publisher's calculations will give at least an equal standard to that required by the above paragraphs. It may be necessary to promulgate a correction in the manual so that the required standard is achieved.

13 AERODROME OPERATING MINIMA

13.1 It is operator requirement to establish aerodrome operating minima for each aerodrome to be used in operation.

13.2 The operator shall establish and document in the Operations Manual aerodrome operating minima for each aerodrome to be used in operations using the Authority approved method of determination of such minima. When specifying the Aerodrome Operating Minima, the operator shall not specify values lower than the appropriate values as specified by the State of aerodrome, except when specifically approved by that State. Operational credit(s) for aeroplanes equipped with automatic landing systems, HUD or equivalent displays, EVS, SVS or CVS shall be authorized by the authority. Where the operational credit relates to low visibility operations, the operator shall obtain a specific approval from the authority. Such shall not affect the classification of the instrument approach procedure.

To obtain a specific approval for the operational credit, the operators shall demonstrate to the CAAT that:

(a) the aeroplane meets the appropriate airworthiness certification requirements;

(b) the information necessary to support effective crew tasks for the operation is appropriately available to pilots;

(c) the operator has carried out a safety risk assessment of the operations supported by the equipment;

(d) the operator has established and documented normal and abnormal procedures and MEL;

(e) the operator has established a training programme for the flight crew members and relevant personnel involved in the flight preparation;

(f) the operator has established a system for data collection, evaluation and trend monitoring for low visibility operations for which there is an operational credit; and

(g) the operator has instituted appropriate procedures in respect of continuing airworthiness (maintenance and repair) practices and programmes.

Note:1 *The safety risk assessment shall be conducted in accordance with the guideline in CAAT GM for Safety Management System.*

Note:2 *CAAT GM for All Weather Operations (AWO), FAA AC 120-118 or AMC and GM to Part SPA to Commission Regulation (EU) No 965/2012 may be used as a guidance for operational credits specific approval.*

13.3 In establishing the aerodrome operating minima which will apply to any particular operation, the operator shall take into full account the following:

(a) The type, performance and handling characteristics of the aeroplane and any conditions or limitations stated in the flight manual;

(b) The composition of the flight crew, their experience and competence;

(c) The dimension and characteristic of the runway which may be selected for use;

(d) The adequacy and performance of available visual and non-visual ground aids;

(e) The equipment available on the aeroplane for the purpose of navigation and/or control of flight path during the approach to landing and the missed approach;

(f) The obstacle in the approach and missed approach areas and the obstacle altitude/height for the instrument approach procedures;

(g) The means used to determine and report meteorological conditions; and

(h) The obstacles in the climb-out areas and necessary clearance margin.

(i) The conditions prescribed in the operations specifications; and

(j) Any minima that may be promulgated by the state of the aerodrome.

Note: *Guidance on the establishment of aerodrome operating minima is contained in the Manual of All-Weather Operations (Doc 9365) and Guidance Material for "All Weather Operations"*

13.4 Instrument approach operations shall be classified based on the designed lowest operating minima below which an approach operation shall only be continued with the required visual reference as follows:

(a) Type A: a minimum descent height or decision height above 75 m (250 ft); and

(b) Type B: a decision height below 75 m (250 ft). Type B instrument approach operations are categorized as

(i) Category I (CAT I): a decision height not lower than 60 m (200 ft) and with either a visibility not less than 800 m or a runway visual range not less than 550 m;

(ii) Category II (CAT II): a decision height lower than 60 m (200 ft), but not lower than 30 m (100 ft) and a runway visual range not less than 300 m; and

(iii) Category III (CAT III) a decision height lower than 30 m (100 ft) or no decision height and a runway visual range less than 300 m or no runway visual range limitations

Note 1: *Where decision height (DH) and runway visual range (RVR) fall into different categories of operation, the instrument approach operation would be conducted in accordance with the requirements of the most demanding category (e.g. an operation with a DH in the range of CAT III but with an RVR in the range of CAT II would be considered a CAT III operation or an operation with a DH in the range of CAT II but with an RVR in the range of CAT I would be considered a CAT II operation). This does not apply if the RVR and/or DH has been approved as operational credits.*

Note 2: *The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path, In the case of circling approach operation the required visual reference is the runway environment.*

Note 3: *Guidance on approach classification as it relates to instrument approach operations, procedures, runways and navigation systems are contained in the All-Weather Operations Manual (Doc 9365)*

13.5 An instrument approach operation should not be authorised, when the aerodrome operating minima is below 800 m visibility unless RVR information is provided.

13.6 The operator shall not conduct instrument approach operations in low visibility which shall only be conducted when RVR information is provided unless specific approval by the Authority is obtained.

13.7 For take-off in low visibility, the operator shall obtain specific approval for the minimum take-off RVR from the Authority.

13.8 The operating minima for 2D instrument approach operations using instrument approach procedures shall be determined by establishing a minimum descent altitude (MDA) or minimum descent height (MDH), minimum visibility and, cloud conditions.

Note: *For guidance on applying a continuous descent final approach flight technique on non-precision approach procedures, refer to PANS-OPS (Doc 8168) Volume I, Section 1.7.*

13.9 The operating minima for 3D instrument approach operations using instrument approach procedures shall be determined by establishing a decision altitude (DA) or decision height (DH) and the minimum visibility or RVR.

13.10 Operations with lower visibilities than normally associated with the aerodrome operating minima may only be allowed on aircraft with HUD and/or EVS if approval has been obtained in accordance with paragraph 13.2

13.11 Threshold crossing height for 3D instrument approach operations

13.11.1 An operator shall establish operational procedures designed to ensure that an aeroplane being used to conduct 3D instrument approach operations crosses the threshold by a safe margin, with the aeroplane in the landing configuration and attitude.

13.12 The Operations Manual instructions must comply with the relevant regulations and any mandatory operating minima which foreign countries may apply or authorise.

13.13 A flight shall not be continued towards the aerodrome of intended landing, unless the latest available information indicates that at the expected time of arrival, a landing can be effected at the aerodrome or at least one destination alternate aerodrome, in compliance with the operating minima established in accordance with paragraph 13.1.

13.14 Minima and associated instructions must be related as necessary to particular types of aircraft and must be tabulated or otherwise presented in a manner that will facilitate immediate reference on the flight deck.

13.15 Runways (or landing strips) and approach aids which are not to be used (e.g. because the runway is too short) must be clearly indicated. This may be done in the operator's weather minima tables or by a general instruction prohibiting the use of runways or aids which are not included in the tables.

13.16 For guidance of pilots-in-command who may be obliged in exceptional circumstances to land at aerodrome for which values have not been specified, operators should include in the Operations Manual the data and instructions by means of which minima appropriate to the circumstances can readily be calculated. The guidance given should be sufficient to enable the pilot-in-command to determine all the values that would normally have been specified by the operator including, in particular, the minima appropriate to visual maneuvering for landing. When a pilot-in-command calculates the

Aerodrome Operating Minima (AOM) in accordance with these criteria the calculations should be retained with other flight documentation.

13.17 Operations with lower visibilities than normally associated with the aerodrome operating minima may only be allowed on aircraft with HUD and/or EVS if approval has been obtained in accordance with paragraph 13.28.

13.18 Selection of Alternate Aerodrome

An operator shall establish procedures in the Operations Manual or in the flight brief for the pilot-in-command for the selection of destination and/or alternate aerodromes in accordance with 13.18.2 when planning a flight.

13.18.1 Take-off Alternate Aerodrome:

An operator shall select and specify a take-off alternate aerodrome in the operational flight plan if either the meteorological conditions at the aerodrome of departure are below the operator's established aerodrome landing minima for that operation or if it would not be possible to return to the aerodrome of departure for other reasons.

The take-off alternate aerodrome shall be located within the following flight time distance from the aerodrome of departure:

(a) For aeroplanes with two engines, one hour of flight time at a one-engine in operative cruising speed, determined from the aircraft operating manual, calculated in ISA and still-air conditions using the actual take-off mass; or

(b) For aeroplanes with three or more engines, two hours of flight time at an all engine operating cruising speed, determined from the aircraft operating manual, calculated in ISA and still-air conditions using the actual take-off mass; or

(c) For aeroplanes engaged in Extended Diversion Time Operations (EDTO) where an alternate aerodrome meeting the distance criteria of (a) or (b) is not available, the first available alternate aerodrome located within the distance of the operator's specified maximum diversion time considering the actual take-off mass.

For an aerodrome to be selected as a take-off alternate the available information shall indicate that, at the estimated time of use, the conditions will be at or above the operator's established aerodrome operating minima for that operation.

Operators using Category II or Category III equipped aircraft should, at the flight planning stage consider the possibility of equipment malfunction and ensure that the weather at the alternate aerodrome is Category I or better.

13.18.2 En-route alternate aerodrome

En-route alternate aerodromes required by paragraph 20 in this Chapter for extended diversion time operations by aeroplanes with two turbine engines, shall be selected and specified in the operational and air traffic services (ATS) flight plans.

13.18.3 Destination alternate aerodrome

For a flight to be conducted in accordance with the instrument flight rules, the operator shall select and specify at least one destination alternate aerodrome in the operational and ATS flight plans, unless:

(a) The duration of the flight from the departure aerodrome, or from the point of inflight re-planning to the destination aerodrome is such that, taking into account

all meteorological conditions and operational information relevant to the flight, at the estimated time of use, a certainty exists that:

(i) The approach and landing may be made under visual meteorological conditions; and

(ii) Separate runways are usable at the estimated time of use of the destination aerodrome with at least one runway having an operational flight instrument approach procedure; or

(b) The aerodrome is isolated. Operations into isolated aerodromes do not require the selection of a destination alternate aerodrome(s) and shall be planned in accordance with paragraph 6.5 in this chapter, plus contingency fuel of 5%.

(i) For each flight into an isolated aerodrome a point of no return shall be determined; and

(ii) A flight to be conducted to an isolated aerodrome shall not be continued past the point of no return unless a current assessment of meteorological conditions, traffic, and other operational conditions indicate that a safe landing can be made at the estimated time of use.

Note 1: *Separate runways are two or more runways at the same aerodrome configured such that if one runway is closed, operations to the other runway(s) can be conducted.*

Note 2: *Guidance on planning operations to isolated aerodromes can be found in the Flight Planning and Fuel Management Manual (Doc 9976).*

13.18.4 The operator shall select and specify two destination alternate aerodromes in the operational and ATS flight plans when, for the destination aerodrome:

(a) Meteorological conditions at the estimated time of use will be below the operator's established aerodrome operating minima for that operation; or

(b) Meteorological information is not available.

13.19 Notwithstanding the provisions in 13.18.1, 13.18.2, and 13.18.3; the Authority may, based on the results of a specific safety risk assessment conducted by the operator which demonstrates how an equivalent level of safety will be maintained, approve operational variations to alternate aerodrome selection criteria. The specific safety risk assessment shall include at least the:

(a) Capabilities of the operator;

(b) Overall capability of the aeroplane and its systems;

(c) Available aerodrome technologies, capabilities and infrastructure;

(d) Quality and reliability of meteorological information;

(e) Identified hazards and safety risks associated with each alternate aerodrome variation; and

(f) Specific mitigation measures.

Note: *Guidance on performing a safety risk assessment and on determining variations, including examples of variations, are contained in the Flight*

Planning and Fuel Management Manual (Doc 9976) and the Safety Management Manual (SMM) (Doc 9859).

13.20 Meteorological conditions

A flight to be conducted in accordance with VFR must not be commenced unless current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions along the route or that part of the route to be flown under VFR will, at the appropriate time, be such as to enable compliance with these rules.

13.20.1 A flight to be conducted in accordance with the instrument flight rules shall not:

(a) Take off from the departure aerodrome unless the meteorological conditions, at the time of use, are at or above the operator's established aerodrome operating minima for that operation; and

(b) Take off or continue beyond the point of in-flight re-planning unless at the aerodrome of intended landing or at each alternate aerodrome to be selected in compliance with paragraph 13.7 current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions will be, at the estimated time of use, at or above the operator's established aerodrome operating minima for that operations.

13.20.2 To ensure that an adequate margin of safety is observed in determining whether or not an approach and landing can be safely carried out at each alternate aerodrome, the operator shall specify appropriate incremental values for height of cloud base and visibility, acceptable to the Authority, to be added to the operator's established aerodrome operating minima.

Note: *Guidance on the selection of these incremental values can be found in the Flight Planning and Fuel Management (FPFM) Manual (Doc 9976).*

13.20.3 An acceptable time margin used by the Authority is one hour before and after earliest and latest time of arrival. This may be reduced in special circumstances, e.g. if the meteorological forecast is only valid for the time of operation of the aerodrome and does not cover the period before opening. A margin of time established by the operator for the estimated time of use of an aerodrome shall be Authorised by the Authority.

Note: *Guidance on establishing an appropriate margin of time for the estimated time of use of an aerodrome can be found in the Flight Planning and Fuel Management (FPFM) Manual (Doc 9976).*

13.21 Take-off Minima

Minima condition for take-off must be specified in terms of cloud ceiling and the runway visual range or visibility as appropriate. Full account should be taken of the factors in the GM for AWO in particular the nature and position of runway lights and/or markings, the take-off run and emergency distance available, runway width and the directional controllability of the aircraft particularly in case of engine failure.

13.22 Special Rules Applicable to Certain Types of Aircraft

Certain classes of aircraft which are less well equipped and/or have a limited engine-out performance capability will need to operate to higher weather minima. Such minima shall be submitted to the Authority for approval.

13.23 Landing Minima

Decision height/altitude (DH, DA) or minimum descent height/altitude (MDH, MDA) and Runway Visual Range (RVR) and/or visibility must be specified for each runway or landing strip and approach aid to be used. Crew must be instructed:

(a) Not to continue an approach below 300m (1000 ft) above the aerodrome elevation or into the final approach segment unless the reported or controlling RVR is at or above the specified value;

(b) If, after entering the final approach segment or after descending below 300m (1000 ft) above the aerodrome elevation the reported visibility or controlling RVR falls below the specified minimum, the approach may be continued to DA/H or MDA/H;

(c) To initiate a missed approach if the approach and landing from DH/DA or MDA/DH cannot be completed entirely by visual reference to the ground (see Note 2 in paragraph 13.4 of this Chapter); and

(d) That the procedure should ensure that the aircraft conducting a precision approach crosses the threshold by a safe margin in a landing configuration and attitude.

13.24 Aerodrome Operating Minima

In deciding the values to be specified, operators shall be guided by the factors in the appropriate guidance material i.e. GM for AWO. They must also take into account all the relevant limitations notified by the appropriate aerodrome authority. Any altimeter system, and the amount of sink following initiation of a missed approach must be allowed for. The minimum acceptable RVR is related to decision height and to visual approach and runway aids.

When specifying Aerodrome Operating Minima as required by the Authority Requirement, operators should not specify values of Runway Visual Range for Category I operations lower than the appropriate values. Operators may use either the services provider accepted by the authority e.g. Jeppesen, AERAD or any charts that are approved by the Authority. The minimums specified in these charts should not be lower than that specified by the respective states that they operate into The following is an example of the RVR related to decision height and approach lighting available for aeroplanes exceeding 5,700 kg MTOW

DH (feet)	High intensity approach lighting Length available (meters) Day/Night									Low intensity approach lighting available (meters)			
	Over 800	850 – 750	749 – 650	649 – 550	549 – 450	449 – 350	349 – 250	249 – 150	149 – 0	Day All lengths	Over 600	Night 599 - 300	299 - 0
200 - 212	600	600	700	700	800	800	900	1000	1100	1100	900	1000	1100
213 - 237	600	700	700	800	800	900	1000	1100	1200	1200	900	1100	1200
238 - 262	700	700	800	900	900	1000	1100	1200	1300	1300	1000	1200	1300
263 - 287	700	800	900	1000	1000	1100	1200	1300	1400	1400	1100	1300	1400
288 - 325	800	900	1000	1100	1100	1200	1300	1400	1500	1500	1200	1400	1500
326 - 375	900	1000	1100	1200	1200	1300	1400	1400	1500	1500	1200	1400	1500
376 - 425	1000	1100	1200	1300	1300	1400	1500	1500	1500	1500	1300	1500	1500
426 - 475	1100	1200	1300	1400	1400	1500	1500	1500	1500	1500	1400	1500	1500
476 - 525	1200	1300	1400	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
526 - 575	1300	1400	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
576 - 625	1400	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
626 or higher	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500

Figure 1 Aerodrome Operating Minima

13.24.1 Operators must specify increments to be applied to the normal specified values in the event of any unserviceability of engine, system or instrumentation which significantly affects the performance and/ or handling of the aircraft. Operators should also consider specifying increments to be applied by pilots- in- command with limited experience. All approaches should be conducted according to a stabilised approach procedure.

13.25 Minima for Visual Maneuvering for Landing

Minima for visual maneuvering for landing (circling minima) must be established by the operator for each aerodrome to be used. These minima shall consist of a minimum circling height and a minimum visibility. They would apply, for example, where a pilot used a radio aid to position him/herself in sight of the aerodrome and then made a partial circuit (or other significant maneuver) to line- up for the approach and landing.

13.25.1 The minimum height for circling should be determined by reference to the relevant chart or AIP and account must be taken of obstacles and terrain within the appropriate radius of the center of the aerodrome. The radius used must be indicated in the manual.

13.25.2 At some aerodromes, it will be necessary to restrict circling to a particular area of the circuit - e.g. “north of the extended centerline only”- because of major obstacles or high ground in the vicinity. Any such restriction must be clearly indicated in the lists of operating minima.

13.25.3 For a visual circuit of the aerodrome based on visual maneuvering minima, a pilot should have continuous sight of ground features which will enable him to establish the position of the aircraft in relation to the aerodrome and subsequently to remain within the notified visual maneuvering area.

13.26 In approving the operational use of automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, the operator shall provide evidence that:

(a) The equipment meets the appropriate airworthiness certification requirements;

(b) The operator has carried out a safety risk assessment of the operations supported by the automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS; and

(c) The operator has established and documented the procedures for the use of, and training requirements for, automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS.

13.27 Aerodromes without Approach Aids

As a general rule for public transport aircraft carrying passengers, flights to aerodrome without a radio or radar approach aid are prohibited. This should be brought especially to the attention of crew in operations manuals. In exceptional circumstances flights to such aerodromes may be specially permitted, and suitable aerodrome operating minima, together with associated operating procedures, will be agreed with the operator.

Note: *Material concerning the methods for determining aerodrome operating minima can be found in All Weather Operations Manual (Doc 9365).*

13.28 Instrument Flight Procedures

One or more instrument approach procedures designed to support instrument approach operations shall be approved and promulgated by the State in which the aerodrome is located to serve each instrument runway or aerodrome utilized for instrument flight operations.

13.28.1 All aeroplanes operated in accordance with instrument flight rules shall comply with the instrument flight procedures approved by the State in which the aerodrome is located.

Note 1: *See 13.4 for instrument approach operation classifications.*

Note 2: *Information for pilots on flight procedure parameters and operational procedures can be found in PANS-OPS (Doc 8168), Volume I. Criteria for the construction of instrument flight procedures for the guidance of procedure specialists can be found in PANS-OPS (Doc 8168), Volume II. Obstacle clearance criteria and procedures used in certain States may differ from PANS-OPS, and knowledge of these differences is important for safety reasons (see Chapter 5, 8.4).*

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14 EMERGENCY EVACUATION PROCEDURES

14.1 The manual should specify the procedures to be followed by the aircraft crew for the rapid evacuation of an aircraft, and the care of passengers, in the event of a forced landing, ditching or other emergency. Much of the material will necessarily be descriptive but it is essential that the basic drills to be followed by the various members of the aircraft crew should be summarised and tabulated. Particular attention should be paid to the following points:

(a) The correct setting for pressurisation controls - e.g. spill valves, safety valves, and discharge valves - prior to ditching;

(b) The proper use of emergency escape slide equipment;

(c) The method of fitting life-jackets to small children;

(d) The briefing of passengers and warning of impact;

(e) The seating of aircraft crew members adjacent to exits which drills require them to open;

(f) Crowd control (particularly in relation to aircraft capable of carrying large numbers of passengers) including procedures for initiating and maintaining the rapid egress of passengers in the event of an emergency evacuation; and

(g) The need to move passengers away from the vicinity of the aircraft after evacuation.

14.2 Clear instructions should be given in the manual (supplemented by simple diagrams) on the location and, where it is not self-evident, the method of use of each item of emergency and survival equipment such as escape chutes and ropes, exits, fire extinguishers, oxygen masks and smoke protection equipment, emergency lights, torches, first aid kits, life-saving rafts, life-jackets, survival packs, emergency radio, and flotation cots. It is especially important that differences between individual aircraft of the same type are clearly shown.

14.3 Special consideration should be given to the problems posed by the carriage of disabled passengers and the possible need to carry additional cabin crew. The Pilot-in-Command should be made aware of the presence of severely disabled persons on board, and of the precautions taken to minimise the effect of their carriage on the conduct of an emergency evacuation of the aircraft.

14.4 Operators should ensure that there are satisfactory arrangements for cabin crew to be warned immediately of any emergency which might require the rapid evacuation of passengers from the aircraft.

14.5 To improve the chances of a successful evacuation, operators should back up the cabin crew briefing by paying special attention to the individual passenger safety cards, required by the Authority Regulations. It should be in colour, and pictorial, giving simply and unambiguously:

(a) Instructions on the method of use of safety belts and harnesses;

(b) Instructions on the brace position to be adopted in the event of an emergency landing;

(c) Information as to where emergency exits are to be found and how to use them; and

(d) Information on where life-jackets, escape slides, life rafts, oxygen masks are to be found and how to use them.

15 ALLOWABLE DEFICIENCIES

15.1 The operator shall provide guidance to pilots-in-command on whether and on what conditions aircraft may be operated with defect not rectified. The minimum equipment list for all specific operations including any requirements relating to operations in All Weather Operations (CAT II and CAT III), RNP, RNAV, MNPS, RVSM, EDTO and CNS/ATM airspace and any other special operation requirements shall be submitted to the Authority for approval.

Note: *Further details and references on RNP/RNAV, MNPS and RVSM can be found in the following ICAO Document:*

(a) RNP/RNAV - ICAO Doc 9613 (PBN);

(b) MNPS - NATS MNPS (North Atlantic MNPS Airspace Operations Manual); and

(c) RVSM - ICAO Doc 9574.

15.2 When the carriage of unserviceable equipment results in a deviation from the normal drills, satisfactory alternative drills must be included in the manual. It is important, when items such as spoilers or thrust reversers are listed as allowable deficiencies that the operator not only publishes alternative drills, but also checks with the Authority on the validity of relevant performance data.

16 USE AND CHECKING OF ALTIMETERS

16.1 Operators should provide detailed instructions in their operations manuals about altimeter setting procedures and in particular, about their policy regarding the use of QFE and QNH.

16.2 The instructions should include pre-flight serviceability checks, the settings to be used on each altimeter for each phase of flight, and the monitoring and crosschecking duties of flight crew during climb and descent and whenever a setting is changed.

16.3 In order to facilitate effective monitoring during the approach and landing phase in aircraft operated by two pilots, the Authority requires that both pilots' altimeters be set to the same datum unless otherwise approved by the Authority.

16.4 Altimeters Procedure

16.4.1 This procedure is intended to assist the operator in preparing instructions relating to the proper use of all altimeters on the aircraft flight deck. It applies mainly to multicrew operations, but can, with few exceptions, be applied to single-pilot operations. It is for the operator to determine its own policy in using QNH or QFE for landing; this policy should be reflected in the instructions and procedures which should be clear, positive and consistent.

16.4.2 Instructions should cover all stages of the operation of the aircraft, both before and during flight. A company's basic policy should be accurately reflected in its check lists, and take account of the following:

(a) Pre-flight serviceability tests

(i). The settings to be made on each altimeter on the flight deck prior to take-off and at each stage of the flight.

(ii). During the approach phase a check of airfield height is required; a cross check of airfield height against the difference between the QFE and QNH settings should also be made when QFE is used for landing.

(b) Additional instructions should be included on the following (where appropriate to the basic policy):

(i). The procedure for indicating decision heights for landing; this might range from a figure in the navigation log to altimeter bugs and/or separate "landing data cards";

(ii). The settings and procedures to be adopted when QFE is not available or cannot for some reason be used by an aircraft when a company's normal policy is to use QFE;

(iii). The manner of checking and of the use of any non-pressure altimeter(s);

(iv). The provision of appropriate procedures if an altimeter becomes unserviceable in flight, and also the conditions to be met if this is a pre-flight allowable deficiency; and

(v). The manner of setting the altimeters, when the take-off or landing is carried out from the co-pilot's seat. Unless there are good reasons for doing otherwise, operators should not vary their normal policy.

Note: *Neither in the policy statement nor in the check lists is it sufficient for the word "set" to be used. The setting required by the operator should be clearly stated in respect of each altimeter concerned, including any "standby" altimeter.*

16.4.3 The following matters should also be covered in the operations manual:

(a) The calls to be made by the monitoring pilots during instrument approaches, e.g. at the outer marker and at 100 ft. above decision height or thereabouts. In the case of Category II and III weather minima approaches, the appropriate calls and responses will need to be stated in some detail;

(b) Correct reporting of height changes to ATC: it should be particularly noted that the report should not be made before arriving at or before leaving the particular altitude/level;

(c) Provision of one altimeter to be set to an appropriate QNH setting when flying at or near to the Minima Safe Altitude (particularly for unpressurised single crew aircraft) would be a prudent precaution;

(d) Cross checking of altimeters at appropriate intervals by all flight deck crew during climb and descent;

(e) Instructions requiring the Co-Pilot to advise the Pilot-in-Command that he/she is approaching the assigned altitude or level;

(f) An instruction requiring the crew to inform ATC, prior to commencement of a radar approach, of the intention to use QNH settings throughout the procedure; and

(g) Procedures for use of Altitude Alert Systems, if fitted.

17 REPORTING OF ACCIDENTS, INCIDENTS AND OCCURRENCES

17.1 Operators and Pilots-in-Command of Thai registered aircraft are required to report any accidents, incidents or occurrences which endangers, or unless corrected would have endangered the flight crew and passengers and aircraft. The list of reportable occurrences and the applicable reporting timelines are set out in The Civil Aviation Authority of Thailand Requirement No. 22/2562: "Reporting of Civil Aviation Occurrences". The manual should remind personnel of their responsibilities in this regard and state the company procedure for dealing with such reports.

17.2 Pilots-in-Command are to report any hazardous conditions, other than those associated with meteorological conditions, to the appropriate aeronautical station as soon as possible. The reports so rendered shall give such details as may be pertinent to the safety of other aircraft.

17.3 The Pilot-in-Command shall be responsible for reporting all known or suspected defect in the aircraft to the operator at the termination of the flight.

17.4 As of 4th November 2021, the pilot-in-command shall report the runway breaking action special air-report (AIREP) when the runway breaking action encountered is not as good as reported.

Note: *The Procedures for making special air-reports regarding runway breaking action can be found in the PANS-ATM (Doc 4444), Chapter 4 and Appendix I.*

18 DANGEROUS GOODS

18.1 The operations manual should indicate whether or not a specific approval for the carriage of dangerous goods is held and what conditions apply to that specific approval. Operators who carry dangerous goods should also include in their operations manual information regarding the means of identifying dangerous goods, their manner of loading and the responsibilities of crew members concerning such goods. The conditions for the carriage of dangerous goods are covered in Chapter 3, paragraph 3 of this document.

18.2 Operators who do not seek specific approval to carry dangerous goods must state the prohibition of dangerous goods carriage in the operations manual and give guidance to staff and agents concerning which goods may not be carried.

19 GROUND HANDLING[1] AND AIRCRAFT DISPATCH

19.1 Operators are responsible for the safe dispatch of their aircraft following cargo and passenger loading, refueling, cleaning, catering and the completion of pre-flight maintenance and servicing. Any damage to the aircraft must be reported and assessed for airworthiness significance prior to flight.

19.2 Instructions must be given to ensure that dispatch tasks are carried out in a standard manner, that each task is fully and correctly completed, and that any damage is reported immediately.

19.3 Instructions on training requirements, subcontracting policies, handling and loading/ unloading processes, SOP and practices for all ground handling operations should be developed in accordance with the IATA Ground Operations Manual and IATA Airport Handling Manual.

19.4 Where dispatch tasks and ground handling tasks are contracted out to other organisations, contracts must include the operator's requirements for safe conduct of the task and the performance of the contractor, in respect of safety, must be monitored regularly. Even when all or part of the functions and tasks have been contracted to contractor, operators' ground handling responsibility must be permanently maintained.

20 OPERATIONS BEYOND 60 MINUTES TO AN EN-ROUTE ALTERNATE AERODROME

20.1 All operators conducting operations beyond 60 minutes from a point on a route to an en-route alternate aerodrome shall ensure that:

(a) For all aeroplanes:

(i) En-route alternate aerodromes are identified; and

(ii) The most up-to-date information is provided to the flight crew on identified en-route alternate aerodromes, including operational status and meteorological conditions; and

(iii) The operation meets any other requirements that the Authority may stipulate from time to time.

(b) for aeroplanes with two turbine engines, the most up-to-date information provided to the flight crew indicates that conditions at identified en-route alternate aerodromes will be at or above the operator's established aerodrome operating minima for the operation at the estimated time of use.

20.2 In addition to 20.1, operators shall ensure that the following are taken into account and provide the overall level of safety acceptable to the Authority:

(a) Operational control and flight dispatch procedures;

(b) Operating procedures; and

(c) Training programmes

[1] *Ground handling includes services that are necessary for an aircraft's arrival at and departure from, an airport, other than air traffic services.*

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21 AEROPLANE OPERATING PROCEDURES FOR LANDING PERFORMANCE

21.1 As of 4th November 2021, an approach to land shall not be continued below 300 m (1000 ft) above aerodrome elevation unless the pilot-in-command is satisfied that, with the runway surface condition information available, the aeroplane performance information indicates that a safe landing can be made.

Note 1: *The procedures used by aerodromes to assess and report runway surface conditions can be found in the PANS-Aerodromes (Doc 9981) and those for using runway surface condition information on board aircraft can be found in the Aeroplane Performance Manual (Doc 10064).*

Note 2: *Guidance on development of aeroplane performance information can be found in the Aeroplane Performance Manual (Doc 10064).*

22 EXTENDED DIVERSION TIME OPERATIONS (EDTO)

22.1 Unless the Authority has issued a specific approval for EDTO, an aeroplane with two or more turbine engines shall not be operated on a route where the diversion time from any point on the route to an en-route alternate aerodrome exceeds threshold time of:

(a) 60 minutes for aeroplanes with two turbine engines; and

(b) 180 minutes for aeroplanes with more than two turbine engines

Note 1: *When the diversion time exceeds the threshold time, the operation is considered to be an extended diversion time operation (EDTO).*

Note 2: *For the purpose of EDTO, the take-off and/or destination aerodromes may be considered en-route alternate aerodromes.*

22.2 On issuing the specific approval for extended diversion time operations, the maximum diversion time granted to the operator for each particular aeroplane and engine combination shall be specified by the Authority.

22.3 An operator seeking maximum diversion time for a particular aeroplane type to engage in extended diversion time operations from the Authority, besides satisfying the requirements in paragraph 22.1, shall also ensure that:

(a) For all aeroplanes: the most limiting EDTO significant system time limitation, if any, indicated in the Aeroplane Flight Manual (directly or by reference) and relevant to that particular operation is not exceeded; and

(b) For aeroplanes with two turbine engines: the aeroplane is EDTO certified.

22.4 Notwithstanding the provisions in 22.3(a); the Authority may, based on the results of a specific safety risk assessment conducted by the operator which demonstrates how an equivalent level of safety will be maintained, approve operations beyond the time limits of the most time-limited system. The specific safety risk assessment shall include at least the:

(a) Capabilities of the operator;

(b) Overall reliability of the aeroplane;

(c) Reliability of each time limited system;

(d) Relevant information from the aeroplane manufacturer; and

(e) Specific mitigation measures.

22.5 For aeroplanes engaged in EDTO, the additional fuel required by 6.2.1 (f)(ii) shall include the fuel necessary to comply with the EDTO critical fuel scenario as established by the Authority.

22.6 A flight shall not proceed beyond the threshold time in accordance with paragraph 20.1 unless the identified en-route alternate aerodromes have been re-evaluated for availability and the most up to date information indicates that, during the estimated time of use, conditions at those aerodromes will be at or above the operator's established aerodrome operating minima for the operation. If any conditions are identified that would preclude a safe approach and landing at that aerodrome during the estimated time of use, an alternative course of action shall be determined.

22.7 An operator authorised to conduct operations where the specific diversion time is beyond the threshold time shall ensure that the following are taken into account in providing the overall level of safety intended by the provisions of Thailand Airworthiness Requirements:

(a) Reliability of the propulsion system;

(b) Airworthiness certification for EDTO of the aeroplane type; and

(c) EDTO maintenance programme.

Note 1: *EDTO may be referred to as ETOPS in some documents.*

Note 2: *Additional guidance is provided via Guidance Material for EDTO (GM for EDTO).*

Note 3: *Guidance on the level of performance and reliability of aeroplane systems as well as guidance on continuing airworthiness aspects can be found in the Airworthiness Manual (Doc 9760).*

22.8 Any ETOPS approval previously granted by the Authority will continue be valid unless varied, suspended, cancelled or revoked.

23 MIXED FLEET FLYING OPERATIONS (MFF)

DEFINITIONS

(a) Mixed Fleet Flying (MFF)

The operation of Primary MFF Aircraft and Secondary MFF Aircraft by a CAAT AOC holder.

(b) Primary MFF Aircraft

An Aircraft, or group of Aircrafts, designated by a CAAT AOC holder and used as a reference to compare differences with the Secondary MFF Aeroplane within the operator's fleet.

(c) Secondary MFF Aircraft

An Aircraft, or group of Aircrafts, of a different type or variant from the Primary MFF Aircraft.

(d) Variant

An Aircraft, or a group of Aircrafts, that has the same characteristics as the Primary MFF Aircraft but is different from the Primary MFF Aircraft such that additional flight crew knowledge, skills and/or abilities are required in order to operate it.

23.1 General

23.1.1 An operator who intends to commence Mixed Fleet Flying (MFF) operations shall apply for approval from the Authority. The Authority, when satisfied that the operator meets the requirements, may approve the MFF application with or without conditions imposed.

23.1.2 An application under paragraph 23.1.1 shall be accompanied by the following documents:

(a) Assessment by the manufacturer on the suitability of the Aircraft type(s) to be engaged in MFF;

(b) An MFF policy and supporting procedures; and

(c) An MFF Programme including the Aircraft type(s) to be used for the Primary and Secondary MFF Aircraft.

23.1.3 An operator who is approved to conduct MFF operations shall only use a Secondary MFF Aircraft that is approved by the Authority.

23.1.4 The operator shall conduct the MFF operations in accordance with the approval granted by the Authority.

23.1.5 The MFF Policy and Programme shall be documented in the Operations Manual and/or Training Manual.

23.2 Pre-Requisites for MFF Operation - Pilot Qualification

The operator shall ensure that each pilot:

(a) Has completed at least two consecutive Proficiency checks;

(b) Has at least 500 total flying hours in the relevant crew position; and

(c) Has at least 3 months and 150 flying hours' experience on the Primary MFF Aircraft, with the operator before he is inducted into the operator's MFF Programme.

23.3 MFF Programme

23.3.1 The operator's MFF Programme shall describe the process for qualifying a pilot to become an MFF pilot. It shall encompass the following:

(a) The necessary training to obtain an Aircraft type rating on Secondary MFF Aircraft;

(b) A Consolidation Period; and

(c) MFF Indoctrination Training.

Note: - *While undergoing the MFF Programme, the pilot may continue to engage in commercial air transport and is subject to the requirement in Chapter 4, paragraph 1.8.2.*

Consolidation Period

23.3.2 The operator shall ensure that the pilot accumulate sufficient operating experience on the Secondary MFF Aircraft during the Consolidation Period.

23.3.3 The Consolidation Period shall, at the minimum, take into consideration the following factors:

(a) The extent of differences between Primary MFF Aircraft and Secondary MFF Aircraft;

(b) Recommendations by the aircraft manufacturer(s); and (c) experience of the operator.

MFF Indoctrination Training

23.3.4 The MFF Indoctrination Training shall be designed to equip the pilot with the necessary knowledge on MFF operations. This training shall be conducted either by qualified personnel or by any other means acceptable to the Authority.

23.3.5 The operator shall ensure that the pilot complete his MFF Programme within 12 months of his last base check on the Primary MFF Aircraft.

23.4 Operator's Obligations for Pilot's License Endorsement

23.4.1 Before the pilot can seek endorsement on his license for MFF operation, the operator must ensure that the pilot holds valid and current Certificates of Test on both Primary and Secondary MFF Aircraft types. The operator must also provide evidence to show that the pilot meets the pre-requisites for MFF operation and has successfully completed the MFF Programme.

23.5 Periodical Tests - MFF Pilots

Proficiency Checks

23.5.1 The operator shall ensure that each MFF pilot complete at least two proficiency checks within the period of 12 months immediately preceding any commercial flight, with such checks being separated by an interval of not less than 4 months. The first base check to be conducted after the completion of the MFF Programme shall be on the Aircraft type of the next expiring base check. Subsequent base checks shall alternate between Primary MFF Aircraft and Secondary MFF Aircraft.

Line Checks

23.5.2 The operator shall ensure that each MFF pilot complete one line check within the period of 12 months immediately preceding any commercial flight. The first line check to be conducted after the completion of the MFF Programme shall be on the Aircraft type of the next expiring line check. Subsequent line checks shall alternate between Primary MFF Aircraft and Secondary MFF Aircraft.

23.5.3 In the event the base or line check on the Primary MFF Aircraft or Secondary MFF Aircraft lapses, or a pilot failed the check, the operator shall not allow the pilot to carry out his flying duties. The pilot may carry out his flying duties when the particular base or line check on the lapsed or failed Aircraft type is renewed or revalidated.

MFF Recent Type Experience

23.5.4 The operator shall not assign a pilot to fly as an MFF Pilot-in-Command (PIC) unless he has carried out at least one take-off and one landing in either the Primary MFF Aircraft or Secondary MFF Aircraft during the previous 35 days period. Unless otherwise approved by the Authority, an MFF Pilot-in-Command or co-pilot shall, in the preceding 90 days, complete at least three take offs and three (3) landings, with at least one take-off and one landing in each of the Primary MFF Aircraft and Secondary MFF Aircraft. The take-off(s) and landing(s) can also be carried out in an approved flight simulator of the same type/class.

23.5.5 When a cruise relief pilot is flying several variants of the same type of aircraft or different types of aircraft with similar characteristics in terms of operating procedures, systems, and handling, the recency or refresher training may be combined, if approved by the Authority.

23.6 Cessations of MFF Operation by MFF Pilot

23.6.1 The operator shall inform the Authority of any MFF pilot who no longer carry out his flying duties as an MFF pilot.

23.7 Rostering MFF Pilots

23.7.1 The operator shall not roster an MFF pilot to operate on both Primary MFF Aircraft and Secondary MFF Aircraft within the same day or Flight Duty Period.

24 SPECIFIC APPROVAL

24.1 The term "specific approval" indicates a formal action on the part of the State of the Operator which results in an addition to the operations specification.

24.2 The following provisions make explicit reference to the need for a specific approval:

(a) MNPS - Minimum Navigation Performance Specification;

(b) RVSM - Reduced Vertical Separation Minimum;

(c) PBN - Performance-Based Navigation, including:

(i) RNAV - Area Navigation;

(ii) RNP - Required Navigation Performance;

(iii) Baro VNAV;

(iv) RNP AR

Note: *See CAAT Guidance Material for Performance Based Navigation (PBN)*

(d) Polar Routes;

(e) Data-link including:

(i) CPDLC and ADS-C,

(ii) ADS-B.

(f) Low visibility operation, use of automatic landing systems and operations with operational credits by use of a HUD or equivalent displayed, EVS, SVS or CVS, or any combination of those systems into a hybrid system; or

(g) ULR - Ultra Long Range flights; or

(h) PBCS – Performance-based Communication and Surveillance.

(i) Electronic Flight Bags (EFBs)

Note: *See CAAT Guidance Material for Performance-Based Communications and Surveillance (PBCS) Operational Approval.*

24.3 In addition; no specific approval shall be conducted, unless:

(a) The aircraft equipment is approved by the Authority;

(b) The aircraft equipment is installed and maintained in a manner approved by the Authority;

(c) The flight and ground crew are trained in accordance with policies and procedures approved by the Authority; and

(d) The aircraft is operated in compliance with the procedures and restrictions promulgated by the relevant authorities of the airspace in which the aircraft is flying.

24.4 In addition to paragraph 24.3, an operator seeking Reduced Vertical Separation Minimum (RVSM) specific approval shall comply with the following requirements.

24.4.1 Definitions

(a) Altimetry System Error (ASE) means the difference between the altitude indicated by the altimeter display, assuming a correct altimeter barometric setting, and the pressure altitude corresponding to the undisturbed ambient pressure.

(b) Total Vertical Error (TVE) means the vertical geometric difference between the actual pressure altitude flown by an aircraft and its assigned pressure altitude (flight level).

24.4.2 Requirements

(a) To qualify for RVSM specific approval, an aeroplane shall be equipped in accordance with the Requirement outlined in the Authority Announcement on RVSM and associated Guidance Material;

(b) The operator shall also comply with the airworthiness aspects of specific approval requirements set out in Chapter 11, paragraph 26 in this document; and

(c) The operator seeking RVSM specific approval shall also demonstrate to the satisfaction of the Authority that the vertical navigation performance capability of the aeroplane meets the Minimum Aircraft Systems Performance Specification (MASPS) requirements in paragraph 24.4.3 of this chapter.

24.4.3 Minimum Aircraft Systems Performance Specification (MASPS)

(a) The altimetry system performance for operation in RVSM airspace in respect of groups of aeroplanes that are nominally of identical design and build with respect to all details that could influence the accuracy of height-keeping performance capability shall be such that the Total Vertical Error (TVE) for the group of aeroplanes shall have a mean no greater than 25 m (80ft) in magnitude and shall have a standard deviation no greater than $28 - 0.013Z2$ for $0 \leq Z \leq 25$ when Z is the magnitude of the mean TVE in metres, or $92 - 0.004Z2$ for $0 \leq Z \leq 80$ where Z is in feet;

(b) In addition, the components of TVE shall have the following characteristics:

(i) The mean Altimetry System Error (ASE) of the group shall not exceed 25m (80ft) in magnitude;

(ii) The sum of the absolute value of the mean ASE and of three standard deviations of ASE shall not exceed 75 m (245ft); and

(iii) The differences between cleared flight level and the indicated pressure altitude actually flown shall be symmetric about a mean of 0 m (0ft), with a standard deviation no greater than 13.3 m (43.7 ft), and in addition, the decrease in the frequency of differences with increasing difference magnitude shall be at least exponential.

(c) In respect of aeroplanes for which the characteristics of the airframe and altimetry system fit are unique and so cannot be classified as belonging to a group of aeroplanes encompassed by item (a) and (b), the height-keeping performance capability shall be such that the components of the TVE of the aeroplane have the following characteristics:

(i) The ASE of the aeroplane shall not exceed 60 m (200ft) in magnitude under all flight conditions; and

(ii) The difference between the cleared flight level and the indicated pressure altitude actually flown shall be symmetric about a mean of 0 m (0ft), with a standard deviation no greater than 13.3 m (43.7ft), and in addition, the decrease in the frequency of differences with increasing difference magnitude shall be at least exponential.

24.4.4 Continuing Compliance of MASPS

(a) The operator with RVSM specific approval shall set in place a programme to ensure that a minimum of two aeroplanes of each aeroplane-type grouping have their height-keeping performance monitored at least once every two years or within intervals of 1000 flight hours per aeroplane, whichever period is the longer; and

(b) If the operator's aeroplane-type grouping consists of a single aeroplane, monitoring of that aeroplane shall be accomplished within the specified period.

CAAT Guidance Material for Reduced Vertical Separation Minimum (RVSM)

24.5 For operations where a navigation specification for Performance-Based Navigation (PBN) (i.e. Required Navigation Performance (RNP) or Area Navigation (RNAV)) specification has been prescribed, an aeroplane or a helicopter shall:

(a) Be provided with navigation equipment which will enable it to operate in accordance with the prescribed navigation specifications; and

(b) Be authorised by the Authority for operations in such airspace.

Note: *All operators requiring PBN approval shall apply to the Authority and refer to the guidance material for Performance-Based Navigation (PBN).*

24.6 For flights in defined portions of airspace where, based on Regional Air Navigation Agreement, Minimum Navigation Performance Specification (MNPS) are prescribed, an aeroplane shall be provided with navigation equipment which:

(a) Continuously provides indications to the flight crew of adherence to or departure from track to the required degree of accuracy at any point along that track; and

(b) Be authorised by the Authority for MNPS operations.

Note: *The prescribed MNPS and the procedures governing their application can be found in the Regional Supplementary Procedures (Doc 7030) and those for the North Atlantic MNPS Airspace are in the current edition of the "Guidance concerning Air Navigation and above the North Atlantic MNPS Airspace" (NAT 007).*

24.7 For operations in the conduct of instrument approach in low visibility and operations with operational credits, guideline in CAAT GM for All weather operation (AWO), FAA AC 120-118 or AMC and GM to Part SPA to Commission Regulation (EU) No 965/2012 may be used as guideline for granting a specific approval.

25 SECURITY PROGRAMME

25.1 The operator shall establish and implement a written security programme and shall ensure that such a programme meets the National Civil Aviation Security Programmes of CAAT.

26 FLIGHT DECK SECURITY

26.1 In all aeroplanes which are equipped with a flight crew compartment door, this door shall be capable of being locked, and means shall be provide by which cabin crew can discreetly notify the flight crew in the event of suspicious activity or security breaches in the cabin.

26.2 The operator shall not operate a passenger-carrying aeroplane with a maximum certificated take-off mass in excess of 54500 kg or aeroplane with maximum certificated take-off mass in excess of 45500 kg with passenger capacity greater than 19 or aeroplane with a passenger seating capacity greater than 60 unless it is equipped with an approved flight crew compartment door that is designed to resist penetration by small arms fire and grenade shrapnel, and to resist forcible intrusions by unauthorised persons.

26.3 In all aeroplanes which are equipped with a flight deck door required by paragraph 26.2, means this door shall be capable of being locked and unlocked from either pilot's station.

26.4 The operator shall stipulate a policy for locking the door to be acknowledge and performed by flight crew members providing that the door in accordance with paragraph 26.2 shall be closed and locked form the time that the first passenger gets inside the aircraft to the time that the last passenger gets outside the aircraft, except when necessary to permit access or egress for the Authority or other authorised persons.

26.5 The operator shall establish security measures of the flight crew compartment as follows;

(a) All aircraft which are equipped with a flight crew compartment door shall be provided with a measure to enable crew member to report suspicious behavior or potential threat to the security in the cabin to a flight crew member; and

(b) All aircraft in accordance with paragraph 26.2 shall be provided with a measure to enable monitoring the entire area of the flight crew member outside the door form working area of each pilot to identify persons requesting entry and to detect suspicious behavior or potential threat.

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27 ADMISSION TO THE FLIGHT DECK

27.1 The Pilot-in-Command shall ensure that no person, other than a flight crew member assigned to a flight, is admitted to, or carried in, the flight deck unless the person is:

(a) A crew member in the performance of his or her duties;

(b) A competent official responsible for certification, licensing or inspection;

(c) A person required to be in the flight deck compartment for technical, operational, training, or official flight deck familiarisation reasons formally authorised in accordance with the operator's Operations Manual; and

(d) Any other persons or classes of persons as approved by the Authority to be admitted to the flight deck. The list of such persons or classes of persons shall be included in the Operations Manual.

27.2 The Pilot-in-Command shall ensure that:

(a) In the interest of safety, admission into the flight deck does not cause distraction and/or interfere with the flight's operation;

(b) All persons carried on the flight deck are made familiar with the relevant safety and security procedures.

27.3 The final decision regarding the admission to the flight deck shall be the responsibility of the Pilot-in-Command.

28 CONTROL OF INFECTIOUS DISEASES[2]

28.1 Operators must have written procedures and guidelines available to all operating staff for the handling of any outbreak of infectious diseases at destination(s) to which operate.

28.2 Operators shall ensure that all operating staff are familiar with such procedures and guidelines related to the handling of outbreak of infectious diseases.

28.3 The operator shall also include instruction for the Pilot-in-Command of an aircraft that a suspected communicable disease is reported promptly to the ATC in order to facilitate provision for the presence of any special medical personnel and equipment necessary for the management of public health risks on arrival. The details shall include:

(a) Aircraft identification;

(b) Departure aerodrome;

(c) Destination aerodrome;

(d) Estimated time of arrival;

(e) Number of persons on board;

(f) Number of suspected case(s) on board; and

(g) Nature of the public health risk, if known.

[2] *As defined by World Health Organisation.*

28.4 Operators shall ensure that all concerned operating staff are familiar with PANS ATM DOC 4444.

29 AEROPLANE PERFORMANCE OPERATING LIMITATIONS

Requirements for Large Aeroplanes

29.1 This section (paragraphs 29.1 to 29.8) applies to aeroplanes certificated with maximum total weight authorised greater than 5700 kg operated by the operator.

29.2 The operator shall not permit a flight to be commenced unless the performance information provided in the flight manual, supplemented as necessary with other data acceptable to the Authority (including contaminated runway landing distance data, provided by the aeroplane manufacturer and acceptable to the Authority), indicates that the requirements of this section can be complied with for the flight to be undertaken.

29.3 In applying the requirements in this paragraph, the operator shall take into account all factors that significantly affect the performance of the aeroplane, including, but not limited to the weight of the aeroplane, the operating procedures, the pressure-altitude appropriate to the elevation of the aerodrome, the ambient temperature, the wind, the runway slope, and the surface conditions of the runway for landplanes and water surface condition for seaplanes. Such factors shall be taken into account directly as operational parameters or indirectly by means of allowances or margins which may be provided in the scheduling of performance data or in the comprehensive and detailed code of performance in accordance with which the aeroplane is being operated.

29.4 The operator shall ensure, for each aeroplane it operates, that:

(a) The weight at the start of its take-off is not greater than the weight necessary to comply with paragraph 29.5, allowing for expected reductions in weight as the flight proceeds, and for such fuel jettisoning or diversion as is envisaged in applying paragraph 29.6 and, in respect of alternate aerodromes, paragraphs 29.4 (c) and 29.7;

(b) The weight at the start of take-off does not exceed the maximum take-off weight specified in the aeroplane flight manual for the pressure-altitude appropriate to the elevation of the aerodrome, and, if used as a parameter to determine the maximum take-off weight, any other local atmospheric condition;

(c) The estimated weight for the expected time of landing at the aerodrome of intended landing and at any destination alternate aerodrome does not exceed the maximum landing weight specified in the flight manual for the pressure altitude appropriate to the elevation of those aerodromes, and if used as a parameter to determine the maximum landing mass, any other local atmospheric condition;

(d) The weight at the start of take-off, or at the expected time of landing at the aerodrome of intended landing and at any destination alternate aerodrome, exceed the relevant maximum weights at which compliance has been demonstrated with the applicable noise certification standards in Volume I of Annex 16 to the Convention of International Civil Aviation, unless otherwise authorised in exceptional circumstances for a certain aerodrome or a runway where there is no noise disturbance problem, by the competent authority of the state of the aerodrome.

29.5 Take-off

The operator shall ensure, for each aeroplane it operates, that in the event of a critical engine failing, or for other reasons, at any point in the take-off, the aeroplane is able to either to discontinue the take-off and stop within the accelerate-stop distance available, or to continue the take-off and clear all obstacles along the flight path by an adequate vertical or horizontal distance until the aeroplane is in a position to comply with paragraph 29. 6. When determining the resulting take-off obstacle accountability area, the operating conditions, such as the cross-wind component and navigation accuracy, must be taken into account. In determining the length of the runway available, the operator shall take into account the loss, if any, of runway length due to alignment of the aeroplane prior to take-off.

29.6 En-route

The operator shall ensure, for each aeroplane it operates, that:

(a) In the event of the critical engine becoming inoperative at any point along the route or planned diversions there from, the aeroplane is able to continue the flight to an aerodrome at which the requirements of paragraph 29.7 can be met, without flying below the minimum flight altitude at any point.

(b) In the case of aeroplanes having three or more engines, on any part of a route where the location of en-route alternate aerodromes and the total duration of the flight are such that the probability of a second engine becoming inoperative must be allowed for if the general level of safety implied by the standards of this chapter is to be maintained, the aeroplane is able, in the event of any two engines becoming inoperative, to continue the flight to an en-route alternate aerodrome and land.

29.7 Landing

The operator shall ensure, for each aeroplane it operates, that the aeroplane shall at the aerodrome of intended landing and at any alternate aerodrome, after clearing all obstacles in the approach path by a safe margin, be able to land, with assurance that it can come to a stop or, for a seaplane, to a satisfactorily low speed, within the landing distance available. Allowance shall be made for expected variations in the approach and landing techniques, if such allowance has not been made in the scheduling of performance data.

29.8 Obstacle data

The operator shall obtain obstacle data to develop procedures to comply with paragraph 29. 5 and shall take into account of charting compliance with Additional Requirements for Single-Engine Aeroplanes

29.9 Subject to paragraph 29.10, a single-engine aeroplane shall only be operated in conditions of weather and light, and over such routes and diversions there from, that permit a safe forced landing to be executed in the event of engine failure.

29.10 An operator intending to operate single-engine turbine-powered aeroplanes at night and/or in IMC shall satisfy the Authority that the airworthiness certification of the aeroplane is appropriate and that the overall level of safety is ensured by:

(a) The reliability of the turbine engine;

(b) The operator's maintenance procedures, operating practices, flight dispatch and crew training programmes;

(c) Equipment and other requirements provided in accordance with Appendix M; and

(d) Automatic engine trend monitoring system.

Note: *Target level of safety (TLS) - A generic term representing the level of risk which is considered acceptable in particular circumstances.*

29.11 En-route Performance Drift Down

(a) Operators should be aware of the routes on which the en-route performance of their aircraft, following the failure of one or two engines, will be critical and should include instructions relating to such routes in their operations manuals in order to reduce the risks which could arise from indecision or error in the case of engine failure;

(b) In the case of critical routes it may, in some cases, be possible to regulate the aircraft's planned take-off weight to such an extent that its drift-down performance following engine-failure (in the case of turbine-engine aircraft from a height not exceeding the maximum re-light altitude) will enable it to clear all obstacles on its route by the required margin regardless of the point at which the failure occurs. In other cases, it may be necessary to calculate a critical point, or a number of critical points, which would determine the action to be taken in the event of engine failure at any given position, ie. turn back, continue along the planned route or divert along an alternative route;

(c) Instructions should take into account the accuracy of navigation which may be expected of the flight crew in view of the crew complement and the aids available. Account should also be taken of the effect of varying meteorological conditions. Assumed winds and temperatures used in the calculation of the critical point(s) must be indicated because, if forecast or actual conditions differ from these used at the planning stage, the Pilot-in-Command may require to amend the drift-down procedure.

30 OPERATING INSTRUCTIONS

30.1 The operator shall ensure that all operations personnel are properly instructed in their particular duties and responsibilities and the relationship of such duties to the operation as a whole.

30.2 The operator shall not permit an aeroplane in his charge to be taxied on the movement area of an aerodrome by a person other than a flight crew member, unless that person, seated at the controls:

(a) Has been duly authorised by the operator or its designated agent and is competent to taxi the aeroplane and to use the radio telephone;

(b) Has received instruction and continuation training in respect of aerodrome layout, routes, signs, marking, lights, air traffic control signals and instructions, phraseology and procedures, and is able to conform to the operational standards required for the safe aeroplane movements at the aerodrome; and

(c) Where applicable, has received permission from the aerodrome operator to taxi the aeroplane at the aerodrome.

31 USE OF AIRBORNE COLLISION AVOIDANCE SYSTEM (ACAS)

31.1 The operator shall establish procedures to ensure that:

(a) When ACAS is installed and serviceable, it shall be used in flight in a mode that enables Resolution Advisories (RA) to be produced unless to do so would not be appropriate for conditions existing at the time.

(b) When undue proximity to another aircraft (RA) is detected by ACAS, the pilots, unless doing so would jeopardize the safety of the aeroplane, shall follow the RA even if there is a conflict between the RA and an Air Traffic Control (ATC) instruction to maneuvers.

(c) Nothing in subparagraph 31.1(b) shall prevent the Pilot-in-Command from exercising his best judgement and full authority in the choice of action to resolve a traffic conflict or avert a potential collision.

*Refer to procedure in ICAO Doc 8168 PANS OPS Volume I.

(d) Unless otherwise specified in an air traffic control instruction, to avoid unnecessary Airborne Collision Avoidance System (ACAS II) resolution advisories in aircraft at or approaching adjacent altitudes or flight levels, an aeroplane climbing or descending to an assigned altitude or flight level, especially with an autopilot engaged, shall do so at a rate less than 1500 ft/min or 8 m/sec (depending on the instrumentation available) throughout the last 300 m (1000 ft) of climb or descent to the assigned level when the pilot is made aware of another aircraft at or approaching an adjacent altitude or flight level

Note: *Material concerning the development of these procedures can be found in the PANS- OPS (Doc 8168) Volume I, Part III, Section 3, and Chapter 3.*

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32 OPERATIONAL CONTROL

32.1 The operator is required to establish in its Operations Manual, the parties responsible for operational control, the related policies, processes, standards and procedures for the management of all flights. This would include procedures such as the preparation and dissemination of pre-flight aeronautical information contained in the AIP, AIC and AIRAC.

32.2 Additional information on Operational Control is provided in Appendix O of this document.

33 AIRCRAFT TRACKING

33.1 The operator shall track the position of an aeroplane through automated reporting at least every 15 minutes for the portion(s) of the in-flight operation(s) under the conditions as stated in subitem (a) or (b) unless the appropriate air traffic service unit is able to do so:

(a) The aeroplane with a maximum certificated take-off mass of more than 27,000 kg and maximum operational passenger seating configuration (MOPSC) greater than 19;

(b) All aeroplane with a maximum certificated take-off mass of more than 45,500 kg.

Note: See CAAT Guidance Material for Aircraft Tracking and Cir347 (Aircraft Tracking Implementation Guidelines)

33.2 In the event that operator is unable to track a particular aeroplane or flight in accordance with paragraph (33.1) due to temporary operational constraints, the operator may continue to operate that aeroplane or flight if;

(a) there are appropriate mitigating measures in place for locating the aeroplane when needed;

(b) the operator makes a report of the non-tracking situation to the Authority within 72 hours after the termination of the affected flight; and

(c) the procedures to monitor aeroplanes that could not be tracked are in the operator's Operations Manual.

33.3 The operator shall establish procedures, in the Operations Manual, approved by the Authority for the retention of aircraft tracking data to assist Search and Rescue (SAR) in determining the last known position of the aircraft and shall develop procedures for third parties that perform related work on its behalf.

33.4 Operators shall ensure that they have established and documented:

(a) a training programme for flight operations officers/flight dispatchers, or other personnel nominated by the operator for the control and supervision of flights, on the policies and procedures for aircraft tracking; and

(b) procedures for the monitoring of automated aircraft position reports, including actions to take in the event of a missed position report.

34 CREW BRIEFINGS

34.1 An operator is required to establish crew briefings as an integral part of SOPs. The conduct of departure and approach briefing for situational awareness shall be established.

35 DOCUMENTS TO BE CARRIED

35.1 The operator shall ensure that all the following documents are carried on all its aircraft:

(a) Certificate of Registration;

(b) Certificate of Airworthiness;

(c) Licences and Medical Assessment of the Flight Crew;

(d) Radio Licence;

(e) Noise Certification;

(f) Third-Party Liability Insurance Certificate(s); and

(g) Certified True Copy Air Operator Certificate and Copy of Operations Specifications Relevant to the Aircraft Type;

36 ACCIDENT PREVENTION AND FLIGHT SAFETY

36.1 Operators are to establish and maintain accident prevention and flight safety programmes under the supervision of a person specifically nominated for the purpose. Operators should refer to ICAO Doc 9859 - 'Safety Management Manual' which contains information and guidance on Flight Data Analysis Programmes.

37 ACCIDENT REPORTING

37.1 Provision must be made for all operating staff to have ready access to the prescribed requirements for the reporting and investigation of accidents. In particular, operating staff should be familiar with the definitions used in the legislation, the duty to furnish information, and the rules governing the removal of damaged aircraft.

37.2 Instructions must be issued on the reporting of accidents occurring overseas to the regulating authority of the country concerned and the action necessary to prevent removal or interference with any part of the aircraft without proper permission. This is in addition to operators' existing responsibility to inform the Authority. The operations manual should contain the address and telephone numbers of the Aircraft Accident Investigation Committee (AAIC).

37.3 If doubt exists on whether an occurrence is an accident or an incident, it should be reported to the Aircraft Accident Investigation Committee (AAIC) who will decide on its classification.

37.4 All aeroplanes which are required to record pilot input and/ or control surface position of primary control (pitch, roll, yaw) for which the application for type certification is submitted to the Authority and which are required to be flitted with an FDR shall record interval of 0.125 seconds.

Note: *For aeroplanes with control systems in which movement of a control surface will back drive the pilot's control, "or" applies. For aeroplanes with control systems in which movement of a control surface will not back drive the pilot's control, "and" applies. In aeroplanes with independent moveable surfaces, each surface needs to be recorded separately. In aeroplanes with independent pilot input on primary control, each pilot input on primary controls needs to be recorded separately.*

37.5 To preserve flight recorder records, flight recorders shall be de-activated upon completion of flight time following an accident or incident. The flight recorders shall not be re-activated before their disposition as determined by the investigation authority and in accordance with the ICAO standards. Flight recorder means flight data recorder and/or cockpit voice recorder, where applicable.

37.6 Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/maintenance information of the flight data recorder should be maintained by the operator. The documentation must be sufficient to ensure that accident investigation authorities have the necessary information to read the data in engineering units.

38 INTERCEPTION PROCEDURE

In accordance with the ICAO SARPs under Annex 6, a copy of the following notified procedures must be carried on board the aircraft:

(a) Procedures to be followed by the Pilot-in-Command of an intercepted aircraft; and

(b) Notified visual signals for use by intercepting and intercepted aircraft. For instance, these are available in reference publications such as the AERAD flight guide supplement and JEPPESEN manuals.

39 AUTOMATIC DEPENDENT SURVEILLANCE BROADCASTS (ADS-B) OUT OPERATIONS

39.1 ICAO's Asia-Pacific Regional Group has decided to use the 1090 MHz (Mode S) Extended Squitter datalink as the globally interoperable link for ADS-B operations. ICAO has also issued a number of technical and operational standards to support its introduction.

39.2 Operators wishing to operate in ADS-B airspace are to submit their proposed procedures to the Authority for acceptance, prior to including such procedures in their operations manual. All operators requiring ADS-B specific approval shall apply to the Authority.

39.3 For flights in ADS-B airspace, an aircraft shall be equipped with either:

(a) The ADS-B equipages that have been certificated as meeting EASA Acceptable Means of Compliance AMC 20-24 'Certification Considerations for Enhanced ATS in Non-Radar Areas using ADS-B Surveillance (ADS-B-NRA) via 1090 MHZ Extended Squitter', or

(b) The ADS-B equipages that meet the equipment configuration standards of Australia Civil Aviation Order 20.18 Appendix XI or other reputable authority standards such as the FAA.

39.4 The criteria for granting the ADS-B specific approval are:

(a) The continuing airworthiness of ADS-B system must be assured. As part of the specific approval process, existing established maintenance practices or a proposed maintenance programme for the aircraft needs to be reviewed to ensure that it meets relevant requirements;

(b) The Minimum Equipment List needs to reflect the functional requirements of the ADS-B system;

(c) Appropriate flight operations training programme and operational procedures are established to ensure that pilots are knowledgeable about ADS-B operations and their on-board operational equipment.

40 OPERATING CONSIDERATIONS AND FACILITIES

40.1 An operator shall ensure that a flight will not be commenced unless it has been ascertained by every reasonable means available that the ground and/ or water facilities available and directly required on such flight, for the safe operation of aircraft and the protection of the passengers, are adequate for the type of operation under which the flight is to be conducted and are adequately operated for this purpose.

40.2 An operator must ensure that a flight will not commence or continue as planned unless it has been ascertained by every reasonable mean available of departure to aerodrome of arrival, including the intended take-off, destination and en-route alternate aerodromes, can be safely used for planned operation. When intending to operate over or near conflict zone, a risk assessment must be conducted and appropriate risk mitigation measures taken to ensure a safe flight.

Note 1: *"Reasonable means" in this Standard is intended to denote the use, at the point of departure or while the aircraft is in flight, of information available to the operator either through official information published by the aeronautical information service or readily obtainable from other sources.*

Note 2: *Guidance on safety risk assessments can be found in the Safety Management Manual (SMM)(DOC 9859)*

Note 3: *The Risk Assessment Manual for Civil Aircraft Operations Over or Near Conflict Zones (DOC10084) contains further guidance on risk assessment for air operators when flying over or near conflict zones.*

40.3 An operator shall ensure that any inadequacy of facilities observed in the course of operations is reported to the authority responsible for them, without undue delay.

40.4 Subject to their published conditions of use, aerodromes and their facilities shall be kept continuously available for flight operations during their published hours of operations, irrespective of weather conditions.

40.5 An operator shall, as part of its safety management system, assess the level of Rescue and Fire Fighting Service (RFFS) protection available at any aerodrome intended to be specified in the operational flight plan in order to ensure that an acceptable level of protection is available for the aeroplane intended to be used.

40.6 Information related to the level of RFFS protection that is deemed acceptable by the operator shall be contained in the operations manual after acceptance by the Authority.

Note: *ICAO Annex 6 Part I Attachment I contains guidance on assessing an acceptable level of RFFS protection at aerodromes.*

41 MINIMUM EQUIPMENT LISTS

41.1 Operators shall not operate aircraft with unserviceable equipment, except under the approval granted by the Authority. Such Approval will be granted only after the content of the proposed Minimum Equipment List (MEL) has been vetted and found acceptable by the Airworthiness and Engineering Department and Flight Operations Standards Department.

41.2 The introduction to any MEL must contain a statement reminding the aircraft commander of his responsibility to ensure that the aircraft is in every way fit for the intended flight, and that he may apply a higher minimum standard if, in his opinion, it is necessary to do so in order to secure the safe operation of the aircraft.

41.3 MELs must be submitted to the Airworthiness and Engineering Department at the time of an application for an AOC or a variation which covers the introduction of a new aircraft type, as should instructions and guidance to commanders on the operation of aircraft with deferred defects. The content of operators' MELs may not be less restrictive than that of the associated Master Minimum Equipment List (MMEL). Should an MMEL become more restrictive due to amendment action, operators must amend their MELs similarly.

41.4 When the carriage of unserviceable equipment results in a deviation from the normal drills, satisfactory alternative drills must be specified in the manual. For example, when thrust reversers are listed as minimum equipment, the operator must publish alternative drills.

41.5 The MEL should also include information on Configuration Deviation List (CDL).

42 CONFIGURATION DEVIATION LISTS

The CDL(s), if provided by the manufacturer, taking account of the aircraft types and variants operated, including procedures to be followed when an aircraft is being dispatched under the terms of its CDL.

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CHAPTER 3

AIRCRAFT LOADING

1 GENERAL

Operators are responsible for the safe dispatch of their aircraft following cargo and passenger loading. In particular, the operator shall have written procedures for handling agents to ensure that any incident or damage to the aircraft during loading must be reported and assessed for airworthiness significance prior to flight.

1.1 Loading instructions should be provided to traffic staff, handling agents, cabin and flight crew, the complete detailed guidance on all aspects of the loading, weight and balance of aircraft, including in particular instructions on:

1.1.1 Controlling and promulgating the basic Aircraft Prepared for Service (APS) weights or Dry Operating Weights (DOW) and indices;

1.1.2 Regulating the carriage and stowage of baggage and freight in passenger compartments, including particular instructions concerning the amount of hand baggage allowed and how it is to be stowed. It is essential that emergency exits, aisles and dinghy launching stations, are kept clear during take-off and landing. (Operators should also take steps to ensure that their traffic staff and agents comply with these instructions);

1.1.3 Carriage of dangerous goods;

1.1.4 Limitations on floor loading, use of weight spreading devices and positioning and securing of ballast;

1.1.5 Checking that items of freight or baggage required to be in particular compartments or holds are properly stowed. The person responsible for the trim of the aircraft must give written instructions to the person responsible for the actual loading;

1.1.6 Advising the Pilot-in-Command and cabin crew of essential seating restrictions;

1.1.7 The effect on RTOW of such factors as the maximum zero fuel weight, landing weight restrictions at planned destination, take-off and climb performance requirements at the departure aerodrome and enroute performance requirements;

1.1.8 Relevant C of A or flight manual limitations;

1.1.9 Fuel loading limitations;

1.1.10 Where appropriate, any special loading limitations for ferrying aircraft with one engine inoperative, C of A tests etc;

1.1.11 Where applicable the use of standard weights, or where not specified, such weights approved by the Authority.

1.2 Freight loading instructions should include the following additional details:

1.2.1 Diagram of cabin bays and cargo holds, with dimensions, to facilitate the pre-planning of cargo distribution;

1.2.2 Particulars of the strength and usable directions of all lashing points and/or rings and details of the spacing between lashing points;

1.2.3 Information on the types and working strengths of lashings provided, and directions for stowage when not in use;

1.2.4 Instructions concerning special cases such as the loading of stretchers, carriage of livestock, etc.;

1.2.5 Where appropriate, instructions on the handling, loading and securing of pallets or containers.

1.3 The practice of letting a load/trim sheet serve as loading instructions is not acceptable, and the use of a trim slide rule does not dispense with the requirement to complete a load sheet.

1.4 It is a statutory requirement that the position of the laden centre of gravity should be given on the load sheet. For this purpose, a trim sheet may be regarded as part of the load sheet even though it may be a separate document. It is essential that the complete document includes particulars of the manner in which the load is distributed, and special attention should be paid to the wording of the loading certificate. The mandatory requirement may be met by establishing that the C of G lies within the permissible limits and it may not be essential to determine its precise position unless it needs to be known in connection with aircraft handling or other factors. The load sheet should bear the reference of the APS form used and, if average weights have been used, an endorsement to that effect.

1.5 Where a ‘loading plan’ method is used, operators should show in their loading instructions the basic assumptions upon which the plan is formulated and should specify C of G limits more stringent than those permissible under the C of A. They should also confirm in the loading instructions that loading in accordance with the ‘plan’ will ensure that the laden C of G always falls within the restricted limits. If this is done, a simple statement on the load sheet that the laden C of G is between X and Y (i.e. the operator’s more stringent limits) can be accepted.

1.6 Traffic staff and handling agents (including agents at overseas aerodromes) should be provided with:

1.6.1 Loading instructions;

1.6.2 Current APS forms for all types, marks and variants of aircraft being used;

1.6.3 Details of the RTOW and fuel load for each flight.

1.7 Where traffic staff and handling agents are responsible for calculating the RTOW, operators should ensure that they have sufficient knowledge to do so and are provided with all relevant information.

2 LOAD SHEET CONTENTS

2.1 The load sheet, together with the APS form, should account for all items of the laden weight. Although they may not always be specified individually, the following are examples of items to be covered:

2.1.1 Fuel, Water Methanol, Oil, Hydraulic Fluid, Drinking Water, Toilet Water, De-Icing Fluid;

2.1.2 Passenger Seats, Children's Cots, Cabin floor covering and removable bulkheads;

2.1.3 Galley equipment including URNs, Hot Cups, etc.;

2.1.4 Food and beverages to be consumed in flight;

2.1.5 Bar stocks including the weight of the box or other container;

2.1.6 Navigation bag or aircraft library and navigational equipment;

2.1.7 Passengers' hold baggage;

2.1.8 Passengers' cabin baggage, unless this is accounted for elsewhere;

2.1.9 Flight spares and tools, spare hydraulic or de-icing fluid, etc;

2.1.10 Freight;

2.1.11 Aircraft crew baggage;

2.1.12 Life-saving rafts, life vests (including demonstration life vests), flotation cots, survival packs, blankets, pillows and similar equipment;

2.1.13 Weight spreaders, lashing, ballast, etc;

2.1.14 All items of removable equipment and removable radio carried on the particular flight;

2.1.15 Food and necessary equipment when livestock is carried.

2.2 Load sheets are required to be annotated to show whether actual, standard, or approved notional weights of passengers and their baggage have been used.

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3 CARRIAGE OF DANGEROUS GOODS

3.1 The operator shall determine the nominated person at an appropriate level within the organization as responsible for dangerous goods policy may be carried by passenger and (e.g. processes for provision of information etc.) and also provide personnel who must be trained in the requirements commensurate with their responsibilities.

3.2 The Regulation on the Civil Aviation Authority of Thailand Number 4 on Transportation of Dangerous Goods by Air sets out the requirements to be complied by an operator carrying dangerous goods. The carriage of dangerous goods shall be in accordance with the latest edition of the ICAO Doc 9284 Technical Instructions for the Safe Transport of Dangerous Goods by Air, herein referred to as Technical Instructions (TI).

3.3 An operator must obtain a Dangerous Goods specific approval issued by the Authority in order to transport dangerous goods. An operator applying for such a specific approval is required to give full details of its procedures, including the acceptance, handling, storage, loading of the dangerous goods, etc; before the intended date of carriage. In cases of extreme urgency, or when other forms of transport are inappropriate, or full compliance with the prescribed requirements is contrary to public interest, the Authority may grant an exemption from the provisions of the ICAO Doc 9284 TI provided that in such cases every effort is made to achieve a level of safety equivalent to that provided by those TI.

3.4 The operator must indicate in its Operations Manual whether or not it holds a Dangerous Goods specific approval from the Authority. The content of operation manual of the operator, whether approved or non-approved dangerous goods carrier, shall be in accordance with appendix B, Paragraph 2.1.35 and the Guidance Material for the preparation of dangerous goods section in the Operations Manual – Aeroplanes and Helicopters.

3.5 An operator holding a Dangerous Goods specific approval must include in its Operations Manual procedures on the use of an acceptance checklist. The use of such a checklist is to prevent the inadvertent acceptance of dangerous goods for carriage by air unless they are accompanied by a completed dangerous goods transport document and to verify that, as far as is practical, the package or freight container complies with the requirements of the Technical Instructions (TI).

3.6 An operator holding a Dangerous Goods specific approval must also develop procedures to enable its staff or the ground handling agent to carry out their duties, including appropriate loading, segregation of incompatible dangerous goods and inspection for damage and performing of leakage procedures. Other procedures to be developed by the operator includes the provision of written Notification To Captain (NOTOC) as specified in the TI. A legible copy of the information provided to the Pilot-in-Command must be retained on the ground. This copy must have an indication on it, or with it, that the Pilot-in-Command has received the information. A copy, or the information contained in it must be readily accessible to the flight operations officer, flight dispatcher, or designated ground personnel responsible for flight operations until after the arrival of the flight. These procedures and instructions shall apply from the time dangerous goods are accepted for carriage until they cease to be in the care of the operator or its ground handling agent.

3.7 There are general exceptions for certain types of dangerous goods which do not require a specific approval for carriage. These include installed aircraft equipment, certain items carried by passengers or crew and items required for use in flight to provide veterinary aid to an animal or medical aid to a person. All operators, regardless if it holds a Dangerous Goods specific approval, are required to provide guidance to its crew on what items constitute dangerous goods and what items can be carried on-board the aircraft in all circumstances.

3.8 All operators are required to provide initial and recurrent training to flight and cabin crew on the transportation of dangerous goods by air as specified in the TI. This training applies even if the operator does not hold a Dangerous Goods specific approval, since incidents may arise from dangerous goods taken on board an aircraft unwittingly. In addition, all operators shall also ensure that all other relevant staff including staff of his handling agent involved with the carriage of passengers or cargo by air, has received initial and recurrent dangerous goods training as specified in the TI.

3.9 All operators must report to the Authority, within the timeframe indicated in The Civil Aviation Authority of Thailand Requirement No. 22/2562 on "Reporting of Civil Aviation Occurrences" any accidents or incidents rising from the carriage of dangerous goods.

3.10 All operators approved for the public transport of passengers, including those that do not hold a dangerous Goods approval, shall ensure that dangerous goods notices for passengers, advising on the type of dangerous goods that are prohibited to be brought on-board the aircraft, are displayed prominently at places visible to passengers (such as check-in desks, ticket sales desks and aircraft boarding areas). All operators shall ensure that information on the carriage of dangerous goods is brought to the attention of passengers during check-in. As passengers may, either in ignorance or deliberately, try to take prohibited items onto the aircraft in either their checked or carry-on baggage, the operator should train its agents and check-in staff accordingly and put in place procedures to address this issue.

Note: *The list of items that passengers can carry is found in Part 8, Chapter 1 of the TI.*

3.11 Forbidden Dangerous Goods

3.11.1 All operator must not offer, carriage or accept in an aircraft:

(a) The dangerous goods specifically identified by name or by generic description in ICAO Technical Instructions, as being forbidden for transport by air under any circumstances;

(b) The dangerous goods identified in ICAO Technical Instructions as being forbidden for transport by air under normal circumstances;

(c) Any other dangerous goods, unless in accordance with the provisions of the Authority Regulations and the requirements and standards prescribed in ICAO Technical Instructions.

3.11.2 Exemption:

(a) The Authority may, upon application in writing by any person or operator exempt the application of 3.11.1, in the case of:

i. Extreme urgency; or

ii. Other forms of transport are inappropriate; or

iii. Full compliance with the prescribed requirement is contrary to public interest.

(b) The Authority may grant an exemption if the applicant has made every effort to achieve the overall level of safety in transport which is equivalent to the level safety provided for in the ICAO Technical Instructions.

For the state of overflight, if none of the criteria for granting an exemption are relevant, an exemption may be granted based solely on whether it is believed that an equivalent level of safety in air transport has been achieved.

Note 1: *For the purpose of approvals, "States concerned" are the States of Origin and the Operator, unless otherwise specified in these Instructions.*

Note 2: *For the purpose of exemptions, "States concerned" are the States of Origin, Operator, Transit, Overflight and Destination.*

Note 3: *Guidance for the processing of exemptions, including examples of extreme urgency, can be found in the Supplement to the Technical Instructions (Part S-1;1.2 and 1.3).*

Note 4: *Refer to 1;2.1 in ICAO Technical Instruction for dangerous goods forbidden for transport by air under any circumstance.*

Note 5: *Due to the differences in the type of operations carried out by helicopters compared with aeroplanes, some additional considerations need to be made when dangerous goods are carried by helicopter, can be found in Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc9284) item 7;7.*

3.12 Packing

Packing requirements

The operator shall ensure that Dangerous Goods are packed in accordance with the following requirements:

(a) Dangerous goods shall be packed in accordance with the provisions as provided in the Technical Instructions;

(b) The packaging shall be of good quality and shall be constructed and securely closed so as to prevent leakage which might be caused in normal conditions of transport, by changes in temperature, humidity or pressure, or by vibration;

(c) Packaging shall be suitable for the contents. packaging in direct contact with dangerous goods shall be resistant to any chemical or other action of such goods in accordance with the Technical Instructions;

(d) Packaging shall meet the material and construction specifications in the Technical Instructions.

(e) Packaging shall be tested in accordance with the provisions of the Technical Instructions.

(f) Packaging for which retention of a liquid is a basic function, shall be capable of withstanding, without leaking, the pressure stated in the Technical Instructions.

(g) Inner packaging shall be so packed, secured or cushioned as to prevent their breakage or leakage and to control their movement within the outer packaging(s) during normal conditions of air transport. Cushioning and absorbent materials shall not react dangerously with the contents of the packaging.

(h) No packaging shall be re-used until it has been inspected and found free from corrosion or other damage. Where a packaging is re-used, all necessary measures shall be taken to prevent contamination of subsequent contents.

(i) If, because of the nature of their former contents, uncleaned empty packaging may present a hazard, they shall be tightly closed and treated according to the hazard they constitute.

(j) No harmful quantity of a dangerous substance shall adhere to the outside of packages.

3.13 Aircraft loading restrictions

(a) Except as provided in paragraph (b), an operator shall not carry dangerous goods in an aircraft cabin occupied by passengers or on the flight deck of an aircraft.

(b) An operator may

(i) Permit a passenger or crew member to carry dangerous goods in checked or carry-on baggage or on their person if permitted to do so under the Technical Instructions; and

(ii) Permit carriage of radioactive material in an aircraft cabin occupied by passengers or on the flight deck of an aircraft if permitted to do so as an excepted package under the Technical Instructions; and

(iii) Carry dangerous goods in a main deck cargo compartment of an aircraft that carries passengers if the compartment meets all certification requirements for a class B cargo or baggage compartment.

(iv) Each operator who accepts dangerous goods for carriage by air shall load packages of dangerous goods bearing the Cargo Aircraft Only label on cargo aircraft.

(c) Incompatible Dangerous Goods

An operator who accepts dangerous goods for carriage by air shall not stow packages containing dangerous goods which might react dangerously together, next to each other or in a position that would allow interaction between them in the event of leakage.

(d) Separation, segregation, and security

Each operator who accepts dangerous goods for carriage by air shall:

(i) Stow packages of poisons and infectious substances in accordance with the Technical Instructions; and

(ii) Stow radioactive materials separate from persons, live animals, and undeveloped film in accordance with the Technical Instructions; and

(iii) Protect the dangerous goods loaded on an aircraft from being damaged; and

(iv) Secure such goods in the aircraft in a manner that will prevent any movement in flight which would change the orientation of the packages.

(e) Loading inspection

An operator shall not load:

(i) A package or over pack containing dangerous goods onto an aircraft or into a unit load device unless it has been

1. Inspected immediately prior to loading; and
2. Found free from evidence of leakage or damage; and

(ii) A unit load device onto an aircraft until the device has been

1. Inspected immediately prior to loading; and
2. Found free of any evidence of leakage from, or damage to, any dangerous goods contained within.

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4 CARRIAGE OF MUNITIONS OF WAR

4.1 An operator must obtain a Munitions of War permit from the Authority in order to transport Munitions of War. An operator applying for such a permit shall submit to the Authority no later than 7 days before the relevant date of shipment an application stating the munitions of war involved, and the following information:

(a) The reason why it is essential for the munitions of war to be carried by air;

(b) A proposal (including any safety control measures specified by the applicant) on achieving a level of safety equivalent to that provided by the instructions specified in the technical instructions;

(c) The proposed proper shipping name, classification and un number of the munitions of war with full supporting technical data;

(d) The proposed packaging;

(e) The quantity to be carried;

(f) Any special handling required and any special emergency response information;

(g) Names and addresses of the consignor and consignee; and

(h) The airports of departure and destination and the proposed dates of shipment and routing.

Note: *Munitions of war are defined as weapons, ammunition, articles materials or devices as are intended, adapted or designed for use in warfare or against the person.*

5 CARRIAGE OF LIVESTOCK

5.1 The carriage of livestock poses special problems particularly with regard to the determination of weights and to the control and restraint of animals such as horses, cattle, etc.

5.2 It will normally be acceptable for the weight of a consignment of livestock to be derived from the difference between the laden and unladed weight of the vehicle in which it is delivered to the aircraft, based on the evidence of an appropriate weighbridge certificate. The average weight per animal can then be calculated for trim purposes and must be indicated on the load sheet.

5.3 If horses are to be carried, application may be made to the Authority for permission to use authorised notional weights. When notional weights are used, the load sheet must be annotated accordingly.

5.4 Loading instructions should include details of the weight dimensions, construction, method of attachment and required restraints for horse boxes or animal pens used. Guidance should be given on:

5.4.1 The checks to be carried out before loading of horse boxes or animal pens - e.g. on general condition and serviceability of fittings and lashing points;

5.4.2 Quantities of food and water to be carried based on the length of the flight and the number of animals carried;

5.4.3 Number and type of good and water containers required;

5.4.4 Method of stowage of items of loose equipment such as food and water containers and horse accoutrements;

5.4.5 Method of loading horse boxes into aircraft and of tethering the horses inside them.

5.5 Operators will be expected to comply with the standards and practices specified in the current IATA Live Animals Regulations, which give guidance on an extensive range of subjects including the labelling and marking of live-animal containers, animal health and hygiene, feeding, loading and sedation. They also give comprehensive details of many types of containers, together with a list of the animals for which they may be used.

5.6 When horses or other large or potentially dangerous animals are to be carried, operators should ensure that the sedative drugs and ammunition for the captive bolt humane killer are appropriate to the animal and that at least one groom or attendant has been trained in their use.

5.7 The minimum number of attendants to be carried in particular circumstances, should be determined by the operator, in consultation with the consignor, and specified in the operator's instructions to Pilots-in-Command and to the staff responsible for loading arrangements. When carrying horses, one groom for each animal carried 'line ahead' and one groom for every two horses loaded side by side will normally be acceptable.

5.8 Where attendants are carried, it is essential that they should be able to communicate readily with the pilot-in-command during the flight, and that they are briefed before the flight on procedures to be followed in case of emergency.

5.9 If horses are to be carried and the attendants wish to stand with their animals for take-off and landing, the operator will need to seek exemption from the statutory requirement for passengers and crew to be secured in their seats. Application for such exemption may be made to the Authority.

5.10 Operators should provide clear instructions to their staff on the need, after a flight carrying animals, to check the aircraft carefully for damage to the structure, fittings, wiring, etc. and for any adverse effects resulting from urination or the high level of humidity frequently produced by animals in flight.

6 CARGO COMPARTMENT SAFETY

6.1 The operator shall establish policy and procedures for the transport of items in the cargo compartment in operation manuals, which include the conduct of a specific safety risk assessment. The risk assessment shall include at least the:

(a) Hazards associated with the properties of the items to be transported;

(b) Capabilities of the operator;

(c) Operational considerations (e.g. area of operations, diversion time);

(d) Capabilities of the aeroplane and its systems (e.g. cargo compartment fire suppression capabilities);

(e) Containment characteristics of unit load devices;

(f) Packing and packaging;

(g) Safety of the supply chain for items to be transported; and

(h) Quantity and distribution of dangerous goods items to be transported.

Note.1: *Specific Approval for transport of dangerous goods are contained in paragraph 3 of this chapter.*

Note.2: *Guidance on the hazards associated with the transport of items in the cargo compartment in accordance with ICAO Doc10102, the conduct of a specific safety risk assessment in accordance with the Safety Management Manual (SMM) (Doc 9859)*

6.2 Fire protection

6.2.1 The elements of the cargo compartment(s) fire protection system as approved by the State of Design or State of Registry has approved airworthiness standard, and a summary of the demonstrated cargo compartment fire protection certification standards, shall be provided in the aeroplane flight manual or other documentation supporting the operation of the aeroplane.

6.2.2 The Operator shall establish policy and procedures that address the items to be transported in the cargo compartment. These shall ensure to a reasonable certainty that in the event of a fire involving those items, it can be detected and sufficiently suppressed or contained by the elements of the aeroplane design associated with cargo compartment fire protection, until the aeroplane makes a safe landing.

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CHAPTER 4

TRAINING AND CHECKING

1 GENERAL REQUIREMENTS FOR CREW TRAINING AND CHECKING

1.1 The statutory requirements relating to crew training and periodical checking are specified in the Authority Announcement on Flight Crew Member Training Programmes. Training and checking are to incorporate Human Factors and Performance, and Crew Resource Management requirements. The primary purpose of this chapter is to indicate the nature of the arrangements considered necessary to ensure an adequate standard of compliance with the statutory provisions.

1.2 If the operator engages a separate training organisation to provide crew training, the operator shall ensure the training provided and flight documentations used by that training organisation shall be in accordance with the its flight safety documentation system.

1.3 Supervision of Training and Testing

1.3.1 A suitably qualified person should be designated to take general charge of arrangements for training and testing. His authority and responsibilities should be clearly defined.

1.4 Training staff and Examiners - General

1.4.1 The operator shall ensure that sufficient examiners and instructors are appointed to conduct the periodical tests and practical training as necessary. (Details of each examiner or instructor, except as provided for in paragraph 3.1.3, including his curriculum vitae shall be submitted to the Authority for approval prior to the appointment of the candidate).

1.4.2 The operator shall ensure that at least one Senior Authorized Flight Examiner is appointed if it has five or more AFEs, unless otherwise permitted by the Authority. An authorised flight examiner can also be interpreted as a Check Airman or Designated Check Pilot (DCP) approved by the Authority.

1.4.3 Examiners and instructors should be experienced and qualified for the work, and operators will be expected to arrange, where necessary, training in teaching and examining techniques.

1.5 Training Staff and Examiners - Flight Crew

1.5.1 The following tests of pilots' competence and, where applicable, flight engineers' competence is administered by Authorised Flight Examiners:

(a) Initial type rating tests - to qualify for type endorsement on a pilot's or flight engineer's license;
(b) Tests for the renewal of a type rating (Certificate of Test);
(c) Tests to extend the validity and initial issue of an instrument rating.

1.5.2 The operator shall only use Authorised Flight Examiners for aircraft type rating and instrument rating tests. The Authorised Flight Examiner shall hold the appropriate ratings for the tests being conducted.

1.5.3 A pilot examiner or instructor must be qualified under the provisions of the Authority Announcement to act as Pilot-in-Command of the aircraft, and his ability to perform the functions of a Pilot-in-Command while occupying the co-pilot's seat should be checked by the operator and recorded.

1.5.4 Applications for appointments as an Authorised Flight Examiner must be sponsored by the operator and submitted to the Authority.

1.6 Supervision of examiners

1.6.1 The conduct of tests by operators' examiners and of aircraft crew training will be periodically observed by competent officials.

1.7 Small operators

1.7.1 The arrangements discussed in the foregoing paragraphs may not be practicable in the case of a small organisation operating one or two aircraft and employing a small number of aircraft crew. In cases such as the periodical checking of the Authorised Flight Examiner himself, special arrangements may be agreed with the Authority.

1.8 Multi-type operation

1.8.1 Pilots and Flight Engineers shall be limited to operating one aircraft type or, where there are significant differences between variants of a type, to one variant.

1.8.2 Notwithstanding paragraph 1.8.1, the following classes of personnel may be allowed to operate more than one aircraft type or variant:

(a) Pilots and Flight Engineers Operating Simple Aircraft Types;

(b) Flight Instructors;

(c) Flight Examiners; Or

(d) Pilots Operating Under a Mixed Fleet Flying (MFF) Operation.

1.9 Use and approval of flight simulation training devices

1.9.1 Operators must ensure that adequate ground and flight training facilities, simulators and/ cockpit procedure training devices (fixed based simulator, computer-based training etc.) are available for the type of training required.

1.10 Records of training and tests

1.10.1 Records must be maintained showing a trainee's progress through each stage of training. These should indicate, where applicable, the number of times each exercise in base and line training was covered, and should include information about the results of tests. Records should incorporate certificates indicating the competence of examinees to perform the duties in respect of which they have been tested.

1.10.2 Operators must keep records for all aircraft crew members showing the dates on which tests, ratings, medical certificates, licences, etc. are due for renewal. There should also be an effective system to guard against aircraft crew being rostered for duty when checks, etc. are overdue, and for verifying that licences, etc. have been renewed at the appropriate time. The periods of validity of the various tests are:

(a) Type Rating Certificates of test (paragraph 1.5.1(b), and Bi-annual Proficiency checks (paragraphs 3.1.1(a), 3.3, 3.4, 5.1.2 and Chapter 8 in this document) shall be performed twice within any period of one year from the skill test with simulator or aircraft. Any two such checks which are similar and which occur within a period of four consecutive months shall not alone satisfy this requirement.

(b) Instrument Ratings test (paragraphs 1.5.1(c), 3.6 and Chapter 8 in this document, line checks (paragraphs 3.1.1, 3.2, 4.2 and 5.1.1)) and emergency/survival checks as detailed in Chapter 6 are valid for 12 months.

Note: *The proficiency check and line check requirements for flight crew approved for MFF operations can be found in Chapter 2, paragraph 23 of this document.*

2 TRAINING MANUALS

2.1 It is a statutory requirement in the Authority Announcement that a “training manual shall contain all such information and instructions as may be necessary to enable a person appointed by the operator to give or to supervise the training, experience, practice and periodical tests to perform his duties”.

2.2 Applicants for Air Operator Certificates are required to prepare a training manual and to submit a copy to the Authority, together with their application for approval. The manual will be regarded by the Authority as a primary indication of the standards of training and checking likely to be achieved. It should give formal expression to the operator's training policy and requirements, together with adequate guidance to instructors and examiners.

2.3 Each copy of a manual should normally bear a serial number, and a list of holders should be maintained by the person responsible for issuing amendments. Where this system is not used, an operator should have satisfactory alternative arrangements for controlling the issue and amendment of manuals. Each volume of a manual should be numbered and bear a title and list of contents giving a clear indication of its scope. The title of the person or department responsible for the issue of the manual should also be indicated. At the front of each volume there should be an amendment page to indicate amendment number, date of incorporation, signature or initials of persons amending, and page(s) or paragraph(s)

affected. Amended pages should be dated. The numbering of pages, sections, paragraphs, etc. should be orderly and systematic so as to facilitate immediate identification of any part of the subject matter. The standard of printing, duplication, binding, section dividers, indexing of sections, etc. should be sufficient to enable the document to be read without difficulty and to ensure that it remains intact and legible during normal use.

2.4 All proposed amendment to the contents in a Training Manual must be presented to the Authority for approval before inclusion in the manual. The amendment of a manual in manuscript will not be acceptable. Changes or additions, however slight they may be, should normally be incorporated by the issue of a fresh or additional page on which the amendment material is clearly indicated.

2.5 Although the training manual is a part of the operations manual it should be a separate volume addressed primarily to training staff, each of whom should normally have a personal copy. The form that the manual takes will vary considerably according to the size and complexity of the operator's organisation and the aircraft he/ she uses, and its adequacy will be assessed solely on the basis of its suitability for the operator's particular needs and circumstances.

2.6 The following matters should be covered in the manual normally in the volume addressed to training staff:

2.6.1 Requirements in respect of the qualifications, training and experience of training staff;

2.6.2 A comprehensive statement of the duties and responsibilities of all training staff, which should include their names, the type of training and/ or checking which they may conduct as an Appendix for timely amendment purposes, and the types of aircraft used by the operator;

2.6.3 Minimum standards of experience and of initial and periodical training to be met by all aircraft crew for each type of aircraft used by the operator;

2.6.4 Detailed syllabi and specimen record forms for all training and checking;

2.6.5 Arrangements for administering and recording the periodical tests of all aircraft crew;

2.6.6 Methods of simulating instrument flight conditions;

2.6.7 Methods of simulating engine failure;

2.6.8 Procedures for touch-and-go or stop-and-go landings, including flap settings, minimum runway lengths, brake cooling requirements and handling techniques;

2.6.9 Limitations on training and checking in the course of flights for the purpose of public transport. Note particularly that the simulation of instrument flight conditions and of emergencies affecting the flight characteristics of the aircraft is prohibited in the course of flights for the public transport of passengers;

2.6.10 Instructions covering rechecking and retraining after unsatisfactory performance or periods off flying due to illness or other causes;

2.6.11 The use of flight simulators; and

2.6.12 The assessment and training of crew in the use of Crew Resource Management and Human Factors.

2.6.13 The training of flight crew in the following areas:

(a) Proper flight crew coordination and training in all types of emergency and abnormal situations or procedures caused by engine, airframe or systems malfunctions, fire or other abnormalities;

(b) Avoidance of Controlled Flight into Terrain and policy for the use of the Ground Proximity Warning Systems (GPWS);

(c) Avoidance of collision and the use of the Airborne Collision Avoidance System (ACAS);

(d) Upset Prevention and Recovery Training; and

(e) Knowledge and skills related to visual and instrument flight procedures for the intended area of operation, charting, human performance including threat and error management and in the transport of dangerous goods.

Note: *1. Guidance on upset prevention and recovery training in a flight simulation training device can be found in the Manual on Aeroplane Upset Prevention and Recovery Training (Doc 10011)*

2. Procedures for the operation of ACAS are contained in PANS-OPS (Doc 8168), Volume I, and in PANS-ATM (Doc 4444), Chapters 12 and 15.

2.6.14 Operators, who wish to outsource initial, recurrent and conversion training, must ensure that the Authority approves the training courses. Approved training organisations or the equivalent that have State regulatory approval, may be accepted by the Authority to conduct training, however, courses still require the Authority approval. The qualification, training and approval of training and examining personnel utilised by an organisation, will normally be required to be approved by the Authority. The training provided and flight documentation used should reflect the operators' flight safety documents system.

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3 PERIODICAL TESTS - AEROPLANE PILOTS

3.1 General requirements

3.1.1 The operators shall subject their pilots to two separate but complementary tests:

(a) Line Check: A test of competence to perform his duties in the course of normal operations, including use of the instruments and equipment provided.

(i) Maximum period of validity for this test is stated in paragraph 1.10.2(b).

(ii) The line check shall be performed in the aircraft.

(iii) A pilot without a valid line check shall undergo an initial line check.

(b) Proficiency check: A test of competence to perform his duties in instrument flight conditions while executing emergency manoeuvres and procedures, including use of the instruments and equipment provided.

(i) The period of validity for this test is stated in paragraph 1.10.2(a).

(ii) The test shall conduct in a flight simulator specifically approved for this purpose, or in flight in actual or simulated instrument flight conditions approved by the Authority if a flight simulator is not readily available provided that the flight is not carrying any passenger or cargo.

3.1.2 These tests, namely Line Check and Proficiency check, shall be conducted by the following authorised persons:

(a) Line Check - to be conducted by an examiner appointed by the operator in accordance with the process referred to in paragraph 3.1.3, except for the initial line check which shall be conducted by an Authorised Flight Examiner; and

(b) Proficiency check - to be conducted by CAAT Inspector or an Authorised Flight Examiner.

3.1.3 For the purpose of paragraphs 3.1.1(a) and 3.1.2(a), the operator is to develop a process to appoint examiners for the conduct of Line Checks.

3.2 Line checks - all pilots

3.2.1 The annual line check is not intended to determine competence on any particular route. The requirement is for a test of ability to perform satisfactorily a complete line operation from start to finish, including pre-flight and post-flight procedures and use of the equipment provided. The route chosen shall be such as to give adequate representation of the scope of a pilot's operations.

3.2.2 The operator shall ensure that his pilots are competent to perform their duties. If the operator requires both the Pilot-in-Command and co-pilot to carry out either the pilot flying or the pilot monitoring duties, then both pilots shall be checked in both roles in accordance with the operator's procedures.

3.2.3 In addition to the above duties, a Pilot-in-Command shall also be assessed on his ability to manage the operation and take correct command decisions.

3.2.4 As the examiner may have to act as substitute for either Pilot-in-Command or co-pilot, the examiner shall be one who is fully qualified to operate at any crew station over which he/she acts in an examining capacity.

3.3 Proficiency checks - Pilots-in-Command

3.3.1 The Bi-annual Proficiency Check provides an opportunity for the practice of emergency drills and procedures which rarely arise in normal operations, and can generally be regarded as continuation training. The statutory requirement, however, is that pilots shall be tested, and their continued competence must be verified and certified.

3.3.2 The scope of the practice and check may be divided into three main categories, as follows:

(a) Emergency manoeuvres in instrument flight conditions, including:

(i) Take-off with engine failure between V_1 and V_2 or as soon as safety considerations permit. When the check is completed in an aircraft, instrument flight conditions should be simulated as soon as possible after becoming airborne;

(ii) Instrument approach to decision height with one engine inoperative;

(iii) "Go Around" on instruments from decision height with one or more engines inoperative;

(iv) Landing with one or more engines inoperative;

(v) Where appropriate to a particular aircraft type, approach and landing with flying control systems and/or flight director malfunctioning;

(vi) Where the emergency drills include action by the non-handling pilot, the check should additionally cover knowledge of these drills;

(b) Emergency procedures including, as appropriate:

(i) Engine fire;

(ii) Propeller or engine over speed;

(iii) Fuselage fire (pilot-operated system of control);

(iv) Engine failure before V_1;

(v) Emergency operation of undercarriage and flap;

(vi) Pressurisation failure;

(vii) Fuel dumping;

(viii) Engine relight;

(ix) Hydraulic failure;

(x) Electrical failure;

(xi) Malfunction of engine or engine control;

(xii) In the case of aircraft with two or more flight crew, coping with incapacitation of a member of the flight crew - this check should be carried out annually, i.e. on alternate proficiency checks;

(xiii) Action to be taken following an ACAS or GPWS or wind shear warning; and

(xiv) The avoidance of Controlled Flight into Terrain (CFIT) must be briefed and considered. The crew's situational awareness and recognition of their responsibility for terrain clearance despite conflicting ATC instructions must be emphasized during both the departure and arrival phases of the flight. The additional threats imposed by non-precision approaches must be covered. Some of these items will need to be covered by 'touch drills' and if the check is conducted in an aircraft (rather than in a simulator) they are normally best attended to on the ground.

(c) A supplementary questionnaire on technical matters and operating procedures which, although not falling within the category of emergencies, are matters on which pilots should be tested at regular intervals. Some of the items may equally well be covered in the course of a line check. Typical items to be covered include:

(i) Recognition and diagnosis of aircraft system faults for which there are no set drills;

(ii) Radio failure procedures;

(iii) Use of operations manuals including flight guides;

(iv) Familiarity with latest amendments to operations manuals, and latest issues of information circulars, and instructions to aircraft crew;

(v) Loading instructions;

(vi) Knowledge of internal and external check lists;

(vii) Aircraft equipment such as FMS, navigation systems, flight directors, weather radar, etc.;

(viii) Additional precautions for winter operations, anti-icing procedures and operations from contaminated runways;

(ix) Noise abatement procedures;

(x) Engine failure during stages of flight other than on take-off, especially critical stages such as during noise abatement, during a SID or flight over high ground, or during the approach.

On most of the larger modern aircraft the list of items that might usefully be discussed is likely to be extensive and examiners may prefer to deal with only a selection of items on a particular proficiency check. In this event the items covered should be recorded to assist examiners in covering the full list in the course of two or three successive checks.

Advantage should also be taken of the opportunity to give the pilots experience in the simulator of such rare occurrences as wind shear, flapless landing, dead stick landings etc.

3.4 Proficiency checks - Co-Pilots

3.4.1 It is especially important that co- pilots be checked in their own particular duties in the co-pilot's seat, including flying the aircraft for take-off and landing. Although there will be some difference in emphasis from the proficiency checks for Pilots-in-Command, the syllabus of the check should generally follow the pattern of that for Pilots-in-Command.

3.4.2 Pilots-in-Command who may be required to handle the aircraft from the co-pilot's seat should be checked in that seat. Provided such a Pilot-in-Command has completed a full left hand seat proficiency check, and it is still valid, the right hand seat proficiency check may be abbreviated to a minimum of:

(a) An engine failure on take-off;

(b) An asymmetric “go around” from decision height; and

(c) An asymmetric landing.

3.4.3 Where the normal flight crew complement provides for three pilots, with twos, taking turns at the Systems Panel/Engineer station, the Proficiency check should cover duties at both stations.

3.5 Proficiency checks - general considerations

3.5.1 Passengers may not be carried during proficiency checks. The checks are to be carried out on special training or positioning flights.

3.5.2 Intentional engine shutdown in an aircraft in flight is not permitted. For the purpose of meeting requirement of proficiency checks single engine operation must be simulated only.

3.5.3 Where both examiner and equipment are approved for the purpose, checks may be conducted in a flight simulator.

3.5.4 All exercises carried out should be properly recorded in the training’s report.

3.6 Instrument ratings - all pilots

3.6.1 The instrument rating test could be included in the proficiency checks and must be completed at intervals of not more than twelve months and should normally be carried out on the aircraft type on which the examinee is employed.

4 RETRAINING AND RECHECKING

4.1 Operators must ensure that training staff are adequately instructed on the action to be taken when unsatisfactory performance by a crew member, either during training or line operations, leads to rechecking or further training. For example, following an unsatisfactory proficiency check, a crew member should not be immediately subjected to a series of retests in the item(s) concerned until an acceptable standard is achieved. If the failure points to a fundamental weakness in ability or technique, adequate remedial training should be given before further checking.

4.2 If a crew member is found to be unsatisfactory during the course of line operations, the Captain should report the circumstances without delay and the crew member should be withdrawn from further duty until retraining and/or rechecking has been carried out. A record should be kept of any action taken.

5 PERIODICAL TESTS - FLIGHT ENGINEERS

5.1 The periodical tests for flight engineers should generally follow the pattern of those for Pilots-in-Command discussed in paragraphs 3.2 and 3.3 above omitting those items that are clearly appropriate only to pilots. The tests, which may be combined with the test requirements for licence purposes (see paragraph 1.5.1(a)), should include:

5.1.1 An annual assessment of a flight engineer's competence to perform his duties whilst executing normal manoeuvres and procedures in flight (line check), and

5.1.2 The bi-annual assessment of a flight engineer's competence to perform his duties whilst executing emergency procedures (proficiency check).

5.2 The tests as to the flight engineer's ability to carry out normal procedures must be carried out in the aircraft in flight. His ability to carry out emergency procedures may however be tested either in flight, or in a flight simulator specifically approved for this purpose.

5.3 These tests should normally be conducted by specially designated flight engineers. To the extent only that the test mentioned in paragraph 5.1.1 may take the form of an overall assessment of flight deck management and the performance of the flight crew as a whole, it may be conducted by specially designated flight instructors.

6 PERIODICAL TESTS - FLIGHT NAVIGATORS (IF APPLICABLE)

6.1 Operators proposing to use flight navigators as part of the operating flight deck crew should contact the Authority for advice on the requirements, at an early stage in their planning.

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7 AREAS, ROUTES AND AERODROMES COMPETENCE

7.1 Operators shall ensure that all flight crew members are familiar with the laws, regulations and procedures, and have the ability to speak and understand the language used for aeronautical radiotelephony communications pertinent to the performance of their duties, prescribed for the areas to be traversed, the aerodromes to be used and the air navigation facilities relating thereto. The operator shall ensure that all crew are familiar with such of these laws, regulations and procedures as are pertinent to the performance of their respective duties in the operation of the aircraft.

7.2 Operators shall ensure that all flight crew members meet the language proficiency requirements as specified in the ICAO Annex 1.

7.3 It is the Authority requirement that an Pilot-in-Command shall demonstrate to the satisfaction of the operator that he/ she has adequate knowledge of the route to be flown on each flight, aerodromes (including alternates), terrain and minimum altitudes, seasonal meteorological conditions, ATC communications and navigational facilities and procedures associated with the route along the route(s) and applicable procedures over heavily populated areas and areas of high traffic intensity, obstructions, physical layout, lighting, approach aids and arrival, departure holding and instrument approach procedures, and applicable operating minima, search and rescue procedures, facilities and procedures to be used (see Chapter 2 paragraph 10 in this documents). Certification (by the operator) of area and aerodromes competence is an annual requirement unless the Pilot-in-Command, after the initial certification, has flown over the area and aerodromes in the preceding twelve months.

7.4 Each Pilot-in-Command should be covered by a certificate of his competence in relation to each individual route and aerodrome, and operators involved mainly in scheduled services may find it convenient to adopt this procedure. The Authority may also agree to an alternative method of certification of Pilot-in-Command's route competence in relation to specified areas of operation or groups of routes.

7.5 If the alternative method is used, the operator must be aware that there may be a risk that a Pilot-in-Command, on the basis of his general experience, could be certified as competent to operate without restriction to an aerodrome which presents special problems and clearly requires route experience or special briefing however great the Pilot-in-Command's general experience may be. It is important, therefore, that the certificate issued by the operator should indicate positively the aerodromes to which the Pilot-in-Command is permitted to operate.

7.6 To avoid reproducing a long list of aerodromes in each Pilot-in-Command's area and airfields competence certificate, operators may find it convenient to maintain as part of the operations manual a list of "straight forward" aerodromes to which any experienced Pilot-in-Command could operate without restriction. For certification purposes, reference to the list would suffice. No aerodrome should be classified as unrestricted unless it is also included in the operator's flight guide and has an established instrument approach procedure.

7.7 Any aerodrome not included in the operator's unrestricted list, to which a Pilot-in-Command is considered competent to go, should be named in the certificate which should include a brief but clear indication of the manner in which competence has been established. To ensure consistency in certification, operators adopting the area method should also indicate in the manual the general nature of the special requirements to be met before a Pilot-in-Command can be considered competent at a "restricted" aerodrome. It is not practicable in this publication to specify in a manner appropriate to all circumstances the detailed requirements to be met before a Pilot-in-Command can be considered competent to operate to an aerodrome in a 'restricted' category. Ultimately the decision must rest on the good judgment and integrity of the operator and the measure of responsibility with which he/she approaches the problem.

7.8 The following are among the factors that operators may wish to take into account in deciding whether a Pilot-in-Command can be considered competent for a particular flight:

7.8.1 The imposition of special aerodrome operating minima (if operations are also confined to daylight) could in some circumstances render prior experience of the aerodrome unnecessary and enable the Pilot-in-Command to get aerodrome experience in the course of normal operations.

7.8.2 There are aerodromes at which a combination of special aerodrome operating minima, prohibition of night landings and special pre-flight briefing on local conditions could be considered adequate for a first visit;

7.8.3 In general, a Pilot-in-Command should not be considered competent to operate to an aerodrome at which nearby mountainous terrain makes the installation of an instrument approach aid impracticable, unless after an initial visit under supervision, he/ she has within the preceding twelve months flown there as Pilot-in-Command or Co-Pilot;

7.8.4 Competence to operate into a complex terminal area could sometimes, subject to acceptable general experience, be established in a flight trainer equipped for the purpose. If the complexity of ATC clearances and special characteristics of the local R/T were a factor, the use of tape recordings might be necessary.

7.8.5 In certain circumstances it may be permissible for an operator to base his decision that a Pilot-in-Command is competent for a particular flight on the fact that he/she will have a Co-Pilot with suitable general experience in addition to recent experience of the particular route and aerodrome. This procedure should be adopted only in exceptional circumstances, and the Co-Pilot concerned should be named in the certificate which should include details of his relevant experience;

7.8.6 A Pilot-in-Command whose experience is limited, say, to the Pacific and the Far East cannot be considered competent for flights in a completely different environment such as Europe or the North Atlantic.

7.9 The use of audio/visual means to familiarise Pilot-in-Command with aerodrome approaches may be approved.

7.10 If the operator relies in any particular instance on the verbal briefing of a Pilot-in-Command, it should be given by a person who is qualified to operate on the route in

question: The Pilot-in-Command should follow this by briefing his Co-Pilot before the flight commences.

7.11 All certificates raised in respect of a Pilot-in-Command's area and airfields competence must be signed on the operator's behalf by a qualified official of appropriate status.

7.12 In a small undertaking the chief pilot or other person in charge should know in detail the experience and general competence of each of his pilots and can be expected to arrange for special route familiarisation and to raise additional certificates where necessary. For larger organisations a system of control that does not depend upon personal knowledge will be necessary in order to prevent a Pilot-in-Command being rostered for a flight not covered by his certificate.

8 PILOTS-IN-COMMAND AND CO-PILOTS - INSTRUMENT APPROACH PROFICIENCY

8.1 A further separate requirement to be met in respect of the Pilot-in-Command and Co-Pilot is that they must have been tested (within the periods of validity stated in paragraph 1.10.2(a)) as to their proficiency in using instrument approach systems "of the type in use at the aerodrome of intended landing and any alternate aerodrome". The tests may be carried out in flight in actual or simulated instrument flight conditions, or in a simulator or flight trainer approved for the purpose.

8.2 To comply with this requirement, operators may find it convenient to ensure that Pilots-in-Command are tested as to their proficiency to carry out instrument approach procedures using all the pilot interpreted aids provided in the aircraft they operate. A separate test or record to cover the requirement may not be necessary, as it may be possible to meet the regulation in the course of instrument rating tests, bi-annual competence checks and routine line checks. (See paragraph 1.10.2.)

8.3 On many aircraft the interpretation of instruments is the same for VOR as for ILS. In these circumstances, provided there is a record of an initial test as to competence on a VOR approach and provided the pilot remains in regular practice at ILS approaches and enroute use of VOR, the separate annual VOR approach test may be dispensed with.

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9 PILOT'S RECENT TYPE EXPERIENCE

9.1 Unless the operator is granted approval to carry out MFF operations, the operator shall assign a flight crew member to function as a pilot or a co-pilot on a flight, only if he/she has, in the preceding 90 days, carried out at least three take-offs and landings in an aircraft or in an approved flight simulator of the type/class to be used on that flight.

9.2 Unless the operator is granted approval to carry out MFF operations, the operator shall assign a flight crew member to function as a cruise relief pilot in commercial air transport within the preceding 90 days, that person has either:

(a) Operated as Pilot-in-Command, Co-Pilot, or cruise relief pilot on the same type of aircraft; or

(b) Carried out flying skill recurrent training including normal, abnormal, and emergency procedures specific to cruise flight on the same type of aircraft or in an approved flight simulator, and has practiced approach and landing procedures, where the approach and landing procedure practice may be performed as the pilot who is not flying the aircraft.

Note: *The recent type experience requirements for flight crew approved for MFF operations can be found in chapter 2, paragraph 23 of this document.*

9.3 To regain recent type experience, a pilot or co-pilot shall undergo a flight training programme with a Type Rating Instructor:

(a) In a non-revenue training flight; or

(b) In an approved flight simulator of the same type/class.

The flight training programme shall be approved by the Authority.

10 FLIGHT ENGINEER'S RECENT TYPE EXPERIENCE

10.1 The operator shall not assign a flight crew member to function as a flight engineer unless he/she has, in the preceding 90 days, carried out at least one sector in an aircraft of the same type or in an approved flight simulator of the aircraft type to be used.

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11 FLIGHT CREW CONVERSION TRAINING

11.1 Syllabi

11.1.1 All type conversion training should be conducted in accordance with detailed syllabi included in the training manual. When considering programmes and syllabi for types of aircraft newly acquired, operators are urged to consult the Authority at the outset. The Authority will advise on the nature and scope of the training to be given, and early consultation will help to prevent difficulties and inconvenience to the operator when the syllabi is submitted for approval.

11.2 Minimum experience requirements

11.2.1 The standards for qualification and experience required of flight crew before being rostered for conversion training should be specified by the operator and agreed with the Authority.

11.3 Ground training

11.3.1 The operator should attach great importance to technical training and there should be a properly organised programme of ground instruction by competent tutors with adequate facilities, including any necessary mechanical and visual aids. If the aircraft concerned is relatively simple, private study may be adequate if the operator provides suitable manuals and/ or study notes. It is important that the time allowed for ground training should be devoted exclusively to that purpose and that trainees should not be taken away from their studies or for normal flying duties. Authorised Officers will wish to examine premises and equipment to be used for ground training. They are also authorised to be present while tuition and lectures are in progress.

11.4 Examinations and tests after ground training

11.4.1 Courses of ground instruction for flight crew should incorporate written progress tests at the end of each distinct phase.

11.4.2 For all flight crew, the ground course should cover the survival training as detailed in Chapter 6.

11.4.3 The annual “emergency/survival” test as detailed in Chapter 6 should be given before any flying training is started.

11.5 Flying training for pilots

11.5.1 For all pilots taking a conversion course, the flying training should be systematic and sufficiently comprehensive to familiarise them thoroughly with all aspects of normal operation of the aircraft, including the use of all flight deck equipment, and with all emergency drills, procedures, handling techniques and limitations. Pilots on conversion flying training should not be interrupted by flying other aircraft types.

11.5.2 The "flight handling" sections of the syllabus should include all the requirements of the appropriate type rating tests, and in addition the following items if appropriate to the aircraft type:

(a) Aeroplanes:

(i) Visual "Go Around" from not more than 200 ft AGL;

(ii) Failures of flight director system, including ILS approach without flight director;

(iii) A typical noise abatement procedure;

(b) Helicopters:

(i) Practice of appropriate type rating test items under instrument flight conditions including failure of flight instruments and flight directors;

(ii) Recovery from unusual attitudes under instrument flight conditions.

11.5.3 Each exercise should be practised until a satisfactory standard is achieved. The various take-off, "go around" and landing exercises should be performed at least twice. Records kept by the operator should show the number of times that each exercise was covered.

11.5.4 Particular emphasis should be placed on the practice of correct crew procedures for take-off, approach, landing and "go around", and additionally, for helicopter pilots, in the procedures for IMC descent enroute in conditions of low cloud and poor visibility.

11.5.5 Pilots undergoing conversion training should at some stage be given an exercise in coping with incapacitation of another flight crew member. If the flight crew complement includes a flight engineer it will be necessary for pilots to be sufficiently familiar with his in-flight functions.

11.6 Additional requirements for Pilots-in-Command

11.6.1 Without prejudice to any of the requirements of a particular type rating test, the conversion training of Pilots-in-Command should include the following items insofar as they may be appropriate to the aircraft type:

(a) Landing with two engines inoperative;

(b) Landing without flap or slat, or with restricted flap;

(c) Landing with flying control system malfunction;

(d) Instrument approach and "go around" with flight director malfunction;

(e) Landing at night with one engine inoperative;

(f) Crosswind take-off and landing.

11.6.2 Pilots-in-Command should also be given practice, normally in a simulator, in the stopping and starting of engines in flight and in any emergency drills that might fall to them while the Co-Pilot is handling the aircraft.

11.7 Additional requirements for co-pilots

11.7.1 Co-Pilots (in addition to the handling practice already referred to) should be given adequate training in the execution of all emergency drills that might fall to them while the Pilot-in-Command is flying the aircraft. Unless this is done in a flight simulator approved for the purpose it will be necessary for Co-Pilots to perform all drills (e.g. engine fire and relight) in flight where the flight instructor is flying the aircraft. Co-pilots should also be given practice, during conversion training, in the operation of all radio equipment and aircraft systems normally managed by the Co-Pilot while the Pilot-in-Command is handling the aircraft.

11.8 Checks after flying training

11.8.1 Before they are assigned to line duty in a pilot's seat (whether under supervision or not) Pilots-in-Command and Co-Pilots must be certified by the operator as competent in all the functions and duties covered by the relevant bi-annual proficiency check. Training in these functions and duties may not be completed in the course of normal operations. All conversion flying training must therefore incorporate the proficiency check described in paragraphs 3.3, 3.4 and 4.2 of this chapter.

11.8.2 Unless the aircraft, its handling characteristics and its flight instruments are closely similar to those of a type on which the pilot is already experienced, his conversion training should incorporate an instrument rating test on the new type. This will normally be expected to be part of a conversion programme, regardless of the expiry date of an existing instrument rating.

11.8.3 Before pilots are assigned to line duty as Pilots-in-Command or Co-Pilot, the operator shall certify, as a result of a check required by paragraph 3.2 or 4.2, that they are competent to execute normal manoeuvres and procedures under supervision. Before operating without supervision Pilots-in-Command and Co-Pilots must meet the full requirements of paragraph 3.2 or 4.2, as appropriate.

11.9 Flight under supervision

11.9.1 The conversion syllabus should provide for all pilots, after completion of flying training and initial tests, to operate a minimum number of sectors and/or flying hours “under supervision”. The minimum figures should be agreed with the Authority.

11.9.2 The “Under Supervision” period should NOT be used for the completion of the basic conversion syllabus. Its purpose is twofold. Firstly, it will enable the newly converted pilot to settle down to his duties on the new type in the company of an experienced and qualified pilot specially designated for the purpose, and to turn to him for advice if necessary. Secondly, it will enable the training staff to assess and verify the adequacy of the conversion training, and to ensure that proper operating standards are achieved at the outset, in the course of normal and varied operations.

11.9.3 "Under Supervision" means:

(a) for a Pilot-in-Command:

flying with an experienced pilot, qualified to act as the Pilot-in-Command and specially designated by the operator to act as a supervising pilot, who should occupy the seat and perform the duties of Co-Pilot. (Some operators may wish the newly converted Pilot-in-Command to operate a few sectors in the Co-Pilot's seat and this is acceptable if the supervising captain is in the Pilot-in-Command's seat);

(b) for a Co-Pilot:

flying in the Co-Pilot's seat with either:

(i) A qualified Pilot-in-Command, specially designated for the purpose, occupying the Pilot-in-Command's seat, or

(ii) any qualified pilot-in-command in the pilot-in-command's seat and a supervisory First Officer specially designated for the purpose, occupying an additional crew seat in the flight deck.

11.9.4 On completion of the sectors under supervision a line check should be administered.

11.9.5 The "Under Supervision" sectors carried out by a newly qualified Captain will have been completed with an experienced supervisory captain acting as Co-Pilot. Some operators may therefore wish to carry out a further period of flying, after the line check referred to a paragraph 11.9.4, teaming the new Captain with a standard crew, and with a suitably qualified pilot, specially designated for the purpose, occupying the jump seat and acting only in an advisory capacity. It should be made clear that in this situation the newly qualified Captain is the Pilots-in-Command of the aircraft.

11.9.6 If the flight crew complement includes a pilot acting as a systems panel operator, he/she should, after conversion training and the initial test in these duties, operate a minimum number of sectors under the supervision of a qualified and specially designated person carried in addition to the flight crew of the aircraft.

11.10 Use of flight simulators for conversion training

11.10.1 The extent to which a flight simulator may be used for conversion/ recurrent/ recency training will be considered according to individual circumstances as approved by the Authority.

11.11 Flight engineers

11.11.1 Type conversion for flight engineers should follow the same general pattern as that of pilots. Newly trained flight engineers should not occupy the flight engineer's seat during take-off and landing on a public transport flight until they have completed all initial competence checks.

11.11.2 Flight engineers should operate a minimum number of sectors under the supervision of a suitably qualified and specially designated flight engineer. A line check report should be made on completion of the sectors under supervision.

11.11.3 Flight engineers undergoing conversion training should at some stage be given an exercise in coping with incapacitation of another flight crew member.

11.12 Variants of the same aircraft type

11.12.1 A company may operate a number of aircraft which, though of the same type, are not identical. They may differ in engines, systems, equipment, flight deck lay-out, operating procedures, performance, or in other respects. In such circumstances the operator must conduct a "differences course" for his crew to ensure they are adequately trained on each variant.

12 CONVERSION FROM FIRST OFFICER TO PILOT-IN-COMMAND

12.1 It is essential that promotion to Pilot-in-Command should be preceded by a planned "conversion" course, including up-grading of the type endorsement if necessary. An adequate number of sectors must be flown in the appropriate seat as Pilot-in-Command under supervision. There should be a full Pilot-in-Command's base and line check immediately before appointment.

13 SAFETY AND EMERGENCY PROCEDURES (SEP)

13.1 The Emergency and Survival Training, Practice and Training Requirements for flight crew and cabin crew are contained in Chapter 6 of this document.

14 TRAINING ON SPECIAL EQUIPMENT

14.1 Formal training should be given to aircraft crew as necessary on items of special equipment such as storm warning radar, flight director systems, auto-pilots, LORAN, Doppler, Inertial Navigation/Reference System, Global Positioning System, Communications-Navigation-Surveillance (CNS) / Air Traffic Management (ATM) systems and head-up display and/or enhanced vision system for those aircraft so equipped.

15 FLIGHT OPERATIONS OFFICER/FLIGHT DISPATCHER AND GROUND STAFF TRAINING AND CHECKING

15.1 The operator shall provide training for ground staff directly involved with flight operations (including flight operations officers/ flight dispatchers), in particular those employed in operations and traffic departments. The operator shall ensure that the flight operations officer/flight dispatcher demonstrates that he/she has the knowledge; and that he/she

maintains familiarisation with all features of the operation which are pertinent to such duties, including the knowledge and skills related to human performance. Further training will be necessary from time to time (e.g. when new types of aircraft are acquired) and the arrangements in this connection will be taken into account in the consideration of applications for the variation of certificates.

15.2 The detailed requirements for Flight Operations Officers/Flight Dispatchers and Flight Dispatcher Instructor can be found in Appendix D of this document.

16 DANGEROUS GOODS TRAINING FOR OPERATORS

16.1 An operator shall establish and maintain staff training programmes, as required by the ICAO Technical Instructions Part 1 Chapter 4. These training programmes shall be approved by the Authority.

16.2 An operator shall ensure that all staff who are competent to perform any function for which they are responsible prior to performing any of these functions. This must be achieved through training and assessment commensurate with the functions for which they are responsible. Such training must include:

(a) General awareness/familiarization training - Personnel must be trained to be familiar with the general provisions;

(b) Function-specific training - Personnel must be trained to perform competently any function for which they are responsible; and

(c) Safety training - Personnel must be trained on how to recognize the hazards presented by dangerous goods, on the safe handling of dangerous goods, and on emergency response procedures.

16.3 An operator shall ensure that all staffs have received training but who are assigned to new functions must be assessed to determine their competence in respect of their new function. If competency is not demonstrated, appropriate additional training must be provided.

16.4 An operator shall ensure that all staffs must be trained to recognize the hazards presented by dangerous goods, to safely handle them and to apply appropriate emergency response procedures.

16.5 An operator shall ensure that all staff must receive recurrent training and assessment within 24 months of previous training and assessment to ensure that competency has been maintained. However, if recurrent training and assessment is completed within the final three months of validity of the previous training and assessment, the period of validity extends from the month on which the recurrent training and assessment was completed until 24 months from the expiry month of that previous training and assessment.

16.6 An operator shall ensure that records of dangerous goods training and assessment are maintained for all staff trained and shall include the following;

(a) The individual's name;

(b) The month of completion of the most recent training and assessment;

(c) A description, copy or reference to training and assessment materials used to meet the training and assessment requirements;

(d) The name and address of the organization providing the training and assessment; and

(e) Evidence which shows that the personnel have been assessed as competent.

16.7 The records of training and assessment must be retained by the employer for a minimum period of 36 months from the most recent training and assessment completion month and must made available upon request by the Authority.

16.8 Instructor qualifications and competencies

(a) Instructors of initial and recurrent dangerous goods training must demonstrate or be assessed as competent in instruction and the function(s) that they will instruct prior to delivering such training.

(b) Instructors delivering initial and recurrent dangerous goods training must deliver such courses at least every 24 months, or in the absence of this, attend recurrent training.

17 AVIATION SECURITY TRAINING

17.1 The operator shall establish, maintain and conduct approved training programmes which enable the operator's personnel to take appropriate action to prevent acts of unlawful interference such as sabotage or unlawful seizure of aeroplanes and to minimise the consequences of such events should they occur.

17.2 The training programme shall include at least the elements identified in the National Civil Aviation Security Training Programme for Kingdom of Thailand (ASTP). Such training programmes shall be periodically reviewed to ensure that it is kept abreast with the latest developments.

17.3 The operator shall also establish and maintain a training programme to acquaint appropriate employees with preventive measures and techniques in relation to passengers, baggage, cargo, mail, equipment, stores and supplies intended for carriage on an aeroplane so that they contribute to the prevention of acts of sabotage or other forms of unlawful interference.

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18 REQUIREMENTS OF EXPERIENCE, RECENCY, AND TRAINING APPLICABLE TO SINGLE PILOT OPERATIONS UNDER IFR OR AT NIGHT

18.1 As required under Chapter 2, Paragraph 2.5, all aeroplanes operated by a single pilot under IFR or at night in addition to performance requirements promulgated in AOCR Appendix M, shall also satisfy the following requirements:

(a) The operator shall include in the Operations Manual a pilot's conversion and recurrent training programme which includes the additional requirements for a single pilot operation;

(b) In particular, the cockpit procedures must include:

(i) Engine management and emergency handling;

(ii) Use of normal, abnormal and emergency checklists;

(iii) ATC communication;

(iv) Departure and approach procedures;

(v) Autopilot management; and

(vi) Use of simplified in-flight documentation.

(c) The recurrent checks required by the Authority Announcement regarding Flight Crew Training Programme, shall be performed in the single-pilot role on the type or class of aeroplane in an environment representative of the operation;

(d) The Pilot-in-Command shall have a minimum of 50 hours' flight time on the specific type or class of aeroplane under IFR of which 10 hours is as Pilot-in-Command;

(e) The minimum requirement recent experience for a pilot engaged in a single-pilot operation under IFR or at night shall be 5 IFR flights, including 3 instrument approaches, carried out during the preceding 90 days on the type or class of aeroplane in the single-pilot role. This requirement may be replaced by an instrument approach check on the type or class of aeroplane; and

(f) The Pilot-in-Command has successfully completed training programmes that include passenger briefing with respect to emergency evacuations, autopilot management, and the use of simplified in-flight documentation.

19 FLIGHT CREW TRAINING AND CHECKING FOR OPERATIONS AT NIGHT AND/OR IMC BY SINGLE ENGINE TURBINE-POWERED AEROPLANE

19.1 The minimum flight crew experience required for night/ IMC operations by single engine turbine-powered aeroplanes shall be as prescribed in paragraph 18.1(d) and 18.1(e) above.

19.2 An operator's flight crew training and checking shall be appropriate to night and/or IMC operations by single engine turbine-powered aeroplanes, covering normal, abnormal and emergency procedures and, in particular, engine failure, including descent to forced landing in night and/or in IMC conditions.

20 VIRTUAL CLASSROOM TRAINING

20.1 To conduct the theoretical parts of training according to the applicable training program/syllabus in a virtual classroom training, the air operators or the training providers should perform a risk assessment with carefully evaluations. The Guidance Material for Virtual Classroom Training also provide the guidance on designing, developing and using digital learning for virtual classroom training.

Note: See CAAT Guidance Material for Virtual Classroom training.

CHAPTER 5

ORGANISATION AND FACILITIES

1 MANAGEMENT AND EXECUTIVE STAFF

1.1 A sound and effective management structure is essential. It is particularly important that the operational management should have proper status in the organisation and be in suitably experienced and competent hands. The duties and responsibilities of managers, senior executives and designated representatives in charge of operational control must be clearly defined in writing, and chains of responsibility firmly established. The number and nature of the appointments may vary with the size and complexity of the organisation. An excess of managers can lead to fragmentation of responsibility and control, and to as much difficulty and inefficiency as a shortage and a lowering of operational standards can as easily result. In general, the appointment of deputies for managerial posts should be kept to a minimum and particular care should be taken in defining their functions and responsibilities. Before an AOC can be granted, the Authority must be satisfied that the management organisation of the operator is adequate and properly matched to the operating network and commitments.

1.2 The positions held by key personnel will be listed in each Air Operator Certificate, and it will be a condition of the Certificate that the Authority shall be given advance notice of any intended change in appointments or functions.

1.3 The operator shall appoint an accountable manager, who has the authority for ensuring that all activities can be financed and carried out in accordance with the applicable requirements. The accountable manager shall be responsible for establishing and maintaining an effective management system.

1.4 A person or group of persons shall be nominated by the operator, with the responsibility of ensuring that the operator remains in compliance with the applicable requirements. Such person(s) shall be ultimately responsible to the accountable manager.

1.5 The operator shall have sufficient qualified personnel for the planned tasks and activities to be performed in accordance with the applicable requirements.

1.6 The operator shall maintain appropriate experience, qualification and training records to show compliance with the aforementioned tasks and activities in paragraph 1.5.

1.7 The operator shall ensure that all personnel are aware of the applicable laws, regulations and procedures relevant to the exercise of their duties.

1.8 The person may hold more than one of the nominated posts if such an arrangement is considered suitable and properly matched to the scale and scope of the operation:

(a) The acceptability of a single person holding several posts, possibly in combination with being the accountable manager, should depend upon the nature and scale of the operation. The two main areas of concern should be competence and an individual's capacity to meet his/her responsibilities;

(b) As regards competence in different areas of responsibility, there should not be any difference from the requirements applicable to persons holding only one post;

(c) The capacity of an individual to meet his/her responsibilities should primarily be dependent upon the scale of the operation. However, the complexity of the

organisation or of the operation may prevent, or limit, combinations of posts which may be acceptable in other circumstances;

(d) In most circumstances, the responsibilities of a nominated person should rest with a single individual. However, in the area of ground operations, it may be acceptable for responsibilities to be split, provided that the responsibilities of each individual concerned are clearly defined.

2 ADEQUACY AND SUPERVISION OF PERSONNEL

2.1 Adequacy and Competency of Personnel

2.1.1 The operator shall employ sufficient personnel for the planned ground and flight operations.

2.1.2 All personnel assigned to, or directly involved in, ground and flight operations shall:

(a) Be properly trained;

(b) Demonstrate their capabilities in the performance of their assigned duties; and

(c) Be aware of their responsibilities and the relationship of their duties to the operation as a whole.

2.2 Supervision of Personnel

2.2.1 The operator shall appoint a sufficient number of personnel supervisors, taking into account the structure of the operator's organisation and the number of personnel employed.

2.2.2 The duties and responsibilities of these supervisors shall be defined, and any other necessary arrangements shall be made to ensure that they can discharge their supervisory responsibilities.

2.2.3 The supervision of crew members and personnel involved in the operation shall be exercised by individuals with adequate experience and the skills to ensure the attainment of the standards specified in the operations manual.

2.3 Aircraft Crew

2.3.1 It will be necessary for operators to satisfy the Authority they have a sufficient number of aircraft crew for the operations to be undertaken. The adequacy of the aircraft crew will not be assessed against a set formula, as there will clearly be a wide variation in requirements according to particular circumstances, though it will be expected that even if only one aircraft is to be operated a minimum of two properly qualified aircraft crews will be employed. In certain cases, where the volume of work undertaken is small the normal requirement concerning the number of aircraft crew employed may be relaxed. It is important, that all grades of aircraft crew should be employed full-time under a suitable service contract. The employment of part time or "freelance" aircraft crew will not be acceptable except in exceptional circumstances and with the approval of the Authority.

2.3.2 Flights over routes for which a flight navigator is required will not normally be permitted unless the operator has the full-time services of a sufficient number of fully qualified and licensed Flight Navigators. If the operations are on a very small scale, one navigator may be sufficient. If the introduction of advanced pilot operated navigation aids is considered to render the carriage of a licensed Flight Navigator unnecessary for a particular route, then application to operate such a route without a licensed Flight Navigator may be submitted to the Authority and will be considered on its merits.

2.3.3 Suitable arrangements must be made for the supervision of all grades of aircraft crew by persons having the experience and qualities necessary to ensure the maintenance of high professional standards. This will necessitate such appointments as Chief Pilot, Flight or Fleet Manager and in the larger organisations - Chief Navigator, Chief Flight Engineer and Chief Cabin Crew. The duties and responsibilities of these officials should be carefully defined, and their line flying commitments suitably restricted in order that they may have sufficient time for their managerial functions.

2.3.4 Operators must ensure that their crew shall NOT exercise the privileges of their licences at any time when they are aware or have been told by competent medical authority, of any decrease in their medical fitness which might render them unable to safely exercise those privileges. Such decrease in fitness shall be reported immediately to the Authority.

2.4 Ground Staff

2.4.1 The number of staffs needed will depend primarily upon the nature and the scale of the operator's operation. The operations and traffic departments, in particular, shall be adequately staffed with trained personnel who have a complete understanding of the nature of their duties and responsibilities. Operators shall provide any further training that may be necessary from time to time (e.g. when new types of aircraft are acquired) and the arrangements in this connection will be taken into account in the consideration of applications for the variation of Certificates.

3 FACILITIES

3.1 The nature and scale of office services required administrative staff and office equipment etc. should be related to the numbers of executive and other staff employed. It is particularly important that office services are sufficient to ensure that operational instructions and information of all kinds are produced and circulated to all concerned without delay.

3.2 In cases where the provisions of printing facilities for manuals, manual amendments and other necessary documentation is not warranted by the size of the company, the operator must show that he/she has efficient alternative arrangements.

3.3 The operator should make use of appropriate ground handling facilities to ensure the safe handling of its flights, arrange operational support facilities at the operating base, appropriate for the area and type of operation and ensure that the available working space at each operating base is sufficient for personnel whose actions may affect the safety of flight operations.

3.4 Consideration shall be given to the needs of ground staff, personnel concerned with operational control, the storage and display of essential records and flight planning by crews.

4 ACCOMMODATION

4.1 Office space at each operating base/ line station must be sufficient to provide a suitable working environment for the operating staff employed. Adequate provision must be made for the traffic staff, for operational planning, for the storage and display of essential records, and for flight planning by flight crew. If flight planning facilities for flight crew are provided by the airport authority, handling agents, the space provided by the operator can normally be reduced, but it is essential that reasonable accommodation should be made available for aircraft crew to use before and between flights.

5 OPERATIONS LIBRARIES

5.1 At each operating base/line station the operator should maintain an adequate and appropriate library of maps, charts, flight guides, operations manuals and other documents needed for reference and planning purposes, and for carriage in flight. The library should be kept in an orderly fashion and responsibility for its maintenance clearly defined.

5.2 Maps, charts, and flight guides held should cover the whole of the region for which the operator is, or wishes to be, certificated.

5.3 Arrangements should be made for the amendment of manuals, flight guides etc., and for bringing the amendments to the notice of aircraft crews and other operating staff concerned. A record should be kept of the distribution of manuals and amendments.

6 AIRCRAFT LIBRARY AND NAVIGATION BAG

6.1 There shall be an effective system to ensure that aircraft are provided with an adequate and updated library of manuals, maps and charts, flight guides checklists and other necessary documents, including data in electronic form, supported by an efficient amendment service. Content lists should be provided for making up the aircraft library and navigation bag, and aircraft drill cards should include an item requiring libraries and navigation bags to be checked before departure.

7 FLIGHT STAFF INSTRUCTIONS

7.1 Flight manuals, operations manuals, and other standing instructions must be supplemented by a systematic procedure for bringing urgent or purely temporary information to the notice of aircraft crews. This should be achieved by a numbered series of flight staff instructions or crew notices issued by or under the direct authority of a senior operations official. When the issue of such a temporary instruction entails amendment of a standing instruction, the amendment should be made without undue delay and periodical checklists should be issued to show which of the temporary instructions are current. Full use should be made of these instructions to bring significant Aeronautical Information Circulars, NOTAM, changes in aerodrome operating minima, etc. to the attention of aircraft crew.

8 REGULATIONS AND AERONAUTICAL INFORMATION

8.1 All flight crew, and other operating staff who may be concerned, should have access at their normal operating base to:

(a) Thailand AIP;

(b) The Thailand Regulatory Requirement currently in force and any amendments thereto;

(c) NOTAM; in particular affecting facilities over the routes, destination, enroute alternates and diversion;

(d) Aeronautical Information Circulars; and

(e) Flight rules of the State of the Aerodrome and the requirement to comply with these rules.

8.2 Where this information is readily available to crew in an Aeronautical Information Service unit, it may not be necessary for the operator to duplicate the service, but it is nevertheless his responsibility to ensure that the information is available.

8.3 If the normal operating base/line station is abroad, the local Aeronautical Information Publication, NOTAM and appropriate manuals shall be provided. This will be agreed with the Authority.

8.4 Operators shall ensure that all employees when abroad know that they must comply with the laws, regulations and procedures of those States in which operations are conducted.

9 OCCURRENCE AND FLIGHT SAFETY REPORTS

9.1 Responsibility for co-ordinating action on occurrence reports, mandatory or otherwise, and for initiating any necessary investigations should be assigned to a suitably qualified senior officer with clearly defined authority and status. Reports should be made to the Authority or local civil aviation authority through this officer by email (safetyreport@caat.or.th) or Thailand's Aviation Safety Occurrence Reporting Portal (www.caat.or.th/occurrence), in accordance with the timelines set out in The Civil Aviation Authority of Thailand Requirement No.22 on "Reporting of Civil Aviation Occurrences".

9.2 Particular care should be taken to ensure that the originators of flight safety reports are informed of the action taken, and where it would be useful in the interest of safety the circumstances of the incident should be made generally known within the operator's organisation.

10 SAFETY MANAGEMENT SYSTEM

10.1 The operator shall implement a safety management system acceptable to the Authority that is based on the ICAO Doc 9859 Safety Management Manual and:

(a) Identifies safety hazards and assesses, controls and mitigates risks;

(b) Ensures the implementation of remedial actions necessary to maintain the agreed safety performance;

(c) Provides for continuous monitoring and regular assessment of the safety performance achieved;

(d) Aims to make continuous improvement to the overall safety performance of the safety management system; and

(e) Identifies quality management system and emergency response planning.

10.2 The framework for the implementation and maintenance of a safety management system should include, as a minimum, the following 4 components and 12 elements:

1 Safety Policy and Objectives

1.1 Management Commitment and Responsibility

1.2 Safety Accountabilities

1.3 Appointment of Key Safety Personnel

1.4 Coordination of Emergency Response Planning

1.5 SMS Documentation

2 Safety Risk Management

2.1 Hazard Identification

2.2 Safety Risk Assessment and Mitigation Processes

3 Safety Assurance

3.1 Safety Performance Monitoring and Measurement

3.2 Management of Change

3.3 Continuous Improvement of The SMS

4 Safety Promotion

4.1 Training and Education

4.2 Safety Communication

Note:- *Guidance for the Safety Management Manual can be found in the Safety Management Manual (Doc9859).*

10.3 A safety management system shall clearly define lines of safety accountability throughout the organisation, including direct accountability for safety on the part of senior management.

10.4 Training and Communication On Safety

10.4.1 Training

(a) All personnel should receive safety training as appropriate for their safety responsibilities.

(b) The emergency response plan training and exercise should be provided to the responding personnel as appropriate to their responsibilities, roles and actions for the various agencies and personnel involved in dealing with specific emergencies.

(c) Recurrent training for safety and emergency response plan (ERP) should be provided on regular basis. The coordination of ERP should be exercised as part of the periodic testing of ERP.

(d) Adequate records of all safety training provided should be kept.

10.4.2 Communication

10.4.2.1 The operator should establish communication about safety matters that:

(a) Ensures that all personnel are aware of the safety management activities as appropriate for their safety responsibilities;

(b) Conveys safety critical information, especially relating to assessed risks and analyzed hazards;

(c) Explains why particular actions are taken; and

(d) Explains why safety procedures are introduced or changed.

10.4.2.2 Regular meetings with personnel where information, actions and procedures are discussed may be used to communicate safety matters.

10.5 Flight Data Analysis Program

The operator shall establish and maintain a flight data analysis program as part of its safety management system. The flight data analysis program shall be non-punitive and contain adequate safeguards to protect the source(s) of the data

10.6 Flight Safety Documents System

10.6.1 The operator shall establish a flight safety documents system, for the use and guidance of operational personnel, as part of its safety management system.

10.6.2 The development of a flight safety documents system is a complete process, and changes to each document compromising the system may affect the entire system. The operational documents are to be consistent with each other, and consistent with current regulations, manufacturer requirements, and Human Factors principles. It is also necessary to ensure consistency across departments as well as consistency in application. Hence, the emphasis on an integrated approach, based on the notion of the operational documents as a complete system.

10.6.3 The guideline is provided in Appendix K and it addresses the major aspects of the operator's flight safety documents system development process. The guidelines are

based not only upon scientific research, but also upon current best industry practices, with an emphasis on a high degree of operational relevance.

11 FLIGHT PREPARATION AND OPERATIONAL FLIGHT PLANS

11.1 Flight Preparation

11.1.1 A flight shall not be commenced until flight preparation forms have been completed certifying that the Pilot-in-Command is satisfied that:

(a) The aeroplane is airworthy and the appropriate certificates (i.e. airworthiness, registration) are on board the aeroplane;

(b) The instruments and equipment for the particular type of operation to be undertaken, are installed;

(c) A maintenance release as prescribed in Chapter 9, paragraph 7.5.2 has been issued in respect of the aeroplane;

(d) The mass of the aeroplane and centre of gravity location are such that the flight can be conducted safely, taking into account the flight conditions expected;

(e) Any load carried is properly distributed and safely secured;

(f) A check has been completed indicating that the operating limitations of Chapter 5 can be complied with for the flight to be undertaken; and

(g) The Standards of paragraph 11.3 relating to operational flight planning have been complied with.

11.1.2 A flight to be operated in known or expected icing conditions shall not be commenced unless the aeroplane is certificated and equipped to cope with such conditions. A flight to be planned or expected to operate in suspected or known ground icing conditions shall not take off unless the aeroplane has been inspected for icing and, if necessary, has been given appropriate de-icing/anti-icing treatment. Accumulation of ice or other naturally occurring contaminants shall be removed so that the aeroplane is kept in an airworthy condition prior to take-off.

Note:- *Guidance material is given in the Manual of Aircraft Ground De-icing/Anti-icing Operations (Doc 9640).*

11.2 ATS Flight Plans

11.2.1 The operator shall complete and file to the appropriate ATS unit an ATS flight plan for each intended flight. Such ATS flight plan shall be approved and signed by the Pilot-in-Command, and, where applicable, the flight operations officer/flight dispatcher. A copy shall be kept by the operator or designated agent.

11.2.2 Operational instructions involving a change in the ATS flight plan, when practicable, be coordinated with the appropriate ATS unit before transmission to the aeroplane.

Note:- *When the above coordination has not been possible, operational instructions do not relieve a pilot of the responsibility for obtaining an appropriate clearance from an ATS unit, if applicable, before making a change in flight plan.*

11.3 Operational Flight Plans

11.3.1 The operator shall complete an operational flight plan for each intended flight, and supply for the use of the flight crew operational flight plan forms or prepared flight plan/logs to be used on all flights. The operational flight plan is the operator's plan for the safe conduct of the flight based on considerations of aircraft performance, other operating limitations and relevant expected conditions on the route to be followed and at the aerodromes (or heliports, as appropriate) concerned. The operational flight plan shall be approved and signed by the Pilot-in-Command, and where applicable, the flight operations officer/flight dispatcher. A copy of the operational flight plan shall be filed with the operator or a designated agent, and left on record in a suitable place at the point of departure. The following entries shall be provided for:

(a) Name of flight deck crew;

(b) Flight number (or other designation), date, aircraft type and registration;

(c) Names of reporting and turning points together with coding and frequencies of radio aids;

(d) Tracks and Distances;

(e) Flight times between reporting and turning points;

(f) ETA, revised ETA and ATA at each reporting and turning point;

(g) Minimum Safe Altitude for each stage of the flight;

(h) Altimeter settings at points of departure and destination;

(i) Cleared cruising altitudes or flight levels;

(j) Destination alternate aerodrome and en route alternate aerodromes for extended range operations by aeroplanes with two engines (ETOPS);

(k) EDTO; RVSM; MNPS; RNP; RNAV

(l) Information from meteorological broadcasts;

(m) A brief and simple statement of the fuel requirement and the manner in which it was computed (e.g. Three figures - fuel to destination, fuel for diversion and holding, fuel for contingencies and total fuel - would suffice);

(n) If not maintained separately, a fuel log in which to record in-flight fuel checks;

(o) Space for noting ATC clearances; and

(p) Taxi, airborne, landing and engine-off times.

11.3.2 Operators shall ensure that the forms are properly completed for each flight and retained for a period of at least three months.

11.3.3 For scheduled journeys it is desirable that operators should use a prepared navigational flight plan on which tracks, distances, minimum safe altitudes, etc. are printed. Special precautions will be necessary, of course, to ensure that amendments are incorporated as they become effective.

11.4 Journey Log Book

11.4.1 Particulars of the aircraft, its crew and each journey shall be retained for each flight, or series of flights, in the form of a journey log, or equivalent.

11.4.2 "Journey log or equivalent" means that the required information may be recorded in documentation other than a log book, such as the operational flight plan or the aircraft technical log.

11.4.3 The aircraft journey log, or equivalent, should include the following items, where applicable:

(a) Aircraft nationality and registration;

(b) Date;

(c) Name(s) of crew member(s);

(d) Duty assignments of crew member(s);

(e) Place of departure;

(f) Place of arrival;

(g) Time of departure;

(h) Time of arrival;

(i) Hours of flight;

(j) Nature of flight (scheduled or non-scheduled);

(k) Incidents, observations, if any;

(l) Signature of person in charge.

11.4.4 Entries in the journey log book should be made currently and in ink or indelible pencil. The information, or parts thereof, may be recorded in a form other than on printed paper. Accessibility, usability and reliability should be assured and completed journey log book should be retained to provide a continuous record of the last six months' operations.

11.5 Voyage Reports/Records

11.5.1 The Operator shall maintain a Report/Record for all flights undertaken. The Voyage Report/Record shall be completed by the Pilot-in-Command of the flight and retained

by the operator for a period of at least 6 months. The Voyage Report/Record shall include the following information:

(a) Names of all crew, their duty assignments and in-flight rest times (as applicable);

(b) Details of the flight undertaken, such as date, flight number; and

(c) Significant times of the flight such as pushback, taxi, take off, landing and chocks on.

Note:- *All times shall be in UTC.*

11.5.2 The Voyage Report/Record shall be signed by the Pilot-in-Command of the flight who shall be responsible for the accuracy of the data entered thereon. All entries shall be made in indelible ink or indelible pencil.

11.6 Records of Emergency and Survival Equipment Carried

11.6.1 The operator shall have available for immediate communication to rescue co-ordination centres lists containing information on the emergency and equipment carried on board any of their aircraft engaged in international air navigation. The information shall include, as applicable, the number, color and type of life rafts and pyrotechnics, details of emergency medical supplies, water supplies and the type and frequencies of the emergency portable radio equipment.

12 PILOT-IN-COMMAND'S FLIGHT BRIEFS

12.1 For flights on routes not normally flown, Pilots-in-Command must be provided with a suitable brief, a copy of which should be retained by the operator for at least three months. The brief should include guidance on the schedule to be maintained and on all operational aspects of the voyage not fully covered in the operations manual - including in particular details of the routes to be flown, specific aerodrome operating minima for all aerodromes (including alternates) likely to be used, and details of the navigation and terrain clearance procedures to be used.

13 NAVIGATION

13.1 Operators will be expected to supply, for the use of flight crews, navigation flight plan forms or prepared flight plan/logs to be used on all flights, except those sectors flown both regularly and of less than 45 minutes duration in Visual Meteorological Conditions (VMC) within a radius of 50 nm of the aerodrome and helicopter flights on-shore in VMC. The following entries in particular should be provided for:

(a) Names of flight crew;

(b) Flight number or other designation, date, aircraft type and registration;

(c) Names of reporting and turning points together with coding and frequencies of radio aids; latitude and longitude should be included, if use is to be made of navigation systems;

(d) Tracks and distances between reporting and turning points; tracks should be magnetic, unless true or grid are more appropriate to the nature of the flight, and designated magnetic, true or grid as required;

(e) Route winds where appropriate;

(f) Flight times between reporting and turning points;

(g) ETA, revised ETA and ATA at each reporting and turning point;

(h) Minimum safe altitude for each stage of the flight;

(i) Cleared cruising altitudes or flight levels;

(j) A brief and simple statement of the fuel requirement and the manner in which it was computed e.g. Sector fuel, alternate fuel, contingency fuel and holding fuel, all shown separately;

(k) Altimeter settings at point of departure and destination;

(l) Airfield information used in performance calculations;

(m) Information from meteorological broadcasts;

(n) If not maintained separately, a fuel log in which to record the in-flight fuel checks;

(o) Space for noting ATC clearances; and

(p) Taxi, airborne, landing and engine-off times.

13.2 Operators should ensure that the forms are properly completed for each flight.

13.3 Operators should ensure that detailed instructions are specified on procedures to be adopted in setting up navigation systems. Such information should include:

(a) Initialisation procedures;

(b) Comparison of standard routes against flight plans;

(c) Insertion of random routes;

(d) Cross-checking of random route waypoints, tracks and distances;

(e) Accuracy checks prior to entering areas where on-board navigation equipment cannot be monitored by external sources;

(f) Gross navigation error checks;

(g) Checks to be carried out after re-programming in flight; and

(h) Procedures to be followed in the event of navigation system failures.

14 GROUND HANDLING OPERATIONS

14.1 The operator shall establish an organisational structure which includes the safety accountability, authorities and responsibilities of management and non-management personnel that perform functions relevant to the safety and/or security of ground handling operations. The organisational structure shall also specify:

(a) The levels of management with the authority to make decisions regarding risk tolerability with respect to the safety and/or security of ground handling operations;

(b) Responsibilities for ensuring ground handling operations are conducted in accordance with applicable regulations and standards of the Operator;

(c) Lines of accountability throughout ground handling operations, including direct accountability for safety and/or security on the part of ground handling operations senior management.

14.2 The line of responsibilities should be clearly defined for ground handling operations functions associated with, but not limited to, the following:

(a) Ramp Operations;

(b) Passenger Handling;

(c) Baggage Handling;

(d) Cabin services;

(e) Weight and balance control;

(f) Ground support equipment;

(g) Fuel services;

(h) Dangerous Goods.

(i) Opening and securing of aircraft hold doors: securing and locking when loading is complete;

(j) Draining of water from aircraft fuel tanks; and

(k) Maintaining communication between flight deck, cabin crew and ground personnel.

14.3 The Operator shall have a process or procedure for the delegation of duties within the management system for ground handling operations that ensures managerial continuity is maintained when operational managers including, if applicable, post holders are unable to carry out work duties.

14.4 The Operator should have a communication system that enables an effective exchange of information relevant to the conduct of ground handling operations throughout the management system for ground handling operations and in areas where ground handling operations are conducted.

14.5 The Operator shall ensure operational positions within the scope of ground handling operations are filled by personnel on the basis of knowledge, skills, training and experience appropriate for the position.

14.6 Ground handling operation instructions. As applicable to the operation:

14.6.1 Aircraft, passengers and cargo handling procedures related to safety.

A description of the handling procedures to be used when allocating seats, embarking and disembarking passengers and when loading and unloading the aircraft. Further procedures, aimed at achieving safety whilst the aircraft is on the ramp, should also be given. Handling procedures should include:

(a) Ramp Operations

(i) Operation of aircraft doors;

(ii) Loading and securing of items in the aircraft;

(iii) Documents and forms for aircraft handling;

(iv) Special loads and classification of load compartments;

(v) Safety on the aerodrome/operating site, including fire prevention and safety in blast and suction areas;

(vi) Start-up, ramp departure and arrival procedures, including, for aircraft, push-back and towing operations; and

(vii) Security on ramp.

(b) Passenger Handling

(i) Special categories of passengers, including children/infants, persons with reduced mobility, inadmissible passengers, deportees and persons in custody.

(c) Baggage Handling

(i) Permissible size and weight of hand baggage; and

(ii) Baggage transferring to/from aircraft and sorting areas.

(d) Cabin services

(e) Weight and balance controls

(i) Weight and balance controls are detailed in Chapter 3, Aircraft Loading

(f) Ground support equipment

(i) Positioning of ground equipment; and

(ii) Servicing of aircraft.

(g) Fuel services, Fuelling procedures. A description of fuelling procedures, including:

(i) Safety precautions during refuelling and defueling including when an auxiliary power unit is in operation or when rotors are running or when an engine is or engines are running and the prop-brakes are on;

(ii) Refuelling and defueling when passengers are embarking, on board or disembarking; and

(iii) Precautions to be taken to avoid mixing fuels.

(h) Dangerous Goods

(i) Acceptance;

(ii) Dangerous goods transport document;

(iii) Provision of information;

(iv) Loading and Stowage;

(v) Inspection for damage and leakage;

(vi) Securing of dangerous goods cargo loads;

(vii) Removal of contamination; and

(viii) Reporting of dangerous goods accident, incident and occurrences.

14.6.2 Procedures for the refusal of embarkation. Procedures to ensure that persons who appear to be intoxicated, or who demonstrate by manner or physical indications that they are under the influence of drugs, are refused embarkation. This does not apply to medical patients under proper care.

14.6.3 De-icing and anti-icing on the ground

A description of the de-icing and anti-icing policy and procedures for aircraft on the ground should include descriptions of the types and effects of icing and other contaminants on aircraft whilst stationary, during ground movements and during take-off.

In the compliance monitoring program, the operator should establish procedures to ensure that his de-icing/ anti-icing facilities, if applicable, are available to support his operations and such procedures may include:

(a) the checking of the de-icing equipment immediately before the commencement of winter operations and at intervals throughout the winter season to verify that the equipment is fully serviceable at each location where aircraft are likely to require de-icing;

(b) the checking of items such as mixer nozzles for correct calibration and proper installation;

(c) testing of mixtures of de-icing fluids together with suitable conditions for the storage and identification of de-icing fluid; and

(d) where facilities for common use are provided at airports or this task is contracted out to a specialist organisation, such audit checks that must be carried out by the operator to ensure that de-icing/ anti-icing of his type of aircraft are carried out effectively and, in a manner, to ensure safe operation.

14.6.4 Ground Handling Operations with Passengers on board in the absence of flight crew members, whenever passengers are embarking, on board or disembarking in the absence of flight crew members, the operator should:

(a) Establish procedures to alert the aerodrome services in the event of ground emergency or urgent need; and

(b) Ensure that at least one person on board the aircraft is qualified to apply these procedures and ensure proper coordination between the aircraft and the aerodrome services.

14.7 Operational Manuals for Ground Handling Operations

14.7.1 The operator shall describe in its Operations Manual, which may be issued in separate parts, the operational policies, processes, procedures and other information necessary for ground handling personnel to perform their duties and be in compliance with applicable regulations, laws, rules and standards of the operator.

14.7.2 The operator shall ensure the current edition of the Operations Manual is available in a usable format at each location where ground handling operations are conducted.

14.8 Quality Control of Contracted Organisations

14.8.1 The operator shall maintain permanently its ground handling operations responsibility when all or part of the functions and tasks related to ground handling operations services have been contracted to a service provider.

14.8.2 The operator may enter into Ground Handling Agreements with other organisations for the provision of services associated with aircraft arrival, turnaround and dispatch.

In these cases, a written agreement should detail the tasks to be performed on behalf of the operator.

14.8.3 The contracted safety-related activities relevant to the agreement should be included in the operator's safety management and compliance monitoring programs.

14.8.4 The ultimate responsibility for the product or service provided by contracted organisations shall always remain with the operator.

14.9 Training and Qualification

14.9.1 The operator shall establish aircraft ground handling training requirements, handling processes, procedures and practices for all ground handling operations.

14.9.2 The Operator shall have a process to ensure personnel that perform operational duties in functions within the scope of ground handling operations for the Operator, to include personnel of external service providers.

14.9.3 The Operator shall have a process to ensure completion of required training by personnel that perform operational duties in functions within the scope of ground handling operations for the Operator is recorded and such records are retained.

15 OPERATIONAL CONTROL

15.1 The operators shall establish the operational control system in accordance with the Appendix O of this document.

16 TRAINING ON HUMAN FACTORS AND CREW RESOURCE MANAGEMENT

16.1 The operator shall establish and implement a human factor and crew resource management training program for all operating staff. These training programs shall be regularly reviewed and updated, as appropriate, to keep abreast of industry standards. Operating staff is defined in the Authority Regulatory Requirements as the employees and agents employed by the operator, whether or not as members of the crew of the aircraft, to ensure that the flights of the aircraft are conducted in a safe manner.

16.2 The training shall include, but should not be limited to, the following topics:

(a) Communications.

(b) Situational awareness.

(c) Problem-solving / decision-making / judgement.

(d) Leadership / following.

(e) Stress management.

(f) Critique.

(g) Interpersonal skills

17 RESCUE AND FIRE FIGHTING SERVICE

17.1 The operator of an aeroplane shall, as part of its safety management system, assess the level of Rescue and Fire Fighting Service (RFFS) protection available at aerodrome(s) specified in the operational flight plan to ensure that an acceptable level of protection is available for the aeroplane intended to be used.

17.2 Information related to the level of RFFS protection that is deemed acceptable by the operator shall be contained in the operations manual.

18 FLIGHT OPERATIONS WITH KNOWN OR FORECASTED VOLCANIC ASH CONTAMINATION

18.1 For operation into airspace or aerodrome that is forecasted or known to be contaminated with volcanic ash, the operator shall have, for the guidance of its flight dispatch and operational control and in-flight management, documented procedures and safety risk assessment processes within its safety management system accepted by the Authority.

Note 1:- *Guidance on the risk management of flight operations in known or forecasted volcanic ash contamination can be found in the Flight Safety and Volcanic Ash (Doc 9974)*

Note2:- *Procedures recommended for use by pilots whose aircraft have inadvertently encountered a volcanic ash cloud and for post-flight reporting can be found in the Volcanic Ash, Radioactive Material and Toxic Chemical Clouds Manual (Doc 9691).*

19 ARRANGEMENTS FOR ENGINEERING AND MAINTENANCE SUPPORT

19.1 Dangerous Goods for Engineering/Store staff

Awareness of requirements by staff responsible for shipping replacements for equipment of the operator and training where applicable

Whether or not operators hold dangerous goods approval shall establish appropriate procedures to ensure that aircraft spares and supplies are transported in accordance with the Technical Instructions, whether by the company's own Engineering Stores, or by other contractors.

Operators shall ensure their Engineering/Stores staff are aware of requirements in respect of replacements or unserviceable items and keep their record as a receiving and shipping platform as follows;

(a) Aircraft spares and consumables that are dangerous goods have been identified as such.

(b) Aircraft spares and consumables that are dangerous goods after being removed from aircraft are identified as such.

Any such dangerous goods articles or substances are only shipped in compliance with the ICAO Technical Instructions.

An operator that ships aircraft spares meet the criteria of dangerous goods must comply with the shipper's responsibilities states in ICAO Technical Instruction (TI).

Maintenance stores/engineering staff of the operator have received dangerous goods training commensurate with their responsibilities.
An operator not holding a permanent approval to non-carry dangerous goods shall not ship or transport their aircraft spare parts containing dangerous goods on board an aircraft.

CHAPTER 6

TRAINING AND TESTING REQUIREMENTS FOR FLIGHT CREW AND CABIN CREW

1 GENERAL REQUIREMENTS

1.1 Statutory Requirements

1.1.1 The Civil Aviation Authority of Thailand (CAAT) requires all air operators to ensure that all flight crew and cabin crew are properly instructed in their duties, responsibilities and the relationship of such duties to the operation as a whole. Air operators, either Scheduled or Non-Scheduled and other operators who carry cabin crew onboard the aircraft, are required to develop a suitable training programme for their crew members. Statutory requirements relating to the training, testing and periodical checking of flight crew and cabin crew are prescribed in this chapter, which its primary purpose is to indicate the arrangements considered necessary to secure an adequate standard of compliance with the statutory provisions.

1.1.2 The cabin crew and the cabin crew safety instructor training and checking programme shall be developed and documented by the operators. The training and checking manual can form part of the operators' operations manual or be a separate document. It shall contain information, procedures and instructions to cabin crew with respect to the safe operation of all aircraft types and classes. The degree and scope of instruction that is outlined in the manual will depend on the number of aircraft, size, complexity and composition of the organisation.

The manual shall also outline procedures and give guidance to all personnel involved in the training and checking responsibilities. It must address the qualifications, training and standardisation requirements of its training and checking personnel. This will include the selection criteria and minimum experience requirements for all positions that form part of the operators training and checking structure. Guidance to the operators on what information must be included in the cabin crew training and checking manual is outlined in AOCR Appendix E: Guidelines for Cabin Crew Training and Checking.

The operators are required to submit the cabin crew training and checking manual to authority for approval. Each AOC operator must ensure current copies of the training and checking manual are available to authority and all operating crew members and ground staff who are involved in training and checking duties.

1.1.3 For the pilot and pilot instructor training and checking programme, refer to announcement regarding Flight Crew Member Training Programme and Flight Crew Instructor.

1.2 Crew Co-ordination and Combined Training

1.2.1 The successful containment of aircraft emergencies depends heavily upon effective co-ordination and two-way communication between flight crew and cabin crew member.

1.2.2 Operators are expected to make every effort to provide combined training for flight crew and cabin crew. Much of the training that both must receive prior to operating public transport aircraft covers paragraph 3 (Initial Training), paragraph 5 (Aircraft Type Specific Training / Operator Conversion Training), paragraph 7 (Recurrent Training), and paragraph 9 (Differences Training) of this Chapter.

1.2.3 Additional training that cabin crew must receive is listed in paragraphs 4, 6, 8, and 10 of this chapter. Flight crew should be made aware of such additional training provided to cabin crew in compliance with this requirement.

1.2.4 Particular emphasis should be placed on the provision of joint practice in aircraft evacuations so that all who are involved learn of the duties other crew members must perform before, during and after the evacuation. The importance of effective co-ordination and two- way communication between flight crew and cabin crew in various abnormal and emergency situations should also be stressed. Emphasis should also be placed on co-ordination and communication within the crew in normal operational situations including the use of correct terminology, common language and effective use of communications equipment.

1.2.5 Cabin crew shall also be trained to identify unusual situations that might occur inside the passenger compartment, as well as any activity outside the aircraft that could affect the safety of aircraft and/or passengers. The cabin crew shall be able to effectively report to the pilot-in-command:

(a) Any fault, failure, malfunction or defect, which he/she believes may affect the airworthiness or safe operation of the aircraft, including emergency systems; and

(b) Any incident that was endangering, or could endanger, the safety of the operation.

1.2.6 When combined training cannot be arranged, an operator’ s instructors should adopt the role of flight crew or cabin crew, as appropriate.

1.2.7 To facilitate training and to promote consistency of drills and procedures, it is essential that there is effective liaison between flight crew and cabin crew training departments.

1.3 Training Syllabus

1.3.1 A detailed emergency and survival training and checking syllabus is to be specified in the training manual. The syllabus should differentiate between initial training, aircraft type specific training/operator conversion training, recurrent training, differences training, the annual emergency survival test and periodic practice.

1.4 Safety Training Manager, Instructor and Evaluator

1.4.1 A suitably qualified person shall be appointed to manage cabin safety training and checking as a cabin crew safety training manager. The person should demonstrate a thorough understanding and knowledge of the administrative and practical responsibilities and procedures associated with the position and;

(a) Shall have held senior cabin crew or safety training instructor position for minimum 5 years;

(b) Shall have had experience in management;

(c) Shall have had experience in instructional and training skills;

(d) Shall be knowledgeable about applicable regulations and operator's standard operating procedures; and

(e) The appointment shall be subject to acceptance by the authority.

1.4.2 The cabin crew safety training instructors/evaluators shall be responsible to impart effective and efficient training to crew members and conduct examination/ assessment/ in-flight proficiency checks for cabin crew as required in this chapter or in the approved training manual of the operators.

1.4.3 For appointment as a training instructor/evaluator for:

(a) Safety and Emergency Procedures;

(b) Dangerous Goods;

(c) Crew Resources Management; and

(d) First Aid

The operators shall ensure that all applicants have minimum qualifications as follows:

(a) Five years experience as a crew member or previous experience as a safety training instructor. The experience should be acquired within the last 5 years from the date of application;

(b) Have a thorough knowledge and pass theoretical and/or practical assessment of competence in the appropriate aircraft category to demonstrate the ability to instruct and train to the level required by the operators for the issuance of relevant certificate or internal record of approval;

(c) Have ability to fulfill the operators' cabin crew training policy and standards;

(d) Have completely received training in accordance with the applicable requirements of this chapter to efficiently cover the duties and responsibilities to be performed. The minimum total hours of cabin crew instructor training shall be 24 hours which shall include but not limited to:

(i) The fundamental principles of the teaching and learning process;

(ii) Elements of effective teaching;

(iii) Teaching methods and procedures;

(iv) Student evaluation and testing procedures;

(v) Course development;

(vi) Lesson planning;

(vii) Facilitation skills;

(viii) Classroom training techniques; and

(ix) The applicable CAAT Regulations and the AOC holder's policies and procedures

(e) have observed one classroom to the training subject related to their application and have conducted one classroom under supervision of the operator's qualified and suitable personnel to assess their ability to conduct the class effectively.

Note 1: *Regulatory requirements on an appointment of a cabin crew training instructor/evaluator for Aviation Security training, refer to Chapter 4, paragraph 17 of this document, and the National Civil Aviation Security Training Programme for the Kingdom of Thailand.*

Note 2: *Additional requirements on an appointment of a cabin crew CRM instructor, refer to Appendix G of this document.*

1.4.4 Detailed content, testing method and duration of such training mentioned in 1.4.3 of this chapter must be contained in the Operator's Training Manual (Part D) or a separate document which shall be approved by authority. Base on satisfactory performance, the appointment of these training personnel shall be subjected to the approval of the operators. The approval shall be valid as long as the instructor/evaluator remains in the employment of the operator/organisation.

1.4.5 An applicant without the experience requirement in as stipulated in 1.4.1 and 1.4.3 but with other relevant aviation experience or appropriate qualifications may still be considered for appointment subject to the operator's consideration, assessment and approval. Such appointment shall be reported to authority for acknowledgement either by a separate document or a part of the operator's training manual.

1.4.6 Once appointed as an instructor, to continue exercising the functions, an instructor shall have conducted at least one training session of his/her approved authorisation in the previous 6 months. If this requirement is not met, then the instructor shall conduct one training session under the supervision of a qualified instructor prior to resuming any training.

1.4.7 An operator is required to maintain the following records of their instructors and evaluators:

(a) Qualifications and training records;

(b) Training classes observed and conducted;

(c) Examinations received and conducted;

(d) Checks as carried out by the authorised personnel;

(e) Records of performance review; and

(f) Licenses and certificates in accordance with regulatory requirements.

1.5 Supervision of Instructors and Evaluators

1.5.1 The conduct of crew training and of tests carried out by the operator's instructors/evaluators may be observed by authority qualified inspectors. Authority shall monitor the standards of all instructors/ evaluators by:

(a) Monitoring each instructor/evaluator while he/she conducts a skill test or check;

(b) Reviewing the operators' utilisation of instructors/ evaluators on a regular basis; and

(c) Monitoring during standardisation and random checks

1.5.2 All instructors and evaluators shall receive a recurrent training and testing annually to ensure their competency with respect to delegated tasks by using assessment process acceptable to the authority, implemented by the operator or training organization, or at intervals in accordance with the CAAT announcement regarding Flight Crew Member Training Programme and Flight Crew Instructor.

1.5.3 The operators shall ensure that their appointed crew training instructors/evaluators maintain their thorough knowledge, skills and ability to provide effective training and checking to a satisfactory standard. Failure to comply with the operators' approved/accepted manuals or the Authority regulatory requirements may result a revocation of the instructor/evaluator certificate/approval and a cancellation of previous training conducted.

1.6 Records of Crew Training and Tests

1.6.1 Records shall be maintained to show trainees' attendance at each type of training and include information about the results of tests. Records should incorporate certificates indicating the competence of trainees to perform the duties on which they have been tested. The records retention period shall be minimum 3 years.

1.6.2 Operators must keep records for all crew members to show when the next practices and tests are due for renewal. There should also be an effective system to guard against crews being rostered for duty when practices and tests are overdue. The annual emergency and survival test is valid for twelve months and could be completed 2 months preceding the expiry. In that case, the validity of the new test should count from the original expiry.

1.6.3 Records of all initial training, aircraft type specific training/operator conversion training, recurrent training, differences training, aircraft familiarisation visits, familiarisation flights, periodic practice and checking of all crew must be made fully available when requested by the authority.

1.6.4 To facilitate inspection by the Authorised Officers, all crews must carry their certificate of proficiency issued by the operator whenever they are operating a flight.

1.7 Use of Mock Ups, Aircraft Emergency Training Apparatus and Training Organisation for Cabin Crew

Before using of mock ups, aircraft emergency training apparatus, or training organisation for certain periodical training and tests of cabin crew, operators shall verify and satisfy themselves that:

(a) The training devices to be used realistically represent the passenger compartment environment of the aircraft type(s) and the technical characteristics of the equipment to be operated by the cabin crew;

(b) The conduct, the syllabus and associated programmes of the training courses provided by the training organisation comply with the relevant requirements;

(c) The trainers and instructors conducting training sessions are suitably experienced and qualified in the training subject covered, which the Authorised Officers may be assigned to observe; and

(d) The training personnel and organisations used are specified in the company training manual.

(e) Good condition of representative training equipment.

(f) If training devices owned by another operator, training shall be complied with OM part D and procedures of the operator whose crew are being trained.

Subject to the provision in paragraph 1.7(a), the devices should accurately represent the aircraft in the following particulars:

(a) Layout of the cabin in relation to doors/exits, galley areas and safety and emergency equipment stowage. Dimensions should be an accurate representation typical of aircraft in the fleet;

(b) Both cabin crew and passenger seat type and positioning – with particular accuracy where these are immediately adjacent to exits;

(c) Seat dimensions and seat pitch;

(d) Operation of doors/exits in all modes of operation particularly in relation to its method of operation, weight and balance and operating forces, including failure of power-assist systems where fitted;

(e) Extent of movement and associated force of all controls for all equipment and services;

(f) Provision of emergency equipment of the type provided in the aircraft;

(g) All cabin markings;

(h) All cabin lightings;

(i) Cabin crew communications equipment and associated control panels;

(j) Evacuation slides, including normal and standby methods of operation; and

(k) Height and angle of inflated evacuation slides.

Operators shall conduct their oversight periodically to ensure that the use of such training devices and organisation are in compliance with the Authority's requirements and regulations.

1.8 Lease of Thai Registered Aircraft Operated by Foreign Cabin Crew

1.8.1 Subject to the Authority' s approval, consideration may be given to foreign cabin crew to undergo a special training programme in lieu of the requirements as spelt out in paragraphs 3, 4, 5, 6, 7, 8, 9 and 10 of this chapter. All necessary training records and information pertaining to the foreign operator's cabin crew shall be provided to the Authority at least 15 days in advance for assessment.

1.8.2 Any special training programme approved by the Authority shall include all testing requirement as spelt out in this chapter in order to enable the foreign cabin crew to operate charter flights for a short period under a Thai Air Operator Certificate.

1.8.3 Authorised Officers will conduct an inspection of such special training programme including the first flight being carried out by the operator using the foreign cabin crew. The operator shall bear all expenses incurred in carrying out such inspections.

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2 PURPOSE AND PROVISION OF TRAINING

2.1 Applicability

2.1.1 The requirements of this Chapter are applicable to all operating flight crew and cabin crew carried on board an aircraft.

2.2 Purpose

2.2.1 The purpose of emergency and survival training, practice and checking is to provide crew with the knowledge, skills and confidence needed to ensure that they deal efficiently with different types of emergency and survival situations.

2.3 Arrangements

2.3.1 Operators are to ensure that organised courses of instruction are given by qualified instructors on the use of all emergency and survival equipment, and on all emergency procedure and drills, including aircraft familiarisation and emergency evacuation.

2.4 Training Methods and Equipment

2.4.1 Suitable training methods shall be provided to enhance the presentations in both classroom and practical instruction sessions. A reasonable balance between the different training methods should be ensured so that the trainees achieve the level of proficiency necessary for safe performance of all related duties and responsibilities.

2.4.2 Suitable training equipment shall be provided to enhance the trainee's knowledge and experience on its operations. Such training equipment must be representative of that installed on the aircraft. For oxygen and protective breathing equipment, units charged with or without oxygen may be used.

2.5 Number of Trainees per Class / Trainee to Instructor Ratio

2.5.1 In order to provide for sufficient supervision and control during classroom-based training, the maximum number of trainees per class shall not exceed 30. The operator shall ensure that suitable classroom and training facilities are provided. An evaluation should be conducted and consideration should be given to subject matter, type of training (such as initial/recurrent), instructor's workload management, feedback/evaluations and size of facilities, which may prompt an adjustment of the proposed trainee to instructor ratio for classroom-based training.

2.5.2 In order to assess and evaluate a trainee's competency during each practical training such as hands-on exercise and drills, and for a better supervision during aircraft familiarisation visits, the trainee to instructor ratio shall be more restricted. The maximum number of trainees per instructor in such training shall not exceed 10, and the maximum number of trainees per class shall not exceed 30. However, consideration should be given to the type

of practical training or exercise being performed. For example, individual hands-on exercises on safety and emergency equipment versus group simulated exercises may prompt an adjustment of the proposed trainee to instructor ratio.

2.5.3 When conducting a familiarisation flight, the operator shall establish limits on the ratio of trainees to the person who conducts the familiarisation flight.

2.6 Before Flying on Aircraft

2.6.1 Before flying training is commenced on actual aircraft, all crew are to have successfully completed all necessary training, practice and tests as described in this Chapter.

2.7 Introduction of New Safety and Emergency Equipment

2.7.1 The operator is to ensure that the appropriate crew are trained on the use of new equipment that is introduced and receive practical training as appropriate.

3 INITIAL TRAINING - ALL CREW

3.1 Introduction

3.1.1 Crew are to be trained in the following subjects which are of a general nature and not necessarily related to a specific aircraft type.

3.2 Crew Co-ordination

3.2.1 Emphasis is to be placed on the importance of effective co-ordination and two-way communication between flight crew and cabin crew in various emergency situations. Cabin crew should be trained to be alert, and to identify unusual situations that might occur inside the passenger compartments, as well as any activity outside the aircraft that could affect the safety of the aircraft or its occupants. The need for effective communications or accurate information between flight crew and cabin crew must be stressed.

3.3 Aeromedical and First Aid Topics

3.3.1 Instruction should be given on aeromedical topics such as:

(a) First aid subjects appropriate to the aircraft type, i.e. Its size and the number of flight crew carried;

(b) Guidance on the avoidance of food poisoning, with emphasis on the choice of a pre-flight meal and the importance of the Pilot-in-Command and Co-Pilot eating different food at different times during the flight, especially on long sectors;

(c) The possible dangers associated with the contamination of the skin or eyes by aviation fuel and other fluids and their immediate treatment;

(d) The recognition and treatment of hypoxia and hyperventilation; and

(e) First aid associated with survival training appropriate to the route operated (e.g. polar, desert and jungle).

3.3.2 Flight crew who operate on aircraft where cabin crew are not carried should undertake training in basic first aid that is to include the use and contents of first aid kits and in Cardio Pulmonary Resuscitation.

3.4 Fire and Smoke Training

3.4.1 Practical fire and smoke training must be conducted under the supervision of an instructor who has the knowledge, ability and experience to conduct such training.

3.4.2 Both theoretical and practical training shall be given. Emphasis shall be placed on:

(a) An appreciation of the chemistry of fire as a preliminary to consideration of the choice of extinguishing agents for particular fire situations, the techniques of applying extinguishing agents, and if practical, the consequences of misapplication and their use in a confined space; and

(b) A demonstration or film on fire extinguishers being used on various types of fires. Fires should be related to typical aircraft interior equipment and include galley fires, fires in toilets, upholstery, passenger service units and electrical installations.

3.5 Water Survival Training

3.5.1 Aircraft water survival training

Where flotation equipment is carried, a comprehensive wet drill to cover all ditching procedures must be practiced by all crews. This wet drill is to include, as appropriate, practice of the actual donning and inflation of a life-jacket, together with a demonstration or film of the inflation of life- rafts and/ or slide- rafts. All crews must board a life raft or a similar flotation equipment from the water whilst wearing their uniform or similar attire with a life-jacket identical to that being carried on the aircraft. Training must include the use of all survival equipment carried on board the life raft or flotation equipment and any additional survival equipment carried separately on board the aircraft.

3.5.2 Helicopter water survival training

Where life-raft are fitted for helicopter extended overwater operations (such as sea pilot transfer, offshore operations, regular, or scheduled, coast-to coast overwater operations), a comprehensive wet drill to cover all ditching procedures should be practiced by aircraft crew. This wet drill should include, as appropriate, practice of the actual donning and inflation of a life-jacket, together with a demonstration or audio-visual presentation of the inflation of life-rafts. Crews should board the same (or similar) life-rafts from the water whilst wearing a life-jacket. Training should include the use of all survival

equipment carried on board life-rafts and any additional survival equipment carried separately on board the aircraft.

(a) Consideration should be given to the provision of further specialist training such as underwater escape training. Where operations are predominately conducted offshore, operator should conduct 3-yearly helicopter underwater escape training at an appropriate facility;

(b) Wet practice drill should always be given in initial training unless the crew member concerned has received similar training provided by another operator;

3.5.3 In the case where no cabin crew is required, consideration shall be given to aircraft crew first aid training, appropriate to the aircraft type, the kind of operation and crew complement.

3.6 Survival Training

3.6.1 Operators are to provide survival training, including the use of any survival equipment carried, appropriate to their areas of operation, e.g. polar, desert, jungle or sea.

3.7 Human Factors and Crew Resource Management

3.7.1 Training shall address the fundamental human factor concept, crew resource management, physiological effects on the human body of flying, the problems associated with pressure change and hypoxia and the need for restrictions on underwater diving. Training shall include information on flight time limitations, the effects of operating for extended periods of time and the effects of time zone changes. Operational limitations shall include illness, use of alcohol and drugs, blood donations etc. Advice shall be given on general health care, especially whilst operating overseas, and the need for preventive medicine such as immunisation, when operating to potentially infected areas.

Note: Human Factor may be included in Crew Resource Management Training.

3.8 Aerodrome Emergency Services

3.8.1 The operational procedures of ground-based emergency services at aerodromes should be discussed.

3.9 Aviation Security

3.9.1 The guidance for Aviation Security training programme for all crew can be found in the National Civil Aviation Security Training Programme for Kingdom of Thailand (NCASTP).

3.10 Dangerous Goods Training

3.10.1 An operator shall establish and maintain staff training programmes, as required by the ICAO Technical Instructions. These training programmes shall be approved by the Authority. For the dangerous goods training requirements can be found in the Chapter 4, paragraph 16 of this document.

3.10.2 An operator shall ensure that all their crew members have passed a test on Dangerous Goods prior to operating as a crew member.

3.11 Safety Management System

3.11.1 An operator shall provide the Safety Management System training for all crew and course elements shall be referred to the company Safety Management System training programme.

3.12 Cabin Crew Service Duties

3.12.1 Cabin crew should also receive training in their normal flying duties including the location and use of all cabin and galley equipment and to take the necessary safety precautions to prevent injuries when using such equipment.

4 INITIAL TRAINING - ADDITIONAL ITEMS FOR CABIN CREW

4.1 General

4.1.1 Cabin crew are to be trained in the following additional subjects which are of a general nature and not necessarily related to a specific aircraft type.

4.2 Duties and Responsibilities

4.2.1 Operators must ensure that cabin crew receive training on general responsibilities, pre-flight, in-flight, and post-flight duties. Emphasis should be placed on:

(a) The importance of performing their duties in accordance with the operations manual;

(b) Continuing competence and fitness to operate as a cabin crew member with special regard to flight and duty time limitations, fatigue and rest requirements;

(c) An awareness of the aviation regulations relating to cabin crew and the role of the authority;

(d) General knowledge of relevant aviation terminology, phases of flight and parts of the aircraft;

(e) Pre-flight briefing of cabin crew and the provision of necessary safety information with regard to their specific duties;

(f) The importance of ensuring that relevant documents and manuals are kept up to date with amendments provided by the operator;

(g) The importance of identifying when cabin crew members have the authority and responsibility to initiate an evacuation and other emergency procedures; and

(h) The importance of safety duties and responsibilities, and the need to respond promptly and effectively to emergency situations.

4.3 First Aid

4.3.1 Instruction shall be given on first aid medical supplies (e.g. contents and use of appropriate equipment including first aid oxygen, first aid kits and emergency medical kits), together with the application of any drugs. The following subjects shall also be covered:

(a) Haemorrhage;

(b) Wounds and bleeding;

(c) Fractures, dislocation and sprains including head/spinal injuries;

(d) Burns;

(e) Care of the unconscious;

(f) Shock;

(g) Heart attacks;

(h) Stroke, epilepsy, diabetes;

(i) Rescue breathing and cardiopulmonary resuscitation for infants and adults;

(j) Use of therapeutic oxygen and oxygen sets;

(k) Poisoning, effect of drugs and intoxications;

(l) Emergency childbirth;

(m) Choking – adult child and infant;

(n) Stress reactions and allergic reactions;

(o) Air sickness;

(p) Asthma;

(q) Transmissible, quarantinable, and endemic diseases;

(r) Personal hygiene on board;

(s) In-flight medical emergencies and incidents including death on board handling; and

(t) Alertness management, physiological effects of fatigue, sleep physiology, circadian rhythm and time zone changes.

Note: *Cabin crew must demonstrate their proficiency in rescue breathing and practical Cardio Pulmonary Resuscitation using a specifically designed dummy and taking account of the characteristics of an aircraft environment.*

4.4 Fire and Smoke Training

4.4.1 It is particularly important that each cabin crew shall be given theoretical and practical training in dealing with emergency situations involving fire and smoke in the cabin. The training is to be realistic and practical in the use of all fire-fighting equipment, including Protective Breathing Equipment (PBE) representative of that carried in the aircraft. Each cabin crew shall extinguish an actual fire characteristic of an aircraft interior fire and exercise the donning and use of PBE in an enclosed simulated smoke-filled environment with particular emphasis on the importance of identifying the actual source of fire and smoke. Such training shall also include:

(a) The responsibility of cabin crew to deal promptly with emergencies involving fire and smoke;

(b) The importance of informing the flight crew immediately that fire or smoke is discovered and of keeping them informed as the situation develops. The importance of crew co-ordination and communication is to be emphasized, together with an established procedure for communication with the flight deck;

(c) The importance of ensuring that passengers are aware of no smoking areas and obey no smoking signs. Emphasis is to be placed on the frequent and systematic checking of toilets (including smoke detectors, if applicable) and other areas which are not part of the seating accommodation;

(d) The classification of fires and the appropriate type of extinguishing agents and procedures for particular fire situations; and

(e) The techniques of application of extinguishing agents, the consequences of misapplication, and of use in a confined area.

4.5 Abusive Passengers

4.5.1 Operators are to give advice to cabin crew on the recognition and management of passengers who are, or become, aggressive, abusive or under the influence of drugs or excessive consumption of alcohol, or a combination of both.

4.6 Seat Allocation

4.6.1 Cabin crew are to be given training on the importance of correct seat allocation with reference to aeroplane mass and balance, special categories of passengers and the necessity of seating able-bodied passengers adjacent to unsupervised exits.

4.7 Prohibited and Dangerous Items

4.7.1 Cabin crew shall be given training in aspects of the carriage of prohibited and dangerous goods and the handling of in-flight dangerous goods incident.

4.8 Flight Time Limitations

4.8.1 Cabin crew must be made familiar with the company flight time limitations scheme and the statutory requirements regarding crew fatigue.

4.9 Crew Resource Management (CRM) Training

4.9.1 Operators must provide CRM training for all cabin crew. This course shall be conducted by at least one pilot/cabin crew CRM instructor. The training elements shall be covered in depth and shall focus on the functioning of crew members as a team and not simply as a collection of competent individuals. The cabin crew should be shown the importance of effective teamwork and communication, the barriers involved and how to overcome them. Emphasis should be given on their role as safety practitioners and the need to maintain a high level of awareness in the environment they operate in. Details on CRM training contents and requirements shall be referred in Appendix G of this document.

4.10 Aircraft Safety on the Ramp

4.10.1 Training should be given in the following areas:

(a) Selection and implementation of appropriate rapid disembarkation or evacuation measures.

(b) The need for an external means of disembarkation to be available from the time an aircraft comes on a stand until it departs, excluding periods when there are no persons on board.

(c) The need to ascertain the availability of an aerobridge or steps before deciding what would be the best method to use.

(d) Specific procedures for alerting of emergency services when an incident occurs during routine embarkation/disembarkation of passengers and when passengers are on board and the aircraft is parked.

4.11 Passenger Briefings

4.11.1 Training and practice is to be given in the pre-flight briefing of passengers in normal and emergency situations, including landings, ditching, demonstrating the brace position and the briefing of able-bodied passengers on how to operate the emergency exits.

4.11.2 Briefings are to be given in English or Thai, and in any other language where passenger demography so require.

4.11.3 Training shall also be given for the conduct of pre-flight safety briefings to passengers requiring special assistance.

4.12 Cabin Baggage and Cabin Clutter

4.12.1 Cabin crew are to be instructed on rules covering the safe stowage of cabin baggage and cabin service items and the risk of it becoming a hazard to occupants of the passenger compartment or otherwise obstruction or damaging emergency equipment or exits. It shall include the areas where it would be unsafe to do so.

4.13 Brace Positions

4.13.1 Training and practice is to be given in the correct brace positions for both crew and passengers. Such training must take into account different seating configurations and orientation.

4.14 Evacuation Procedures and Emergency Situations

4.14.1 Emergency evacuation is to include the recognition of particular types of emergency situations. Cabin crew will also need to recognize when exits are unusable or when evacuation equipment is unserviceable and to act accordingly to overcome these problems. Circumstances might arise, such as the incapacitation of the flight crew, where these drills need to be initiated by cabin crew.

4.14.2 Cabin crew are also to be trained at least the following topics in the evacuation procedures and emergency situations training:

(a) General emergency procedures and basic principles;

(b) Emergency equipment;

(c) Emergency lighting system;

(d) An unpremeditated emergency on take-off or landing and ditching;

(e) Evacuation procedures;

(f) An in-flight fire, with particular emphasis on establishing the fire source, firefighting procedures, and smoke removal procedures (if applicable);

(g) Decompression, including the donning of portable oxygen equipment; and

(h) Severe turbulence.

4.15 Crowd Control

4.15.1 Operators are to provide comprehensive training in the practical application of all aspects of crowd control technique in various emergency evacuation situations. Training is also to emphasize the need for cabin crew to be assertive and, at times, aggressive during an

emergency evacuation. Scenarios must be as realistic as possible and should include, as a minimum:

(a) Communications between flight crew and cabin crew and use of all communications equipment, including the difficulties of co-ordination in a smoke-filled environment;

(b) Verbal commands;

(c) The physical contact that may be needed to direct passengers out of an exit and on to a slide;

(d) The re-direction of passengers away from unusable exits;

(e) The marshalling of passengers away from the aircraft;

(f) The evacuation of disabled passengers; and

(g) Authority and leadership.

4.15.2 The executive order to initiate an emergency evacuation is to be given by the Pilot-in-Command in English (e.g. “Evacuate, Evacuate”). Cabin crew of a particular nationality if carried on board where passenger demography so requires should be able to repeat the evacuation order and commands in their native language if the need arises.

4.16 Pilot Incapacitation

4.16.1 Where the flight crew consists of only 2 pilots, cabin crew are to be given training in recognizing the signs of subtle incapacitation and practice the ways in which they can be of help in the event of pilot incapacitation. The cabin crew shall also be taught on the principle of pilot incapacitation drills which will include the following:

(a) The need to use the pilot’s oxygen equipment;

(b) Fastening and unfastening pilot’s seat harness and, in the case of inertia and harness, locking and unlocking the inertia device; and

(c) Using pilot’ s sliding seat mechanism; and “locking” the pilot in his seat rather than on removing him from the seat, which may not in the event be possible.

4.17 Aviation Indoctrination

4.17.1 The cabin crew shall be taught on the contents of aviation indoctrination which will include the following:

(a) Regulatory aspects - company specific, national and international regulations;

(b) Aviation terminology and terms of reference;

(c) Theory of flight and aircraft operation, including major aircraft components, critical surfaces, pressurization system, weight and balance, meteorology and turbulence, communication equipment, and air traffic control; and

(d) Physiology of flight – oxygen system and use, effects of altitude, and cabin poisoning.

4.18 Handling Unaccompanied Minors

4.18.1 Operators shall not permit unaccompanied minors under the age of five (5) to travel without an accompanying person.

4.18.2 Operators shall establish a programme for the handling of unaccompanied minors travelling under their supervision. Training programmes should take into account the need for both ground staff and cabin crew to be fully conversant with these procedures.

4.19 Trafficking in Persons

4.19.1 Cabin crew should be given training in awareness on identification and appropriate response to trafficking in persons on board aircraft. Appropriate training methods (e.g. classroom, computer-based training, simulated exercises, videos, role play, a discussion group or online forum) should be selected to the subject matter. Emphasis should include, as a minimum:

(a) Overview of trafficking in persons:

(i) Elements of trafficking (including legislation or national regulations related to trafficking in persons, which impact cabin crew members duties and responsibilities);

(ii) Why trafficking happens, including a description of victims and traffickers;

(iii) Difference between trafficking and smuggling; and

(iv) Types of trafficking;

(b) Indicators:

(i) General indicators; and

(ii) In-flight specific indicators;

(c) Operator policy; and

(d) Procedures related to recognizing and responding to trafficking in persons;

(i) Cabin management (e.g. Responding to other passengers' concerns);

(ii) The concept of "do no harm",

(iii) Communication and coordination between cabin crew and flight crew; and

(iv) Reporting (including the notion that it is better to report suspicions than remain silent).

4.19.2 Trafficking in persons should be delivered to each cabin crew in recurrent training. This topic should include, as appropriate:

(a) Any changes to legislation or national regulations related to trafficking in persons, which impact cabin crew members' duties and responsibilities;

(b) Any changes to the operator's policy and procedures related to trafficking in persons;

(c) Case studies (e.g. Occurrences of trafficking in persons which may have occurred with the operator or other operators); and

(d) References to agencies dealing with trafficking in persons and useful information, such as websites or publications which cabin crew members may which to consult.

4.19.3 It is recommended that the training bring together both cabin crew and flight crew members and be conducted as part of joint crew resource management training.

5 AIRCRAFT TYPE SPECIFIC TRAINING/OPERATOR CONVERSION TRAINING – ALL CREW

5.1 General

5.1.1 Each Cabin crew member shall have successfully completed appropriate aircraft type specific training/operator conversion training for each aircraft type, as well as the associated checks, before being:

(a) First assigned by the operator to operate as cabin crew member; or

(b) Assigned by that operator to operate on another aircraft type.

Operators shall ensure that comprehensive training is given on the operating procedures and the location and use of all emergency and survival equipment to be carried on the aircraft, and that all emergency training is related to the aircraft type, series and configuration to be operated. An aircraft type specific training must be given to all newly employed cabin crew and an operator conversion training must be given to those who are converting to a new aircraft type.

Note 1: *The actual use of safety and emergency equipment and training of operating procedures need not be repeated for crew who are still currently flying with the operator and have covered the same type of safety and emergency equipment and procedures in previous training provided by the operator.*

Note2: *For flight crew, refer to Flight Crew Member Training Programme Announcement B.E 2559.*

5.2 Emergency and Survival Equipment

5.2.1 Training must be given in the location and use of all emergency and survival equipment together with the relevant drills and procedures. The following must be included:

(a) Emergency exits both normal and emergency operation;

(b) Escape slides and, where non-self-supporting slides are carried, the use of any associated ropes;

(c) Life-rafts and slide-rafts, including the equipment attached to and/or carried in the raft;

(d) Adult, child, and infant life-jackets, or other individual flotation device;

(e) Drop-out oxygen and its manual deployment;

(f) Portable oxygen equipment (bottles, passenger mask, full face mask, flight deck oxygen mask);

(g) Protective breathing equipment;

(h) Fire extinguishers;

(i) Crash axes;

(j) Fire protective gloves;

(k) Smoke goggles;

(l) Emergency flashlights, portable lights, and torches;

(m) Emergency lighting systems, including floor proximity lighting systems;

(n) Communications equipment, including megaphones;

(o) Survival kits, including their contents;

(p) Pyrotechnics;

(q) First aid kits and their contents;

(r) Universal precaution kits and their contents;

(s) Toilet compartment smoke detector systems;

(t) Evacuation alarm systems; and

(u) Non-mandatory or special equipment fitted or carried.

Note 1: *For additional safety and emergency equipment for cabin crew training, refer to Appendix E, paragraph 2.24.*

Note 2: *A visit to an actual aircraft to familiarise the crew on the aircraft features and the location and complement of all safety and emergency equipment is mandatory prior to commencement of line flying on each type of aircraft to be operated.*

5.3 Fire Training

5.3.1 Training must be given in extinguishing a fire, representative of an interior aircraft fire using the relevant type of fire extinguisher carried on the aircraft. Emphasis is to be placed on the characteristics of different types of extinguishers, including their effective range and duration and the effectiveness of their use on differing types of fires.

5.4 Protective Breathing Equipment

5.4.1 Crews must be trained in the use of protective breathing equipment. Donning and wearing of such equipment should be practiced in an enclosed, simulated smoke-filled environment.

6 AIRCRAFT TYPE SPECIFIC TRAINING/OPERATOR CONVERSION TRAINING – ADDITIONAL ITEMS FOR CABIN CREW

6.1 Practical Training

6.1.1 The following are the minimum level of training necessary to satisfy the relevant requirements for cabin crew aircraft type specific training / operator conversion training:

(a) During ditching and evacuation drills, each trainee operates and actually opens all normal and emergency exits; attaches escape slide fittings in their proper places; descends an escape slide from a height representative of the aircraft main deck sill height (not required for subsequent type training unless sill height is significantly higher); locates and operates the megaphone; and observes a demonstration on the removal of life-rafts from stowage and positions in the launching area. Additionally, the trainee must demonstrate the ability to locate and remove from stowage the aircraft first aid kits and fire extinguishers;

(b) Each trainee observes a demonstration of an escape rope being used as a means of emergency evacuation; the inflation or release, as applicable, of an escape slide; inflation of a life-raft; the survival equipment contained in the life-raft; the contents of the first aid kits; administering supplemental crew and passenger oxygen by portable equipment;

(c) Each trainee observes a demonstration of the use of each type of fire extinguishers carried on the aircraft on various types of fire including simulated electrical, cabin furnishing and galley fires. The demonstration should also show the effect of misapplication of agents;

(d) Each trainee handles and uses each type of fire extinguisher and protective breathing equipment carried on the aircraft;

(e) Each trainee practices the actual movements and operations using a portable oxygen bottle and the donning of oxygen masks carried in the aircraft;

(f) Each trainee is familiarised with the use of the aircraft public address (PA) and interphone system; and

(g) Each trainee is familiarised with the use of life jackets carried in the aircraft.

6.2 Pilot Incapacitation

6.2.1 When the aircraft type consists of a minimum crew of only 2 pilots, cabin crew must be given training on the following, specific to the aircraft type:

(a) Use of pilot's oxygen equipment;

(b) Fastening and unfastening pilot's seat harness and in the case of inertia reel harness, locking and unlocking the inertia device; and

(c) Using the pilot's sliding seat mechanism. Training is to be given with the seat occupant simulated physically collapsed. Emphasis to be placed on 'locking' the pilot in his seat rather than removing on him from the seat, which may not in the event be possible.

6.3 Passenger Briefing on Self Help Exits

6.3.1 Training and practice are to be given to cabin crew on briefing the passengers on the operations of self-help exits, applicable to the aircraft type.

6.4 Cabin Baggage and Cabin Clutter

6.4.1 Training is to include the areas of the cabin that are approved for the stowage of cabin baggage or other items and the areas where it would be unsafe to do so.

6.5 Brace Positions

6.5.1 Training and practice are to be given in the correct brace positions for both cabin crew and passengers taking into account different seating configurations and orientation applicable to the aircraft type.

6.6 Familiarisation Flights and Aircraft Familiarisation Visits

6.6.1 For commercial air transport operations, familiarisation of cabin crew to a new aircraft type or variant shall be completed in accordance with the following, as relevant:

(a) New entrant cabin crew; and

(b) Cabin crew operating on a subsequent aircraft type.

6.6.2 New entrant cabin crew

Prior to operating as a crew member, each new entrant cabin crew shall be assigned to participate in:

(a) A familiarisation visit to the aircraft to be operated; and

(b) A minimum of four familiarisation sectors which shall be only on successful completion of theoretical and practical emergency and survival training.

6.6.3 Cabin Crew operating on a subsequent aircraft type

A cabin crew member assigned to operate on a subsequent aircraft type with the same operator shall participate either in:

(a) A familiarisation visit to the aircraft to be operated; or

(b) A minimum of two familiarisation sectors which shall be only on successful completion of related theoretical and practical emergency and survival training.

6.6.4 Familiarisation flights

(a) During familiarisation flights, the cabin crew member shall be assigned in addition to the minimum number of cabin crew required in accordance with Chapter 7 of this document. Crew composition of trainees in familiarisation flights shall not exceed the ratio of one trainee to one operating senior cabin crew and shall not exceed 50 per cent of the required minimum cabin crew complement.

(b) Familiarisation flights shall be:

(i) Completed within 30 days of fulfilling the requirements of the ground instruction and practical training specified in the operator's training programme. In case of delay in the completion of 4 familiarisation sectors within 30 days, an additional 2 sectors from minimum requirements shall be carried out for every 30 days or part thereof;

(ii) Conducted on commercial sectors under the supervision of the senior cabin crew member;

(iii) Structured and conducted with the cabin crew member participating in pre-flight, in-flight and post-flight safety duties;

(iv) Operated with the cabin crew member wearing the operator's cabin crew uniform; and

(v) Recorded in the training record of the cabin crew member.

6.6.5 Aircraft familiarisation visits

Aircraft visits should enable the cabin crew member to become familiar with the aircraft environment and its equipment. The visit shall be typically conducted on board a stationary on-type aircraft by appropriately qualified persons e.g. SEP Instructor in accordance with a syllabus described in the operator's training manual. The aircraft visit shall provide an overview of the aircraft's exterior, interior and aircraft systems with emphasis on the following:

(a) Interphone and public-address systems;

(b) Evacuation alarm systems;

(c) Lighting system (interior, exterior and emergency lights);

(d) Electrical system (galley, lavatory, in-flight entertainment, in-seat electrical system);

(e) Oxygen system (cabin and flight deck);

(f) Smoke detection systems;

(g) Safety and emergency equipment, including location and operation;

(h) Flight crew compartment;

(i) Cabin crew stations;

(j) Cabin layout, configuration, control panels and aircraft systems relevant to cabin crew duties;

(k) Lavatories;

(l) Galleys, galley security and water shut-off;

(m) Cargo areas if accessible from the passenger compartment during flight;

(n) Circuit breaker panels located in the passenger compartment (if applicable);

(o) Crew rest areas (if applicable);

(p) Assisting evacuation means (slide, slide raft, life raft, escape rope, etc.); and

(q) Doors/exits type, location, operation and environment.

7 RECURRENT TRAINING - ALL CREW

7.1 Recurrent Training

7.1.1 Operators must ensure that an organised course of recurrent training is provided for all crews to prepare for the emergency survival test. Such training will have the additional advantage of allowing crews to discuss recent incidents, difficulties and emergencies which have been experienced. If none have arisen, operators should discuss possible scenarios with emphasis on what actions should be taken. Time must be allocated for this purpose. This discussion is particularly important when cabin crew are assigned to more than one type of aircraft. First aid and aviation security recurrent training must also be included.

7.1.2 In addition, the recurrent training shall also cover:

(a) Knowledge on human performance as related to cabin safety duties including flight crew-cabin crew coordination; and

(b) Reinforcement of Crew Resource Management.

7.2 The Annual Emergency Survival Test

7.2.1 CAAT Regulatory Requirements require that all crew be tested on aspects of emergency and survival appropriate to the aircraft type to be operated. The maximum period of validity of this test is twelve months. The requirements make a distinction between tests and practice and operators should apply a similar distinction in their crew training records. The annual emergency and survival test could be completed 2 months before the expiry. In that case, the validity of the new test should count from the last test expiry.

7.2.2 All crew must pass a test on their knowledge of the location and use of emergency survival equipment and the appropriate drills and procedures including emergency situations. The test will be related to the aircraft type and cover every series and configuration. Appropriate written tests are required and must include first aid topics.

7.2.3 To demonstrate their proficiency in carrying out emergency duties, crew shall practice the actual movements and operations assigned to them in evacuation and other emergency drills. Such practice shall include the use of emergency and life-saving equipment required to be carried, such as life jackets, life rafts, evacuation slides, emergency exits, portable fire extinguishers, oxygen equipment/ masks, protective breathing equipment, first-aid and universal precaution kits. Touch drills for opening emergency exits on the aircraft(s) to be operated shall be included. For details on cabin crew periodic practice, refer to paragraph 8 of this chapter.

7.3 Periodic Practice

7.3.1 At least once every 12 months or requirements specified, flight crews are to carry out practice in accordance with the CAAT Announcement on Flight Crew Member Training Programme.

7.4 Security Recurrent Training

7.4.1 Security recurrent training shall be conducted for all crew. This is to keep the crew informed on the latest threat and security issues. In addition, the training should also be served as a useful feedback session to review the operator's security procedures. Refer to the National Civil Aviation Security Training Programme for the Kingdom of Thailand for more details.

7.5 Dangerous Goods Recurrent Training

7.5.1 The operators shall provide the recurrent dangerous goods training for all crew. For the dangerous goods training requirements can be found in the Chapter 4, paragraph 16 in this document.

7.5.2 The operators shall ensure to conduct annual training for their cabin crew on the types of dangerous goods which may, or may not, be carried in a passenger cabin.

7.5.3 The operators shall ensure that all their crew members have passed a written test as part of the recurrent training and the test shall be retaken annually.

7.6 Safety Management System Recurrent Training

7.6.1 An operator shall provide recurrent Safety Management System training for all crew and course elements shall be referred to the company Safety Management System training programme.

8 RECURRENT TRAINING - ADDITIONAL ITEMS FOR CABIN CREW

8.1 The Annual Emergency Survival Test

8.1.1 Cabin crew shall show satisfactory knowledge of crowd control techniques, and if applicable, their role in the event of pilot incapacitation. Cabin crew shall also undertake first aid recurrent training and pass an appropriate written test.

8.2 Periodic Practice

8.2.1 Once annually, cabin crew are to demonstrate their competence in carrying out the following practical drills:

(a) Use of an emergency exit in normal and emergency mode;

(b) Use of each type of extinguishers and protective breathing equipment carried on board the aircraft(s) to be operated;

(c) First aid, practical rescue breathing and cardio pulmonary resuscitation using a dummy specifically designed for the purpose; and

(d) Use of first-aid and universal precaution kits carried on board the aircraft(s) to be operated.

8.2.2 Once every 36-months period, cabin crew are to demonstrate their competence in carrying out the following practical drills:

(a) Emergency evacuation slide representative to the highest of the aircraft main deck sill height operated by the cabin crew; and

(b) Boarding a slide raft/life raft with a life jacket representative to the actual equipment on board the aircraft to be operated.

9 DIFFERENCES TRAINING

In addition to the training required in paragraphs 3, 4, 5, 6, 7 and 8 of this chapter, the crew shall complete appropriate training and checking covering any differences before being assigned on:

(a) A variant of an aircraft type currently operated; or

(b) A currently operated aircraft type or variant with different:

(i) Safety and emergency equipment;

(ii) Safety and emergency equipment location; or

(iii) Normal and emergency procedures.

The differences training program shall include the following as a minimum, as applicable to the particular aircraft:

(a) Door/exits (type, number, location and operation);

(b) Assisting evacuation means (slide, slide-raft, life raft, escape rope, etc.);

(c) Safety and emergency equipment, including location and operation;

(d) Aircraft systems relevant to crew duties and responsibilities;

(e) Normal procedures and the related hands-on and/or simulated exercises;

(f) Abnormal and emergency procedures and the related hands-on and/or simulated exercises; and

(g) Design-related elements that may impact on normal and/or emergency procedures (stairs, smoke curtain, social areas, non-forward-facing passenger seats (if applicable), cargo areas if accessible from the passenger compartment during flight (if applicable), etc.

This training and the associated checking shall be accomplished through classroom instruction, CBT (if applicable), as well as hands-on and simulated exercises with a representative training device capable of reproducing the appropriate environment/equipment characteristics, or on an actual aircraft.

Note: *For flight crew differences training, refer to CAAT Flight Crew Member Training Programme Announcement.*

10 IN-CHARGE CABIN CREW TRAINING

10.1 Initial Training

10.1.1 All newly appointed in-charge cabin crew member shall be given training on the following topics as a minimum, but not limited to:

(a) Items to be covered at pre-flight briefing:

(i) Allocation of cabin crew stations and responsibilities;

(ii) Aircraft type and equipment fit;

(iii) Area, route, type of operation, special circumstances of flight; and

(iv) Any special category passengers such as infants, disabled or stretcher cases, etc.

(b) Communication and co-operation with the crew and other personnel:

(i) Discipline, responsibilities and chain of command;

(ii) Importance of co-ordination and communications; and

(iii) Action in the event of pilot incapacitation.

(c) Review of legal and operator's requirements pertaining to cabin safety:

(i) Passenger safety briefing, safety cards;

(ii) Securing of galleys;

(iii) Stowage of cabin baggage;

(iv) Restrictions on use of portable electronic device;

(v) Procedure during turbulence; (see note)

(vi) Procedures when re-fueling with passengers on board; and

(vii) Documentation.

(d) Human Factors and Crew Resource Management;

(e) Accident and incident reporting systems and requirements;

(f) Flight and duty time limitations and rest requirements;

(g) Safety on the ramp;

(h) Aircraft diversion involving emergency first aid cases;

(i) Minimum equipment list;

(j) Aviation security matters;

(k) Use of automated external defibrillators (if carried); and

(l) Leadership skills.

After a completion of In- Charge Cabin Crew Initial Training Course, appropriate testing and in- flight checking shall be conducted by personnel suitably qualified before the newly appointed in-charge cabin crew member operates as an operating in-charge cabin crew member on the aircraft.

Note: *When the level of turbulence so requires, and in the absence of any instructions from the flight crew, the in-charge cabin crew member should be entitled to discontinue non-safety related duties and advise the flight crew of the level of turbulence being experienced and the need for fasten seat belt signs to be switched on. This should be followed by the cabin crew securing the passenger cabin and other relevant areas if the situations so permit.*

10.2 Recurrent Training

10.2.1 In addition to the normal recurrent training, in-charge cabin crew member should also be given annual training in the management of the following scenarios:

(a) Planned crash/ditching;

(b) Unruly passengers;

(c) Crew incapacitation;

(d) Emergency first aid cases;

(e) In-flight cabin fire;

(f) Ramp safety;

(g) Dangerous goods incidents;

(h) Aviation security matters; and

(i) Use of automated external defibrillators. (if carried)

10.2.2 The in-charge cabin crew member recurrent training shall also include topics covered during the in-charge cabin crew member initial training. All topics shall be reviewed once every year during the recurrent training.

11 TRAINING HOURS AND TESTING REQUIREMENTS FOR CABIN CREW

11.1 The operator shall establish a training programme in accordance with the applicable requirements of this chapter to cover the duties and responsibilities to be performed by cabin crew members. The minimum total hours of each type of cabin crew training programme are specified as follows:

(a) Initial training – 80 hours;

(b) Recurrent training – 24 hours;

(c) Aircraft type specific training / operator conversion training– 16 hours; and

(d) Differences training – 8 hours.

11.2 Following the completion of initial, aircraft type specific/operator conversion, recurrent and differences training, each cabin crew shall undergo a test to demonstrate their proficiency in carrying out normal and emergency procedures. A theoretical test about safety and emergency procedures, operation of equipments, and first aid is required. A practical demonstration on evacuation procedures, operations of safety equipments, and door operations in emergency situations shall also be carried out by each cabin crew where possible.

11.3 Cabin crew must achieve at least 90 percent in order to pass the theoretical SEP tests. A candidate achieving less than 90 percent shall retake the test within 14 days after the date of the first test until achieving up to 90 percent. The cabin crew whose score is less than 90 percent will not be able to perform their duties as a qualified crew member.

11.4 Training and testing shall be conducted for each training course by personnel suitably qualified and experienced in the subject to be covered.

12 TERMS & CONDITIONS

12.1 In the event that the cabin crew has been recorded the aircraft type qualification in their training record, but has not performed duties as an operating cabin crew for more than three months but not exceeding twelve months, such cabin crew must re-attend and pass a recurrent training course and test according to the topics and the number of hours required by paragraphs 7, 8 and 11 of this chapter before resuming their duties.

12.2 In the event that the cabin crew has been recorded in the aircraft type qualification in their training record but has not performed his or her duties as an operating cabin crew for more than twelve months, such cabin crew must re- attend and pass an initial training course, aircraft type specific/ conversion training course and test according to the topics

and the number of hours required by paragraphs 3, 4, 5, 6 and 11 of this chapter before resuming their duties.

12.3 The result from the conduct of the cabin crew, cabin crew instructor/evaluator training that is not in accordance with the training programme approved by the Authority or conducted by the instructor who was not officially certified as a competent ground instructor by the operators shall not be treated as a part of cabin crew, instructor/evaluator's valid training record.

12.4 The operator is responsible to consistently improve and develop their cabin crew and cabin crew instructor/evaluator training programme to be up-to-date and be in accordance with safety standards, regulations and requirements of the Civil Aviation Authority of Thailand. The modified training programme must be submitted to the Authority for approval prior to the conduct of such training.

13 VIRTUAL CLASSROOM TRAINING

13.1 To conduct the theoretical parts of training according to the applicable training program/syllabus in a virtual classroom training, the air operators or the training providers should perform a risk assessment with carefully evaluations. The Guidance Material for Virtual Classroom Training also provide the guidance on designing, developing and using digital learning for virtual classroom training.

Note: See CAAT Guidance Material for Virtual Classroom Training.

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CHAPTER 7

CABIN SAFETY

1 CABIN CREW

1.1 Age/Medical Requirements

1.1.1 A cabin crew member should be at least 18 years of age and have passed an initial medical examination or assessment and been found medically fit to discharge the duties specified in the operations manual. An operator must ensure that cabin crew members remain medically fit to discharge such duties. Medical examinations or assessments are required to be renewed on an annual basis.

1.1.2 The initial medical examination or assessment, and any re-assessment, of cabin crew members should be conducted by, or under the supervision of, a medical practitioner acceptable to the Authority. An operator should maintain a medical record for each cabin crew member.

1.1.3 The following medical requirements are applicable to cabin crew members:

(a) Good general health;

(b) Freedom from any physical or mental illness which might lead to incapacitation or inability to perform cabin crew duties;

(c) Normal cardiorespiratory function;

(d) Normal centre nervous system;

(e) Adequate visual acuity - 6/9 with or without glasses and free from severe colour blindness which may interferes with the recognition of colour coded cabin signs;

(f) Adequate hearing;

(g) Normal weight (i.e. Ability to move comfortably down the aisle and to be able to exit from the smallest secondary cabin emergency exit);

(h) Normal function of ear, nose and throat; and

(i) Normal height (i.e. Able to stand in the aircraft, reach safety equipment and open and close overhead bins).

1.2 In-Charge Cabin Crew Member

1.2.1 Whenever more than one cabin crew member is carried on a flight, the operator must nominate a crew-in-charge. The in-charge cabin crew member will be responsible to the Pilot-in-Command for the conduct and co-ordination of the cabin safety and emergency procedures specified in the operations manual.

1.2.2 An operator shall not appoint a person to the post of in-charge cabin crew member unless that person has at least one year's experience as an operating cabin crew member and has completed an appropriate course of training.

1.2.3 An operator shall establish procedures to select the next most suitably qualified cabin crew member to operate as in-charge cabin crew member in the event of the nominated in-charge cabin crew member becoming unable to operate. Such procedures must be acceptable to the Authority and take into account the cabin crew member's operational experience.

1.3 Cabin Crew Complement

1.3.1 An operator shall not operate an aeroplane with a maximum approved passenger seating configuration of more than 19, when carrying one or more passengers, unless the number of cabin crew members carried on board is not less than the greatest of the following:

(a) One cabin crew member for every 50, or fraction of 50, passenger seats installed on the same deck of the aeroplane; or

(b) For an aeroplane with a single aisle, one cabin crew member for each pair of directly opposing floor level exits, and for an aeroplane with more than one aisle, one cabin crew member for each floor level exit; or

(c) The number of cabin crew members determined by the manufacturer during certification of the aeroplane, whether by an emergency evacuation demonstration or by analysis, except if the operator's maximum approved passenger seating configuration is less than the manufacturer's certificated maximum passenger seating capacity by at least 50 seats, the required cabin crew complement may be reduced by one for every whole multiple of 50 seats by which the operator's maximum seating configuration falls below the manufacturer's certificated maximum passenger seating capacity.

1.3.2 In addition to the required cabin crew complement calculated in paragraph 1.3.1 above, the Authority may, at its discretion, require an operator to include additional cabin crew members for flights such as Ultra Long-Range Operations.

1.3.3 Notwithstanding paragraph 1.3.1, in the event of unforeseen circumstances, when a cabin crew member is incapacitated, the operator may operate the aeroplane with one cabin crew member less than the required cabin crew complement subject to the following conditions:

(a) The flight is departing from a location where no qualified replacement is reasonably available;

(b) At least one cabin crew member is required for every 50, or fraction of 50, passengers present on the same deck of the aircraft;

(c) The flight shall be limited to one sector;

(d) Procedures ensuring that an equivalent level of safety is achieved with the reduced number of cabin crew, in particular for the evacuation of passengers, are established in the operations manual. This may also include reseating of passengers;

(e) All cabin crew are trained and made familiar with the procedures for reduced cabin crew operation;

(f) If the incapacitated crew is the in-charge cabin crew member, the next most qualified cabin crew shall be appointed as the in-charge cabin crew member for that sector; and

(g) A report is submitted to the Authority after completion of the flight.

1.3.4 Notwithstanding paragraph 1.3.3 (c), the Authority may approve operation of the flight with reduced cabin crew for up to two consecutive sectors, subject to conditions as he thinks fit, upon his being satisfied that such operation is conducted in a safe and proper manner.

1.3.5 Subject to paragraph 1.3.6, the operator need not comply with the requirements in paragraph 1.3.1 for the following types of flights:

(a) Test flights;

(b) Functional check flights;

(c) Base training flights;

(d) Delivery flights;

(e) Customer acceptance or demonstration flights;

(f) Flights conducted under a Ferry Flight Authorisation;

(g) Flights conducted under a Permit to Fly (note that additional conditions relating to cabin crew may be imposed in the Permit to Fly); and

(h) Any other flights approved by the Authority.

1.3.6 For flights described in paragraph 1.3.5, all persons carried on board shall be briefed on safety, emergency and evacuation procedures. In addition, for flights described in paragraph 1.3.5 where more than 19 persons are carried on board (excluding the flight crew), the operator shall determine the minimum number of cabin crew members required to affect a safe and expeditious evacuation of the aeroplane. At least one cabin crew shall be carried on board such flights.

1.3.7 When scheduling cabin crew for flights, rostering procedures should take into account the experience of each cabin crew to ensure that there is an even spread of experienced cabin crew members on all flights.

1.4 Operation on more than one type or variant

1.4.1 Cabin crew may operate up to three aircraft types provided that safety and emergency equipment and emergency procedures are similar.

1.4.2 For the purposes of paragraph 1.4.1, variants of a particular aircraft type are considered to be different types if they are not similar in all of the following aspects:

(a) Emergency exit operation;

(b) Location and type of safety and emergency equipment; and

(c) Emergency procedures.

1.4.3 Factors taken into consideration by the Authority to permit cabin crew to operate up to 3 aircraft types would include but not limited to the following:

(a) Additional training for the in-charge cabin crew member;

(b) A minimum experience level of cabin crew comprising the minimum crew complement;

(c) Restriction of the number trainee cabin crew carried on all flights;

(d) Meeting a recency requirement as agreed with the authority on all aircraft types;

(e) No change fleet assignment within the same day except for flight disruptions; and

(f) Arrangements made for cabin crew to review the characteristics of the aircraft type to be operated on during pre-flight crew briefing e.g. viewing of a video tape.

1.5 Recency

General requirements for cabin crew recency are stated in Chapter 6 of this document.

1.6 Supernumerary Flying/Familiarisation Flights

1.6.1 Unless otherwise agreed by the Authority, cabin crew will normally be expected to fly in a supernumerary role on a passenger flight within a period of 30 days on successful completion of their aircraft type specific training. This is prior to operating as a fully qualified crew. Passengers may not be able to distinguish between such trainees and fully trained cabin crew and in an emergency may expect to receive guidance and assistance from anyone wearing a crew uniform. Operators shall therefore ensure that before undertaking supernumerary duties, cabin crew have successfully completed the training and checking specified in paragraphs 3, 4, 5 and 6 of Chapter 6. The supernumerary cabin crew shall not be counted as part of the minimum crew complement.

1.7 Operator's Cabin Crew Uniforms

1.7.1 Operators shall provide crew uniforms which readily distinguish the wearer as a member of the cabin staff. The uniform to be worn by operating cabin crew shall be such as not to impede the performance of their duties as required for the safety of passengers and flight during operations, and shall allow passengers to identify the operating cabin crew including in an emergency situation.

1.7.2 Operators shall exercise care in the provision of cabin crew footwear. Appropriate footwear shall be worn during take-off, landing and emergency situations to avoid damage to slides and to offer protection to the cabin crew.

1.7.3 All ornaments worn around the neck and unconcealed by clothing have the potential to snag and hamper movement. These items may be a cause of injury to the wearer. Both the restriction of movement and the risk of injury that may occur when neck chains or scarfs are worn have the potential to inhibit crews from carrying out their duties. Operators must therefore instruct crews to remove unconcealed neck ornaments when on board aircraft. If there is a requirement that ID cards must be displayed, other forms of attachment must be used, care being taken to ensure that this does not present a risk of snagging.

1.8 Safety and Emergency Procedures (SEP)

1.8.1 On each flight, every cabin crew shall have access to a current version of every part of the Safety and Emergency Procedures (SEP) or other manuals which is relevant to his/her duties on the flight.

1.9 Signs, Markings and Placards

1.9.1 The operators should ensure that signs, markings and placards include the following characteristics, in order to be deemed suitable:

(a) Be legible;

(b) Be clearly visible;

2 CABIN SAFETY MANAGEMENT

2.1 Pre-departure Procedures

2.1.1 Operators should establish check-in and boarding gate procedures and, where applicable, training for their traffic staff and handling agents. Emphasis should be placed on the need for these personnel to identify and resolve potential difficulties in seat allocation (see also paragraphs 2.2 and 2.3 of this chapter), excess carry-on baggage, the carriage of dangerous goods, drunken or unruly passengers, including boarding refusal, before passenger embarkation begins. This is of particular importance at overseas departure points.

2.1.2 Similar instructions and training should also be given to cabin crew to deal with cabin safety related problems which may have been missed at check-in.

2.2 Seat Allocation

2.2.1 The following types of passengers should not be seated where they could obstruct floor level emergency exits, impede the crew in their duties, obstruct access to emergency equipment or hinder aircraft evacuation:

(a) Passengers with Restricted Mobility (hereinafter referred to as “PRMs”), which shall include persons with a physical or intellectual disability and persons who are impaired due to any other cause;

(b) Elderly or frail person who appear to be not capable of operating or assisting with the operation of exit;

(c) Accompanied and unaccompanied children and infant;

(d) Deportees or prisoners in custody; and

(e) Obese passengers.

2.2.2 SCPs shall be allocated seats in pre-assigned locations designated by the operator and agreed to by the Authority.

2.2.3 A passenger who would not be able to use a staircase without assistance shall not be allocated a seat in the upper deck of an aircraft where the primary means of evacuation (land or ditching evacuation) from the upper deck cabin requires the use of a staircase from the upper cabin to the main deck cabin.

2.2.4 Number of Passengers with Restricted Mobility (PRMs)

(a) Where PRMs are carried on a flight, the number of PRMs shall not exceed the number of Able-Bodied passengers (ABPs) capable of assisting with an emergency evacuation.

(b) The maximum number of PRMs permitted to be carried on any particular flight will depend on the type and configuration of the aircraft as well as extent of the reduced mobility or disability of the PRMs seeking embarkation. The approved maximum number shall not be exceeded.

2.3 Seat Allocation at Self-Help Exits

2.3.1 Seats which form the access route from the cabin aisle to these exits should only be allocated to passengers who appear capable of operating and/or assisting with the operation of the exit. Check-in staff shall be mindful of this requirement.

2.3.2 On no account should the types of passengers listed in paragraph 2.2.1 be allocated seats which form the access route from the cabin aisle to these types of exit. Preference should be given, where possible, to seating non-operating crew at these locations.

2.4 Drunken Passengers

2.4.1 Operators shall not permit a person to enter any aircraft when appeared to be intoxicated or drunk.

2.4.2 Operators are to provide instructions, advice and training to all relevant staffs on dealing with passengers who have been drinking excessively. Such advice should include when to deny boarding rights and reiterate the pilot-in-command's prerogative to exercise the powers, as conferred by the Authority regulatory requirements to protect the safety of the aircraft and passengers.

2.4.3 Drunken passengers constitute not only a possible source of annoyance to fellow passengers but also a hazard to flight safety. Potentially hazardous incidents should be reported in the incident occurrence report.

2.5 Stowage of Cabin Baggage

2.5.1 Cabin baggage may only be stowed in approved locations. Operators should provide clear and unequivocal advice on which areas are approved.

2.5.2 Overhead lockers and other stowage must be clearly placarded with weight limitations and enclosed by latched doors or load bearing nets as appropriate. Cabin crew must be made aware of the need to ensure that limitations are not exceeded.

2.5.3 Under seat stowage may only be used if the seat is equipped with a restraint bar and the baggage is of a size to fit under the seat.

2.5.4 Baggage must not be stowed in toilets, immediately forward or aft of bulkhead, or in such a manner that it will impede access to emergency equipment. Particular attention must be paid to maintaining the integrity of all evacuation routes.

2.6 Stowage of Catering Supplies and Crew Effects

2.6.1 All catering supplies, blankets, pillows, newspapers, etc. are to be securely stowed in approved areas for take-off and landing.

2.6.2 Similarly, crew effects, including baggage and clothing, must be stowed in approved areas. Particular care must be taken to ensure that doors and exits, including operating handles, are not obstructed nor ready access to emergency equipment precluded.

2.7 Carriage of Aerosols

2.7.1 Advice and instructions should be provided to crew on the carriage of aerosols. In particular, the potential fire hazard posed, and how this may be obviated by careful stowage should be emphasised.

2.7.2 Unless it is unavoidable, aerosols should not be used for dispensing air fresheners, insecticides or other similar agents.

2.8 Portable Electronic Devices (PED)

2.8.1 The operator shall not permit the use of a PED on board an aircraft except as provided for in paragraphs 2.8.2 and 2.8.3.

2.8.2 An operator may permit the use of a PED on board an aircraft:

(a) If the PED is an unintentionally transmitting PED or an intentionally transmitting PED with its transmitting function disabled, when the aircraft is operating at an altitude of above 10,000ft;

(b) After the aircraft has exited the runway upon landing;

(c) If it is a PED that has very low power consumption, such as a heart pacemaker, hearing aid or digital watch; or

(d) If it is a medical PED, such as an automated external defibrillator or a portable oxygen concentrator, that has been approved for use in the aircraft.

2.8.3 An operator may permit the use of a PED on board an aircraft in the following circumstances if he has obtained the approval of the Authority under paragraph 2.8.6:

(a) Unintentionally transmitting PED or intentionally transmitting PED with transmitting functions disabled, when the aircraft is operating at an altitude of 10,000ft or lower; or

(b) Intentionally transmitting PED with transmitting functions in active mode when the aircraft is operating at an altitude above 10,000ft.

2.8.4 Notwithstanding paragraphs 2.8.2 and 2.8.3:

(a) The operator shall not permit the use of a PED for voice communications on board an aircraft except when the aircraft has exited the runway upon landing; and

(b) The operator shall not permit the use, or shall terminate any permitted use, of a PED on board an aircraft when its use may interfere, or is suspected of interfering, with the performance of the navigation and communication systems of the aircraft.

2.8.5 The operator shall ensure that when any PED is used on board an aircraft:

(a) The use of the PED will not interfere with the performance of the aircraft's navigation and communications systems;

(b) There are established procedures for ensuring that the use of the PED complies with paragraph 2.8; and

(c) Crew members are assigned responsibilities and trained for ensuring the safe use and stowage of the PED. Should a PED initiate a fire, the cabin crew can expeditiously identify the incident, take appropriate firefighting action, and monitor the device for possible re-ignition. Operators should have dedicated resources to provide firefighting materials in the cabin and train cabin crew on how to properly respond to a PED fire.

2.8.6 The Authority may grant an approval required by an operator under paragraph 2.8.3 upon an application made by the operator with the submission of the following documents:

(a) A report of the safety risk assessment and required certification tests as necessary conducted on the tolerance of the aircraft to radio PED frequency interference to ascertain that the use of the PEDs in the required mode will not interfere with the performance of the navigations or communications systems of the aircraft;

(b) The appropriate manuals containing written procedures that include the following:

(i) The assignment of responsibilities to crew members for ensuring the safe use of PED and the appropriate actions for PED firefighting;

(ii) The procedures to isolate or prohibit to use of PED should interference from PED be suspected or is ascertained; and

(iii) The required training of the crew members.

2.8.7 The operator shall inform the passengers of the permissible times, conditions and limitations for the use of PED.

2.8.8 Notwithstanding any use of PED permitted by the operator, the Pilot-in-Command has the right to terminate the use of any PED.

2.8.9 An operator shall obtain an approval from the Authority if it provides or intends to provide a PED as part of its In-Flight Entertainment or other services on board the aircraft.

2.8.10 For the purpose of this paragraph:

(a) An intentionally transmitting PED means a PED that intentionally transmits electromagnetic signals; and

(b) An unintentionally transmitting PED means a PED that emits electromagnetic signals as a by-product of its operation.

2.9 Spillage of Drinks in Flight Deck

2.9.1 There is an obvious potential for a major incident to occur when such items as conductive liquids in open containers, cutlery, etc.; are mishandled on aircraft flight decks. All operators are requested to review their procedures for handling drinks and other items in and around the flight deck, as appropriate. Clear advice should be given to all crew on how best to route drinks when passing them about, so as to avoid any risk of accidental spillage on to electrical equipment.

2.10 Safety on the Ramp

2.10.1 An operator is required to provide procedures on the following:

(a) Use of air bridges and other means of embarkation/disembarkation for the purposes of evacuation of passengers.

(b) Allocation of responsibilities between ground handling agent and cabin crew for passenger safety during embarkation and disembarkation to ensure their individual emergency procedures are compatible and effective.

(c) Appropriate training must also be provided to all ground staff who are required to operate the aircraft door on the ramp.

2.11 Use of Cabin Crew Seat by a Person Other than a Cabin Crew

2.11.1 The operator shall not permit a cabin crew seat to be occupied by a person other than a cabin crew except in accordance with 2.11.2 below.

2.11.2 An operator may, subject to the approval of CAAT indicated in the operator's Operations Manual, permit a person other than a Cabin Crew to occupy a Cabin Crew Seat for landing only if:

(a) The number of cabin crew manning emergency exits falls below the minimum cabin crew complement during flight due to unexpected crew incapacitation; or

(b) During a declared emergency where the person is an able-bodied passenger displaced from a passenger seat to a cabin crew seat in order to enhance evacuation management. This person must be briefed on the necessary safety procedures, including activation of the exit door, etc., before being permitted to occupy a cabin crew seat and to assist in evacuation management.

2.12 Egress and Evacuation Routes

2.12.1 The operator shall ensure that the passenger's egress and evacuation routes are free of obstructions during take-off and landing.

3 SAFETY BRIEFING

3.1 Passenger Briefing

3.1.1 Passengers are to be given a pre-departure briefing, without distraction by other cabin activities. The briefing should cover all relevant points appropriate to the aircraft type and operation being undertaken. Briefings are to be given in English, and in any other language where passenger demography so requires. When audio video presentation is utilised, the audio text is to be in English, with each text accompanied by synchronised sub-titles of the language where passenger demography so requires. The following points must also be highlighted in the demonstration or video:

(a) Seat belt operation;

(b) Location of emergency exits, including any unserviceability;

(c) Life-jacket operation, where required; and

(d) Operation of drop-out oxygen, where required.

Passengers' attention must be drawn to smoking restrictions; when appropriate, the availability of infant life-jackets or flotation device; the need for children's and babies' oxygen masks to be fitted after those of their accompanying elders; and advice on wearing seat belts at all times.

3.1.2 The location of floor lighting systems must be included in the briefing and, where possible, the system should be activated for a few seconds.

3.1.3 Passenger's attention should be drawn to the safety card and mention made of the instructions for operating any types of exits doors.

3.1.4 Attention should also be drawn to restrictions on the use of personal electronic devices, including mobile telephones. This is to be repeated prior to landing.

3.1.5 Where briefings are given by the use of a video presentation, cabin crew must monitor screens to ensure that each passenger receives a full briefing. In larger aircraft, it is preferable that cabin crew should also physically indicate the nearest available exit to the

passenger during the briefing. Where passengers have not received, or cannot receive (because of location), a full briefing by video, individual briefings must be given.

3.1.6 Operators should ensure that their crew drills include a procedure for passengers to be warned of impact so that they can adopt the brace position at the appropriate time before impact.

3.1.7 Special personalised briefings for handicapped passengers (e.g. the blind, the hearing impaired and to a passenger who is responsible for another person on board (e.g. infants) should also be carried out).

3.1.8 Prior to landing, another passenger briefing must also be carried out to cover the following:

(a) Carry-on baggage stowage;

(b) Seat belt requirements;

(c) The use and stowage of PEDs; and

(d) Correct stowage of passenger seat features (e.g. tray tables, armrests, TV monitors, and etc.)

3.1.9 The operator shall ensure that in an emergency during flight, passengers are instructed in such emergency action as may be appropriate to the circumstances.

3.1.10 The operator shall ensure that, during taxi, take-off and landing and whenever considered necessary by reason of turbulence or any emergency occurring during flight, all passengers on board an aeroplane shall be secured in their seats by means of the seat belts and/or harnesses, when provided.

3.2 Passenger Safety Cards

3.2.1 The passenger safety briefing must be supplemented with a pictorial safety notice relevant to the type of aircraft and its safety equipment (passenger safety card). Information contained in the card must be lodged with the Authority.

3.2.2 The card is to be designed and produced as an entity separate from any other literature. It should be located so that each seated passenger can readily see and identify it. A distinctive message that it contains safety information should be placed at the top of the card.

3.2.3 Equipment and operating methods should be depicted pictorially, using internationally recognised symbols wherever possible. The card should include colours to draw the attention of the passengers (e.g. green for means of escape and positive instructions). Any wording should be kept to a minimum.

3.2.4 Passenger safety cards must provide the following information:

(a) Seat belts and/or shoulder harnesses - instructions for fastening, adjusting and unfastening;

(b) Useable exit location - routes to exits should be indicated for crash landing and ditching. This includes over wing emergency exits where the emergency escape routes from the cabin, via the wing to the ground should also be clearly depicted;

(c) Exit operation - for all types of exit fitted. Illustrations should depict the operation with the direction of the movement of exits and handles clearly indicated;

(d) Use of evacuation slides - depicting the correct method of use, inflation and detachment, the manual inflation handle and discarding high heeled shoes;

(e) Brace positions - for all types of seat orientation and pitch in use of the aircraft;

(f) Oxygen masks - instructions of locating, donning and adjusting the mask; initiating oxygen flow. Instructions should be given that masks should be fitted to children only after their guardians have fitted their own;

(g) Life-jackets - location, removal from stowage, removal from container and inflation. The card must show that, excepting children, the life-jackets must not be inflated within the cabin;

(h) Life-raft - location, removal, preparation for use; inflation and launching. Launching locations should be indicated;

(i) Smoking restrictions;

(j) PED restrictions;

(k) Correct stowage of passenger's seat feature (e.g. tray tables, armrests, TV monitors, and etc.)

(l) Emergency floor path lighting systems;

(m) Cabin baggage stowage in approved locations during taxi, take-off and landing; and

(n) Use of child restraint systems for safety of infants and small children (if applicable).

4 CABIN CREW DUTIES

4.1 Pre-flight Briefings

4.1.1 Cabin crew shall be given a safety briefing prior to the commencement of any flight or a series of consecutive flights, after each full rest period. Consideration shall be given to the following:

(a) Areas dedicated to pre-flight briefings usage that afford privacy for each individual briefing shall be provided;

(b) Access to the relevant safety and emergency procedure manual and current safety notices must be available;

(c) Cabin crew shall answer satisfactorily at least one question on aircraft safety (e.g. emergency drills, safety and emergency equipment location and usage, etc.) or one on first aid;

(d) The allocation of cabin crew to specific seats in the passenger compartment, where applicable, shall take due account of the need to ensure the conduct of safety-related duties;

(e) Safety reminders that address any recent changes to safety-related issues or any perennial problems shall be given; and

(f) Action to be taken by the in-charge cabin crew member, if it becomes apparent that any crew member displays inadequate knowledge of safety-related issues.

4.2 Allocation of Cabin Crew Stations

Arrangements should be made, preferably during rostering, to ensure an even spread of experienced cabin crew through the aircraft. The in-charge cabin crew members should allocate duties and positions on the day with this in mind. The in-charge cabin crew member must occupy an approved crew seat for all take-offs and landings.

4.3 In-Charge Cabin Crew Member Seating

When the assigned crew station of the in-charge cabin crew member does not allow immediate access to the flight deck, operators must specify drills which reflect the following:

(a) The cabin crew seated closest to the flight deck should be responsible for communicating with the flight deck crew in the event of any emergency on take-off or landing; and

(b) Emergency evacuation procedures should require in-charge cabin crew member to remain at his or her station and to control and operate the emergency exits.

4.4 Checking of Safety and Emergency Equipment

4.4.1 Cabin crew operating a flight must ensure all the safety and emergency equipment carried on board the aircraft is in working condition and that their location and complement are in accordance with the operations manual. The checking of safety and emergency equipment is also to be carried out whenever there is a change of crew.

4.5 Embarkation and Disembarkation of Passengers

4.5.1 Instructions should be available to crews for marshalling of passengers at stations where ground handling staff are unavailable.

4.6 Arming and Disarming Slides

4.6.1 Slides should be armed as soon as obstructions to their deployment (steps, jetties, etc.) are removed and clear. Slides should remain armed after landing until aircraft comes to complete stop and command received. Crews should be aware of the dangers of accidental deployment.

4.7 Duties Prior to Take-off and Landing

4.7.1 Each cabin crew member assigned to emergency evacuation duties shall occupy an approved cabin seat in the passenger cabin during take-off and landing. Cabin crew should remain at their stations with their seat belts and safety harness, fastened, except when performing duties related to the safety of the aircraft and passengers.

4.7.2 The operator shall not permit a cabin crew seat to be occupied during take-off and landing by a person other than a functional cabin crew member unless otherwise approved by the Authority.

4.7.3 All catering and other equipment shall be stowed prior to take-off and landing.

4.7.4 All items of galley electrical equipment should be switched off prior to take-off and landing.

4.7.5 The operator shall ensure that at any time when the aircraft is on the ground, provision for the safety and rapid evacuation of the passengers in an emergency is maintained.

4.8 Cabin Lights and Window Shades for Take-off and Landing

4.8.1 The dimming of interior cabin lights particularly when taking-off and landing at night and stowing of passengers' window shade in the open position (when applicable) for take-off and landing shall be carried out.

4.9 Refueling Operations with Passengers on Board

4.9.1 When operators wish to refuel aircraft with passengers on board, instructions should be issued to crews. Instructions should cover at least the following points:

(a) Aircraft steps and jetties and cabin crew positions;

(b) Smoking prohibition;

(c) Briefing to passengers on restrictions on use of electrical equipment, no smoking rule, etc.;

(d) Slide arming and clearance area;

(e) Ensure seat belt signs are off to facilitate sudden evacuation; and

(f) Ensure cabin safety lighting is switched on.

4.10 Flight Crew and Cabin Crew Liaison

4.10.1 Operator's instructions should be clear on the need for good liaison to exist between flight and cabin crew.

4.10.2 A means must be established for the conduct of liaison. Such liaison should extend until after the aircraft has arrived at its final destination where, for instance, cabin safety equipment defects may need to be attended to.

4.11 Carry-on Baggage

4.11.1 The operator shall ensure that all baggage carried onto an aeroplane and taken into the passenger cabin is adequately and securely stowed.

4.12 Child Restraint Systems

4.12.1 The operator should ensure that babies under two years of age and small children are best protected and secured in a child restraint system appropriate for their weight and height and tailored to be suitable for the operator's safe operations. Information on policies and procedures related to the use of such devices should be provided to parents, cabin crew and ground personnel.

5 SAFETY, EMERGENCY AND SURVIVAL EQUIPMENT

5.1 Provision of Oxygen Equipment

5.1.1 The amount of oxygen to be carried and the number of passengers for whom suitable masks must be made available vary with operating altitude, attainable rate of descent and Minimum Safe Altitude (MSA).

5.1.2 Information and instructions must be provided by the operator to his operating staff to ensure that flights may be conducted in accordance with the relevant legislation. Any aircraft which is not correctly equipped must be appropriately restricted in its use, e.g. by imposition of operating altitude or route restrictions, until such time as an appropriate scale of oxygen and equipment is fitted or repairs effected.

Note: *Information on the dangers of explosion caused by the proximity of any oxygen equipment, including therapeutic oxygen, to any naked flame or incipient fire must be stressed.*

5.1.3 The Operator shall establish the procedures to ensure the use of cabin crew and passenger oxygen in the event of loss of pressurisation.

5.1.4 Where a Pre-recorded Announcement facility is fitted, operators should review post decompression procedures and public address announcements to ensure that passengers receive information relevant to the use of the oxygen system as soon as possible after a decompression.

5.2 Re-stowage of Oxygen Masks

5.2.1 It is recommended that cabin crew do not attempt to re-stow oxygen masks after deployment. Damage to the equipment and possibly cabin crew injury may result. Re-stowage of such equipment should be undertaken by maintenance personnel only.

5.3 Waste Containment

5.3.1 All receptacles for towels, paper and other waste are to be constructed of materials resistant to fire as required by the relevant airworthiness requirements.

5.3.2 Waste bags do not need to be approved by the Authority. It is, however, the responsibility of the operator to control the quality of their waste bags in order that resistance to fire is maintained. The fire containment must be demonstrated with a test.

5.3.3 Waste bags may only be stowed in toilet compartments during the final phases of flight, provided that they contain low density waste such as paper and plastic cups.

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6 ABNORMAL AND EMERGENCY PROCEDURES

6.1 Turbulence

6.1.1 If turbulence is forecast, the Pilot-in-Command should brief cabin crew member prior to departure.

6.1.2 When turbulence is encountered, the Pilot-in-Command should direct appropriate action via the in-charge cabin crew member.

6.1.3 If in-flight service is to be discontinued, whenever possible, without imperiling personal safety, cabin crew should undertake to ensure that service equipment is secured and passengers are seated with their seatbelts fastened.

6.1.4 Cabin crew should take their seats and fasten their seat harness as soon as possible.

6.2 Cabin Fires

6.2.1 Cabin crew must continually survey the aircraft cabin and galley areas for potential and existing fires.

6.2.2 Additionally, a frequent check of toilet areas must be undertaken, ensuring in particular that smoke sensors remain unblocked. These checks should be conducted every 20-30 minutes.

6.2.3 On detecting a fire and/ or smoke, the flight crew must be informed immediately of its location, source and severity and be kept informed as the situation develops.

6.2.4 After a fire has been extinguished, the area around it must be monitored for potential re-ignition.

6.3 Oven Fires

6.3.1 Oven fires can be caused by a variety of factors, and the dangers of which would be minimized by thorough inspections of ovens both for cleanliness and for the presence of foreign objects.

6.3.2 The primary hazard from an oven fire occurs when the door of a heated oven is opened. The introduction of outside oxygen can cause a flash fire. In dealing with an oven fire or oven overheat, the following procedure are recommended:

(a) Isolate the electrics and keep the door closed. In most incidents, the fire will self-extinguish;

(b) Monitor the situation. Have a fire extinguisher, fire gloves and Protective Breathing Equipment (PBE) at hand; and

(c) If the situation worsens, or it is thought that fire still exist in the oven, open the oven door just enough to insert the nozzle of the fire extinguisher. Insert the nozzle of the fire extinguisher and discharge a small amount of the extinguisher; consideration

should be given to donning PBE and fire gloves prior to opening the oven door. Close the oven door and monitor the oven. Repeat this procedure if necessary.

6.4 Precaution on the Use of Therapeutic Oxygen

6.4.1 The use of therapeutic oxygen whilst fire-fighting is extremely hazardous since therapeutic oxygen may itself feed the fire, thus resulting in severe injuries to the crew member wearing the equipment. Additionally, therapeutic oxygen equipment only provides a low supplemental oxygen flow which will afford little relief in a smoke-laden atmosphere.

6.5 Pressurised Cabins - Use of Exits

6.5.1 Problems can occur if an exit is forced open when the aeroplane has not been fully depressurised. The exit will rapidly open, with the associated danger that the person operating the exit may be ejected from the cabin with possible serious consequences. Residual pressurisation may result from system malfunction or incorrect application of procedures.

6.5.2 Prevention of accidents and incidents involving aeroplane pressurisation requires correct actions to be taken by both flight deck crew and cabin crew. Operators are required to ensure flight deck crew and cabin crew are able to recognise any indication that the aeroplane is pressurised and that any attempt to open the exits should only be made when complete depressurisation has been achieved. Indication of a pressurisation problem might be evident by system design or by abnormally high operating loads on the exit handle.

CHAPTER 8

ADDITIONAL REQUIREMENTS FOR HELICOPTERS

1 PURPOSE

1.1 This Chapter contains additional requirements that operators and Pilot engaged in helicopter operations for the purpose of public transport shall comply with to qualify for and maintain the operators' AOC.

2 HELIPORT OPERATING MINIMA

2.1A General

2.1A.1 An operator shall establish heliport operating minima for each heliport that is used by the operator for its operations. The method of determination of such minima shall be subject to the approval of the Authority. Such minima shall not be lower than any that may be established for such heliports by the State in which the heliport is located, except when specifically approved by that State. For details on Low Visibility Operations – Training Qualifications can be found in Appendix L of this document.

Note:- *Operations with lower visibilities than normally associated with the helicopter operating minima may only be allowed on a helicopter with HUD and/or EVS if approval has been obtained in accordance to paragraph 2.9.1 of this Chapter.*

2.1A.2 The operator of Thai registered helicopter shall establish the heliport or landing location operating minima which will apply to any particular operation and shall take full account of:

(a) The type, performance and handling characteristics of the helicopter and any conditions or limitations stated in the flight manual;

(b) The composition of the flight crew, their competence and experience;

(c) The dimensions and characteristics of the Final Approach and Take-Off Areas (FATO)/runways which may be selected for use;

(d) The adequacy and performance of the available visual and non-visual ground aids;

(e) The equipment available on the helicopter for the purpose of navigation and/or control of the flight path during the take-off, the approach, the flare, the hover, the landing, the roll out and the missed approach;

(f) The obstacles in the approach and missed approach areas and the obstacle clearance altitude/height for the instrument approach procedures;

(g) The means used to determine and report meteorological conditions;

(h) The obstacles in the climb-out areas and necessary clearance margins;

(i) the conditions prescribed in the operations specifications; and

(j) any minima that may be promulgated by the State of the Aerodrome.

2.1B Helicopter Operating Minima (Operations under IFR)

2.1B.1 An operator shall classify instrument approach operations based on the designed lowest operating minima below which an approach operation shall only be continued with the required visual reference as follows:

(a) Type A: a minimum descent height or decision height at or above 75 m (250ft); and

(b) Type B: a decision height below 75 m (250ft). Type B instrument approach operations are categorised as:

(i) Category I (CAT I): a decision height not lower than 60 m (200ft) and with either a visibility not less than 800 m or a runway visual range not less than 550 m;

(ii) Category II (CAT II): a decision height lower than 60 m (200ft) and with either a visibility not less than 30 m (100ft) and a runway visual range not less than 300 m;

(iii) Category III (CAT III): a decision height lower than 30 m (100 ft) or no decision height and a runway visual range less than 300 m or no runway visual range limitations.

Note 1:- *Where Decision Height (DH) and Runway Visual Range (RVR) fall into different categories of operation, the instrument approach operation would be conducted in accordance with the requirement of the most demanding category (e.g. an operation with a DH in the range of CAT III but with a RVR in the range of CAT III would be considered a CAT III operation or an operation with a DH in the range of CAT II but with an RVR in the range of CAT I would be considered a CAT II operation). This does not apply if the RVR and/or DH has been approved as operational credits.*

Note 2:- *The requirement visual reference means that section of the visual aids or of the approach area which should have been in view of sufficient time for the Pilot-in-Command to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In the case of a circling approach operation the requirement visual reference is the runway environment.*

Note 3:- *Guidance on approach classification as it relates to instrument approach operations, procedures, runways and navigation systems is contained in the All Weather Operations Manual (Doc 9365).*

2.1B.2 An operator shall not conduct instrument approach operations in low visibility which shall only be conducted when RVR information is provided unless specific approval by the Authority is obtained.

Note:- *Guidance on low visibility operations is contained in the Manual of All-Weather Operations* (*Doc 9365*).

2.1B.3 For take-off in low visibility, the operator of Thai registered helicopter shall obtain specific approval for the minimum take off RVR from the Authority.

Note:- *In general, visibility for take-off is defined in terms of RVR. An equivalent horizontal visibility may also be used.*

2.1B.4 An operator shall determine the operating minima for 2D instrument approach operations using instrument approach procedures establishing a Minimum Descent Altitude (MDA) or Minimum Descent Height (MDH), minimum visibility and, if necessary, clued conditions.

Note:- *For guidance on applying a Continuous Descent Final Approach (CDFA) flight technique on non-precision approach procedures refer to PANS-OPS (DOC 8168), Volume I, Section 1.7.*

2.1B.5 An operator shall determine the operating minima for 3D instrument approach operations using instrument approach procedure by establishing a Decision Altitude (DA) or Decision Height (DH) and the minimum visibility or RVR.

2.2 Take-off Minima

2.2.1 The operator shall establish take-off minima and the relevant visibility or Runway Visual Range (RVR) limits, taking into account all relevant factors for each heliport planned to be used and the helicopter characteristics. Where there is a need to see and avoid obstacles on departure and/or a forced landing, additional conditions (e.g. ceiling) must be specified.

2.2.2 The Pilot-in-Command shall not commence take-off unless the weather conditions at the heliport of departure are equal to or better than applicable minima for landing at that heliport unless a suitable take-off alternate heliport is available.

2.2.3 When the reported meteorological visibility is below that required to take-off and the RVR is not reported, a take-off may only be commenced if the Pilot-in-Command can determine that the RVR and visibility along the take-off FATO and runway is equal to or better than the required minima.

2.2.4 When no reported meteorological visibility or RVR is available, a take-off may only be commenced if the Pilot-in-Command can determine that the RVR and visibility along the take-off FATO and runway is equal to or better than the required minima.

2.2.5 The take-off minima must be selected to ensure sufficient guidance to control the helicopter in the event of both a discontinued take-off in adverse circumstances and a continued take-off after failure of a critical power-unit.

2.2.6 An operator shall not conduct night operations without ground lighting to illuminate the FATO, runway and any obstacle unless otherwise agreed by the Authority.

2.3 Required RVR/Visibility

2.3.1 For operations in performance Class 1, an operator shall establish an RVR and visibility respectively (RVR/VIS) as take-off minima in accordance with Table 1 in Appendix T.

2.3.2 For operations in performance Class 2, the take-off minima shall be 800 m RVR/Vis. In addition, the operator shall instruct Pilots-in-Command to remain clear of cloud during the take-off maneuver until reaching Performance Class 1 capabilities.

2.4 Non-Precision Approach

2.4.1 An operator shall ensure that system minima for non-precision approach procedures, which are based upon the use of Instrument Landing Systems (ILS) without glide path (LLZ only), Very high frequency Omni-directional Radio range (VOR), Non-Directional Beacon (NDB), Surveillance Radar Approach (SRA), and very high frequency Direction-Finding (VDF) are not lower than the Minimum Descent Height (MDH) values given in Table 2 in Appendix T.

2.4.2 An operator shall ensure that the minimum descent height for a non-precision approach is not lower than either:

(a) The Obstacle Clearance Height/ Limit (OCH/OCL) for the category of helicopter; or

(b) The system minimum.

2.4.3 A pilot may not continue an approach below minimum descent altitude (MDA)/minimum descent height (MDH) unless at least one of the following visual references for the intended FATO/runway is distinctly visible and identifiable to the pilot:

(a) Elements of approach light system;

(b) The threshold;

(c) The threshold markings;

(d) The threshold lights;

(e) The threshold identification lights;

(f) The visual glide slope indicator;

(g) The touchdown zone or touchdown zone markings;

(h) The touchdown zone lights;

(i) FATO/Runway edge lights; or

(j) Other visual references accepted by the Authority.

2.4.4 For non-precision approaches by helicopters operating in Performance Class 1 or in Performance Class 2, the required RVR minima given in Table 3 in Appendix T shall apply.

2.4.5 When the missed approach point is within 0.5 NM of the landing threshold, the approach minima given for full facilities may be used regardless of the length of approach lighting available. However, FATO/runway edge lights, threshold lights, end lights and FATO/runway markings are still required.

2.5 Precision Approach - Category I Operations

2.5.1 A Category I operation is a precision instrument approach and landing using ILS, Microwave Landing System (MLS) or Precision Approach Radar (PAR) with a decision height not lower than 200 ft and with a runway visual range not less than 500 m.

2.5.2 An operator must ensure that the decision height to be used for a Category I precision approach is not lower than:

(a) The minimum decision height specified in the helicopter flight manual if stated;

(b) The minimum height to which the precision approach aid can be used without the required visual reference; or

(c) The OCH/OCL for the category of helicopter or 200 ft.

2.5.3 A pilot may not continue the approach below the Category I decision height, determined in accordance with sub-paragraph 2.5.2 above, unless one of the following visual references for the intended runway is distinctly visible and identifiable to the pilot:

(a) Elements of approach light system;

(b) The threshold;

(c) The threshold markings;

(d) The threshold lights;

(e) The threshold identification lights;

(f) The visual glide slope indicator;

(g) The touchdown zone or touchdown markings;

(h) The touchdown zone lights; or

(i) FATO/runway edge lights.

2.5.4 For Category I helicopters operations, the minima contain in Table 4 in Appendix T shall apply.

2.5.5 For night operations, ground lighting must be available to illuminate the FATO/runway and any obstacles unless otherwise agreed by the Authority.

2.6 Visual Flight Rules Operating Minima

2.6.1 An operator shall ensure that:

(a) Flights conducted in accordance with Visual Flight Rules (VFR) are in accordance with the minimum visibilities for VFR operations stated in Table 5 in Appendix T;

(b) Helicopters are operated in flight visibility of not less than 1,500 m during daylight and not less than 5 km by night. Low level overwater flights out of sight of land are only to be conducted under VFR when the cloud ceiling is greater than 600 ft. by day and 1,200 ft. by night;

(c) Notwithstanding paragraph 2.6.1(b), in class G airspace, when flying between helidecks where the over water sector is less than 10 km, VFR flights shall be conducted in accordance to Table 6 in Appendix T; and

(d) Notwithstanding paragraph 2.6.1(b), flights operating under special VFR conditions comply with the zone minima in force.

2.7 Onshore Circling

2.7.1 The specified MDH for onshore circling shall not be less than 250 ft, and the meteorological visibility shall not be less than 800m.

***Note*:-** *Visual maneuvering* (*circling*) *with prescribed tracks is an accepted procedure within the meaning of this paragraph.*

2.8 Airborne Radar Approach (ARA)

2.8.1 An operator shall not conduct an ARA unless authorised by the authority.

2.8.2 The operator shall establish procedures for the conduct of ARAs. An ARA shall not be conducted unless:

(a) The radar can provide course guidance to the Pilot-in-Command to ensure obstacle clearance;

(b) The Pilot-in-Command can ensure a clear path exists on the radar screen for the final and missed approach segments before commencing the final approach. If lateral clearance from any obstacle is less than 1.0 NM, the Pilot-in-Command shall:

(i) Approach to a nearby target structure and thereafter proceed visually to the destination structure; or

(ii) Make the approach from another direction leading to a circling maneuver.

(c) The cloud ceiling above the helideck is sufficiently clear to permit a safe landing.

2.8.3 An ARA shall not continue beyond Decision Range or below MDH/MDA unless he is visual with the destination. The decision range shall not be less than 0.75 NM unless an operator has demonstrated to the Authority that a lesser Decision Range can be used at an acceptable level of safety.

2.8.4 Flights using ARAs are not permitted to rigs or vessels under way unless the flight crew consists of at least 2 pilots.

2.8.5 The operator shall establish the Minimum Descent Height (MDH) using a radio altimeter. The MDH shall not be less than 50 ft above the elevation of the helideck and:

(a) For an ARA shall not be lower than:

(i) 200 ft by day; and

(ii) 300 ft by night

(b) For an approach leading to a circling maneuver shall not be lower than:

(i) 300 ft by day; and

(ii) 500 ft by night

2.8.6 An MDA shall be used if the radio altimeter is unserviceable. The MDA shall be a minimum of the MDH plus 200 ft and shall be based on a calibrated barometer at the destination or the lowest forecast QNH for the region.

2.9 Helicopters equipped with automatic landing systems, HUD, EVS, SVS or CVS

2.9.1 Operational credit(s) for operations with helicopters equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS shall be authorized by the Authority. Where the operational credit relates to low visibility operations, the operator shall obtain a specific approval from the Authority. Such authorizations shall not affect the classification of the instrument approach procedure.

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3 LOW VISIBILITY OPERATIONS

3.1 General

3.1.1 An operator shall not conduct any low visibility take-off unless otherwise approved by the Authority.

3.1.2 An operator shall not conduct Category II or III operations unless:

(a) The helicopter involved in the conduct of the operations is certified for operations with decision heights below 200 feet;

(b) The operator has established and maintains a system for recording the success rate for approach or automatic landing to monitor the overall safety of the operations;

(c) The helicopter is piloted by at least 2 pilots qualified for low visibility operations;

(d) Decision Height is determined by means of a radio altimeter; and

(e) Runway Visual Range (RVR) is made available to the Pilot-in-Command.

3.1.3 An operator wishing to conduct low visibility take-off, Category II and III operations must establish relevant training requirements and operational procedures approved by the Authority for the conduct of such operations. The procedures shall be contained in the Operations Manual. Refer to Appendix U for Low Visibility Operations.

3.2 Heliport

3.2.1 An operator shall not use a heliport for Category II or III operations unless:

(a) The heliport is approved for such operations by the State in which the heliport is located; and

(b) The heliport has established low visibility procedures for the purpose of low visibility operations.

3.3 Responsibilities of Pilot-in-Command

3.3.1 The Pilot-in-Command shall not conduct low visibility take-off, Category II and III operations unless he is satisfied that:

(a) The status of the helicopter and the relevant airborne systems is appropriate for the specific operations to be conducted;

(b) The status of the visual and non-visual facilities is sufficient prior to commencing a low visibility take-off or a Category II or III approach;

(c) The appropriate low visibility operating procedures are in force according to information received from air traffic services before commencing a Low Visibility Take-off or a Category II or III approach; and

(d) The flight crew members conducting the low visibility take-off or a Category II or III operation are properly qualified to do so.

3.4 Minimum Equipment

3.4.1 An operator shall include in the Operations Manual the minimum equipment that has to be serviceable at the commencement of a low visibility take-off or a Category II or III approach in accordance to the Helicopter Flight Manual.

4 FUEL PLANNING AND MANAGEMENT

4.1 Fuel Planning

4.1.1 An operator shall not commence a flight unless, taking into account both the meteorological conditions and any delays that are expected in flight, the helicopter carries sufficient fuel and oil to ensure that it can safely complete the flight. In addition, fuel reserves shall be carried to provide for contingencies.

4.1.2 A minimum in-flight indicated fuel state shall be set down for each type of helicopter and operation, particularly for specialised activities, such as aerial crane work and winching operations.

4.1.3 Operators operating helicopters equipped for cross-feeding or balancing of fuel in flight shall ensure that cross-feeding or fuel balancing procedures are contained in the operations manual.

4.2 VFR Flights

4.2.1 For flights by day operated under VFR over non-hostile terrain (i.e. where a forced landing may be carried out with a high degree of confidence that there is not likely to be a consequential survival problem), the total fuel carried must be sufficient for at least:

(a) Start-up and taxi (this may be a standard fixed amount);

(b) The route from departure point to destination;

(c) Holding at destination for at least 20 minutes (at endurance speed); and

(d) Contingency purposes. Contingency reserve shall be 5% of fuel require for the route. Extra fuel may be carried at the discretion of the Pilot-in-Command.

4.2.2 Flights taken on a VFR fuel formula above may not carry out flight under IFR unless all the fuel requirements outlined in paragraph 4.3 are met when flight in IFR starts.

4.3 IFR Flights

4.3.1 For flights operated under IFR, offshore and over hostile terrain (i.e. where forced landings are not possible or which present a consequential survival problem.); the total fuel carried must be sufficient for at least:

(a) Start-up and taxi (this may be a standard fixed amount);

(b) The route from departure point to destination;

(c) One go-around;

(d) Re-route to an alternate, including diversion to a suitable alternate using a suitable altitude (at least the MSA), unless otherwise approved by the Authority. When no suitable alternate is available (e.g. the destination is isolated), sufficient fuel shall be carried to enable the helicopter to fly for a period that will, based on geographic and environmental considerations, enable a safe landing to be made;

(e) 30 minutes of holding at endurance speed at 450 m (1,500 ft) above the alternate under standard temperature conditions. Additional fuel may be required in areas where air traffic delays are likely to occur; and

(f) Contingency purposes. Contingency reserve shall be at least 10% of the total fuel required for Paragraphs 4.3.1 b), c) and d). Extra fuel may be carried at the discretion of the Pilot-in-Command.

4.3.2 Provided the sum total of reserve fuel carried is not less than that stated in paragraph 4.3.1e) and f), operators may define their own fuel formulae to be included in their operations manual.

4.3.3 For flights departing from offshore installations and vessels connected with the exploitation of oil, gas and mineral resources to certain land aerodromes, requirements pertaining to fuel for contingency purposes may be waived, subject to approval by the Authority, if at the fuel planning stage, the forecast and the latest information available to the Pilot-in-Command indicates that the cloud ceiling and visibility at destination will:

(a) By day, be at least 600 ft. above the surface with 4 km visibility and no probability of temporary or intermittent deterioration; or

(b) By night, 1,200 ft. above the surface with 5 km visibility and no probability of temporary or intermittent deterioration.

4.4 Safety Measures for Refueling

4.4.1 A helicopter shall not be refueled when passengers are embarking, on board, or disembarking.

4.4.2 Notwithstanding paragraph 4.4.1, a helicopter may be refueled with passengers on board if the helicopter is undertaking ambulance or life-saving operations or when prevailing weather conditions may cause significant disembarkation and embarkation risks, provided the following conditions are met:

(a) All main exits should be available for immediate use;

(b) The external area adjacent to the exits are kept clear;

(c) Two-way communications are maintained at all times between the ground crew supervising the fueling and the pilot; and

(d) In case of helicopters where only the normal exit is on the same side as the fueling point filler caps, then 'rotors or engine running' fueling with passengers on board is not permitted.

4.4.3 A helicopter shall not be fueled at onshore and offshore sites while the engines or rotors are running, unless:

(a) The helicopter is undertaking ambulance and other emergency missions requiring extreme urgency;

(b) Severe weather conditions make it inadvisable to stop engines/rotors;

(c) Due to adverse and unusual operational requirements at the Pilot-in-Command's discretion and with agreement of the fueling undertaker; and

(d) Due to special operational requirements and after a risk assessment for the special operation has been carried out by the operator and approved by the Authority.

4.4.4 Fueling offshore must only be carried out from helicopter landing areas approved by the Authority. Operators should ensure good fire safety practices at all times fueling takes place, including the provision of rescue and firefighting personnel.

***Note*:-** *Further guidance on helicopter fueling can be found in ICAO Heliport Manual-Doc. 9261-AN/903/2.*

5 ALTERNATE HELIPORTS

5.1 General

5.1.1 An operator shall establish procedures for the selection of destination and alternate heliports when planning a flight. An operator shall only authorise use of heliports that are adequate for the type(s) of helicopter and operation(s) concerned.

5.2 Take-off Alternate Heliports

5.2.1 The operator shall select and specify a take-off alternate heliport in the operational flight plan if the weather conditions at the heliport of departure are at or below the applicable heliport operating minima. For a heliport to be selected as a take-off alternate heliport, available information shall indicate that the conditions at the estimated time of use are at or above the heliport operating minima for that operation.

5.3 Destination Alternate Heliports

5.3.1 An operator conducting a flight in accordance with IFR shall specify at least one destination alternate in the operational flight plan and the flight plan, unless:

(a) The duration of the flight and the meteorological conditions prevailing are such that there is reasonable certainty that, at the estimated time of arrival at the heliport of intended landing, and for a reasonable period before and after such time, the approach and landing may be made under visual meteorological conditions; or

(b) The heliport of intended landing is isolated and no suitable alternate is available. A point of no return (PNR) shall be determined.

5.3.2 For a heliport to be selected as a destination alternate, the available information shall indicate that, at the estimated time of use, the conditions will be at or above the heliport operating minima for that operation.

5.3.3 For a flight departing to a destination which is forecasted to be below the heliport operating minima, two destination alternates should be selected. The first destination alternate should be at or above the heliport operating minima for destination and the second at or above the heliport operating minima for alternate.

5.4 Selection of Offshore Alternates

5.4.1 An offshore alternate shall not be selected unless the operator has published the selection procedures in the operations manual, which has been approved by the Authority. The dimensions, configuration and obstacle clearance of individual helidecks or other sites shall be assessed in order to establish operational suitability for use as an offshore alternate by each helicopter type proposed to be used.

5.4.2 Offshore alternates may be specified subject to the following conditions:

(a) An offshore alternate shall be used only after the helicopter has flown beyond a PNR. Prior to PNRs onshore alternates shall be used;

(b) One engine inoperative landing capability shall be attainable at the alternate;

(c) Deck availability shall be guaranteed. The operator shall establish procedures for guaranteeing the availability of the helideck. Where there is the possibility of the helideck being out of use due to another aircraft being scheduled to land on the helideck or for any other circumstance, the operator must seek another suitable alternate;

(d) Weather minima shall be established taking into account the accuracy and reliability of meteorological information; and

(e) The MEL shall reflect essential requirements for this type of operation.

5.4.3 When operating offshore, any spare payload capacity should be used to carry additional fuel if it would facilitate the use of an onshore alternate heliport.

5.5 Offshore Alternate Deck Landing Environment, Performance and Weather Considerations

5.5.1 An operator shall provide information on the landing environment of a helideck that is proposed for use as an offshore alternate, including the physical characteristics of the helideck (including the orientation of the helideck), the effect of the wind direction and strength and turbulence. This information shall be made available to the Pilot-in-Command both at the planning stage of the flight and in the flight, and should be published in an appropriate form in the operations manual, such that the suitability of the helideck for use as an offshore alternate can be assessed.

5.5.2 The operator shall establish that the offshore alternate helideck meets the criteria for size and obstacle clearance appropriate to the performance requirements of the type of helicopter concerned.

5.5.3 The use of an offshore alternate shall be restricted to helicopters that can achieve One Engine Inoperative (OEI) In Ground Effect (IGE) hover at an appropriate power rating at the offshore alternate. Where the surface of the offshore alternate helideck, or prevailing conditions (especially wind velocity), precludes an OEI IGE hover, OEI out of ground effect (OGE) hover performance at an appropriate power rating should be used to compute the landing mass. The landing mass shall be calculated based on the helicopter configuration, environmental conditions and the operation of systems which have an adverse effect on performance. The planned landing mass of the helicopter, including crew, passengers, baggage, cargo plus 30 minutes of Final Reserve fuel, shall not exceed the OEI (whether IGE or OGE as appropriate) landing mass at the time of the approach to the offshore alternate.

5.5.4 An operator shall not select a helideck as a destination or offshore alternate unless the aerodrome forecast indicates that during a period commencing one hour before and ending one hour after the expected time of arrival at the destination and offshore alternate, the weather conditions will be at or above the following planning minima: cloud base 600 ft. day/ 800 ft. night and visibility 4km day/5km night. Where fog is forecasted, or has been observed within the last two hours within 60nm of the destination or alternate, offshore alternates should not be used.

5.6 Point of No Return

5.6.1 The operator shall ensure that before passing the PNR - which should not be more than 30 minutes from the destination - the following actions should have been completed:

(a) Confirmation that navigation to the destination and offshore alternate can be assured;

(b) Radio contact with the destination and offshore alternate can be assured;

(c) The landing forecast at the destination and offshore alternate has been obtained and confirmed to be above the required minima;

(d) The requirements for landing with one engine inoperative has been checked to ensure that they can be met; and

(e) The availability of the offshore alternate should be guaranteed by the duty holder (the rig operator in the case of fixed installations and the owner in the case of mobiles) to the extent possible, having regard to information on current and forecast use of the offshore alternate and on conditions prevailing, until landing at the destination, or the offshore alternate, has been achieved (or until offshore shuttling has been completed).

6 HELICOPTER LOAD OPERATIONS

6.1 Loading Instructions

6.1.1 An operator shall ensure that loading instructions are included in the operations manual. The loading instructions shall consider the capabilities, limitations and operation of the helicopter(s) intended. The instructions shall be prepared and written in a clear, simple and concise manner for users with little or no aviation experience, such as oil rig crews and contractors' staff, to understand.

6.2 Under Slung Load Operations

6.2.1 Operators shall ensure that a two-way communications system is established between the flight crew and the ground crew performing under slung load operations and shall include in the operations manual the procedures for the use of such two-way communications system.

6.2.2 All crew members performing under slung load operations shall wear protective helmets.

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7 TURNING OF HELICOPTER ROTOR UNDER POWER

7.1 A helicopter rotor shall not be turned under power without a qualified pilot at the controls.

8 LOSS OF TAIL ROTOR EFFECTIVENESS

8.1 An operator shall include in its operations manual procedures to avoid and to recover from loss of tail rotor effectiveness.

9 RADIO ALTIMETER (HEIGHT BUG SETTING PROCEDURES)

9.1 Helicopters conducting over water operations should be equipped with one radio altimeter and audio voice (if any) alerting devices.

9.2 The operator shall include in its operations manual the procedures for setting the height bug or equivalent decision height indicator. The height indicator shall be set at an appropriate level such as to give pilots “adequate” warning/reaction time.

10 PERFORMANCES

10.1 Applicability

10.1.1 Helicopters with a passenger seating configuration of more than 19, or helicopters operating to or from a heliport in a congested hostile environment shall be operating in performance Class 1.

10.1.2 Helicopters with a passenger seating configuration of 19 or less but more than 9 should be operating in performance Class 1 or 2, unless operating to or from a congested hostile environment in which case the helicopters shall be operating in performance Class 1.

10.1.3 Helicopters with a passenger seating configuration of 9 or less should be operating in performance Class 1, 2 or 3, unless operating to or from a congested hostile environment in which case the helicopters shall be operating in performance Class 1.

10.2 General

10.2.1 The operator shall not permit a flight to be commenced unless the performance information provided in the flight manual, supplemented as necessary with other data acceptable to the Authority indicates that the requirements of Paragraph 10 can be complied with for the flight to be undertaken.

10.2.2 In determining the requirements of the performance, the operator shall consider the following parameters:

(a) Mass of the helicopter;

(i) Mass of the helicopter at the start of the take-off or in the case of in-flight re-planning the point from which the revised operational flight plan applies, is not greater than the mass at which the requirement of the Performance Class can be complied with.

(b) Helicopter configuration;

(c) Environmental conditions in particular:

(i) Pressure-altitude, and temperature; and

(ii) Wind;

(1) For take-off, take-off flight path and landing requirements, accountability for wind shall be no more than 50 % of any reported steady head wind component of 5 knots or more;

(2) Where take-off and landing with a tail wind component is permitted in the Helicopter Flight Manual, and in all cases for the take-off flight path, not less than 150% of any reported tail wind component shall be taken into account; and

(3) Where precise wind measuring equipment enables accurate measurement of wind velocity over the point of take-off and landing, alternate wind components specific to a site may be approved by the Authority.

(d) The Heli-deck slope, and the surface conditions of the Heli-deck;

(e) Operating procedures; and

(f) Operation of any system which have adverse effect on performance.

10.3 Operating Conditions

10.3.1 For helicopters operating in performance Class 2 or 3 in any flight phase where a power unit may cause the helicopter to force land, the operator shall:

(a) Define a minimum visibility that is not less than 800 m for helicopters operating in performance Class 2 and 3, taking into account the characteristics of the helicopter;

(b) Verify that the surface below the intended flight path permits the pilot to execute a safe forced landing;

(c) Conduct operations in performance Class 2 only if the helicopter involved has a safe forced landing capability during take-off and landing; and

(d) Conduct operations in performance Class 3 only in a non-hostile environment.

10.3.2 Operations in performance Class 3 shall not be performed out of sight of the surface or when the cloud ceiling is less than 180 m (600 ft).

***Note*:-** *Operations in performance Class 3 in IMC or at night shall not be permitted in Thailand.*

10.4 Obstacle Accountability

10.4.1 For the purpose of obstacle clearance requirements, an obstacle located beyond the FATO, in the take-off path or the missed approach flight path, shall be considered if its lateral distance from the nearest point on the surface below the intended flight path is not further than:

(a) For VFR operations:

(i) half of the minimum width of the FATO (or the equivalent term used in the helicopter flight manual) defined in the helicopter flight manual (or when no width is defined, 0.75 D), plus 0.25 times D (or 3 m, whichever is greater), plus:

(1) 0.10 DR for VFR day operations

(2) 0.15 DR for VFR night operations

(b) For IFR operations:

(i) 1.5D (or 30m, whichever is greater) plus:

(1) 0.10 DR for IFR operations with accurate course guidance

(2) 0.15 DR for IFR operations with standard course guidance

(3) 0.30 DR for IFR operations without course guidance

10.4.2 For operations with initial take-off conducted visually and converted to IFR/IMC at a transition point, the criteria required in Paragraph 10.4.1 a) shall apply up to the transition point then the criteria required in Paragraph 10.4.1 b) shall apply after the transition point.

***Note*:-** *The transition point cannot be located before the end of TODRH for helicopters operating in performance Class 1 and before the DPATO for helicopters operating in performance Class 2.*

10.4.3 When considering the missed approach flight path, the divergence of the obstacle accountability area shall only apply after the end of the take-off distance available.

***Note*:-** *Standard course guidance includes ADF and VOR guidance. Accurate course guidance includes ILS, MLS or other course guidance providing an equivalent navigational accuracy.*

10.4.4 For take-off using a backup (or a lateral transition) procedure; for the purpose of obstacle clearance requirements, an obstacle, located in the backup (or lateral transition) area, shall be considered if its lateral distance from the nearest point on the surface below the intended flight path is not further than:

(a) Half the minimum FATO (or the equivalent term used in the Flight Manual) width defined in the Helicopter Flight Manual (or, when no width is defined 0.75D) plus 0.25 times D (or 3m, whichever is greater) plus:

(i) For VFR day, 0.10 of the distance travelled from the back of the FATO; or

(ii) For VFR night, 0.15 of the distance travelled from the back of the FATO.

10.4.5 Obstacles may be disregarded if they are situated beyond:

(a) 7R for day operations if navigation accuracy can be achieved by reference to suitable visual cues during the climb.

(b) 10R for night operations if navigation accuracy can be achieved by reference to suitable visual cues during the climb.

(c) 300 m if navigational accuracy can be achieved by appropriate navigation aids; and

(d) 900 m in other cases.

10.5 Operating Area Consideration.

10.5.1 For operations in performance Class 1, the dimensions of the FATO should be at least equal to the dimensions specified in the Helicopter Flight Manual.

***Note*:-** *A FATO that is smaller than the dimensions specified in the helicopter flight manual may be accepted if the helicopter is capable of a hover out of ground effect with one engine inoperative and requirements stated in Paragraph 10.6 below are met.*

10.6 Operations in Performance Class 1.

10.6.1 Take-off and initial climb phase.

(a) The helicopter shall be able, in the event of the failure of the critical power-unit being recognised at or before TDP, to discontinue the take-off and stop within the rejected take-off area available or, in the event of the failure of the critical power-unit being recognised at or after TDP, to continue the take-off, clearing all obstacles along the flight path by an adequate margin until it is in a position to comply with Paragraph 10.6.3.

(b) The take-off mass of the helicopter shall not exceed the maximum take-off mass specified in the helicopter flight manual for the procedure to be used and to achieve a rate of climb of 100 ft. per minute at 60 m (200 ft.) and 150 ft. per minute at 300 m (1,000 ft.) above the level of the heliport with the critical engine inoperative and the remaining power-units operating at an appropriate power rating, taking into consideration the parameters specified in paragraph 10.2.2c) and figure 1.

(c) The take-off mass shall be such that the rejected take-off distance required does not exceed the rejected take-off distance available.

(d) The take-off mass shall be such that the take-off distance required does not exceed the take-off distance available.

***Note 1*:-** *As an alternative, the requirement above may be disregarded provided that the helicopter with the critical power-unit failure recognised at TDP can, when continuing the take-off, clear all obstacles from the end of the take-off distance available to the end of the take-off distance required by a vertical margin of not less than 10.7 m* (*35 ft.*) (*Figure 2*).

Note 2:- *For elevated heliports, clearance from the elevated heliport edge is shown in Figure 3.*

(e) An operator shall ensure that, with the critical power-unit inoperative, all obstacles below the backup flight path (the lateral flight path) are cleared by an adequate margin. Only the obstacles in Paragraph 10.4.4 shall be considered

10.6.2 Take-off flight path

(a) From the end of the take-off distance required with the critical power-unit inoperative:

(i) The take-off mass shall be such that the climb path provides a vertical clearance of not less than 10.7 m (35 ft) for VFR and 10.7 m (35 ft) plus 0.01 DR for IFR operations above all obstacles located in the climb path. Obstacles specified in Paragraph 10.4 shall be considered.

(b) When a change of direction of more than 15 degrees is made, obstacle clearance requirements shall be increased by 5m (15ft) from the point at which the turn is initiated. The turn shall not be initiated before reaching a height of 60m (200ft) above the take-off surface, unless permitted as part of an approved procedure in the operations manual.

10.6.3 En-route

(a) The take-off mass is such that it is possible, in case of the critical power-unit failure occurring at any point of the flight path, to continue the flight to an appropriate landing site at which the conditions of Paragraph 10.6.4 can be met without flying below the appropriate minimum flight altitudes for the route to be flown.

10.6.4 Approach, landing and balked landing (Figure 4 and 5).

(a) In the event of the failure of the critical power-unit being recognised at any point during the approach and landing phase, before LDP, the helicopter shall, at the destination and at any alternate, after clearing all obstacles in the flight path, be able to land and stop within the landing distance available or to perform a balked landing and clear all obstacles in the flight path by an adequate margin. In case of the failure occurring after the LDP, the helicopter shall be able to land and stop within the landing distance available. The estimated landing mass at the destination or alternate should be such that:

(i) It does not exceed the maximum landing mass specified in the Flight Manual for the procedure to be used and to achieve a rate of climb of 100 ft. per min at 60m (200 ft.) and 150 ft. per min at 300 m (1,000 ft.) above the level of the heliport with the critical engine power-unit inoperative and the remaining power-units operating at an appropriate power rating, taking into account the parameters specified in Paragraph 10.2.2;

(ii) The landing distance required does not exceed the landing distance available unless the helicopter, with the critical power unit failure recognised at LDP can, when landing, clear all obstacles in the approach path;

(iii) In the case of the critical power-unit failure occurring at any point after LDP, it is possible to land and stop within the FATO; and

(iv) In the event of the critical power-unit failure being recognised at the LDP or at any point before the LDP, it is possible to land and stop within the FATO or to overshoot, meeting the conditions of Paragraph 10.6.2.

***Note*:-** *For elevated heliports clearance from the heliport edge is shown in Figure 5.*

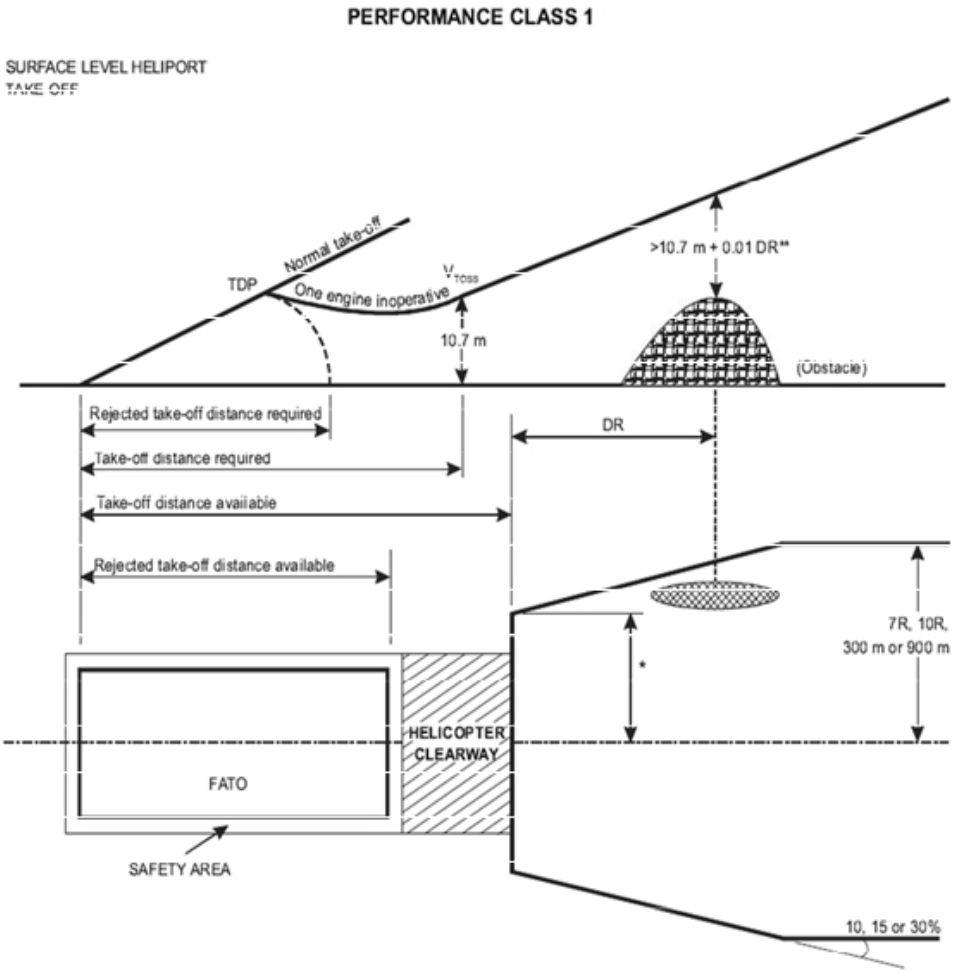

Figure 1

* Half of minimum FATO width defined in the HFM (or when no width defined 0.75D) + 0.25 D (or 3 m, whichever is greater) for VFR operations. 1.5 D (or 30 m, whichever is greater) for IFR operations

** 10.7 m for VFR operations. 10.7 m + 0.01 DR for IFR operations

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PERFORMANCE CLASS 1

SURFACE LEVEL HELIPORT

(Alternative presented in Note 1 to 10.6.1c)

TAKE-OFF

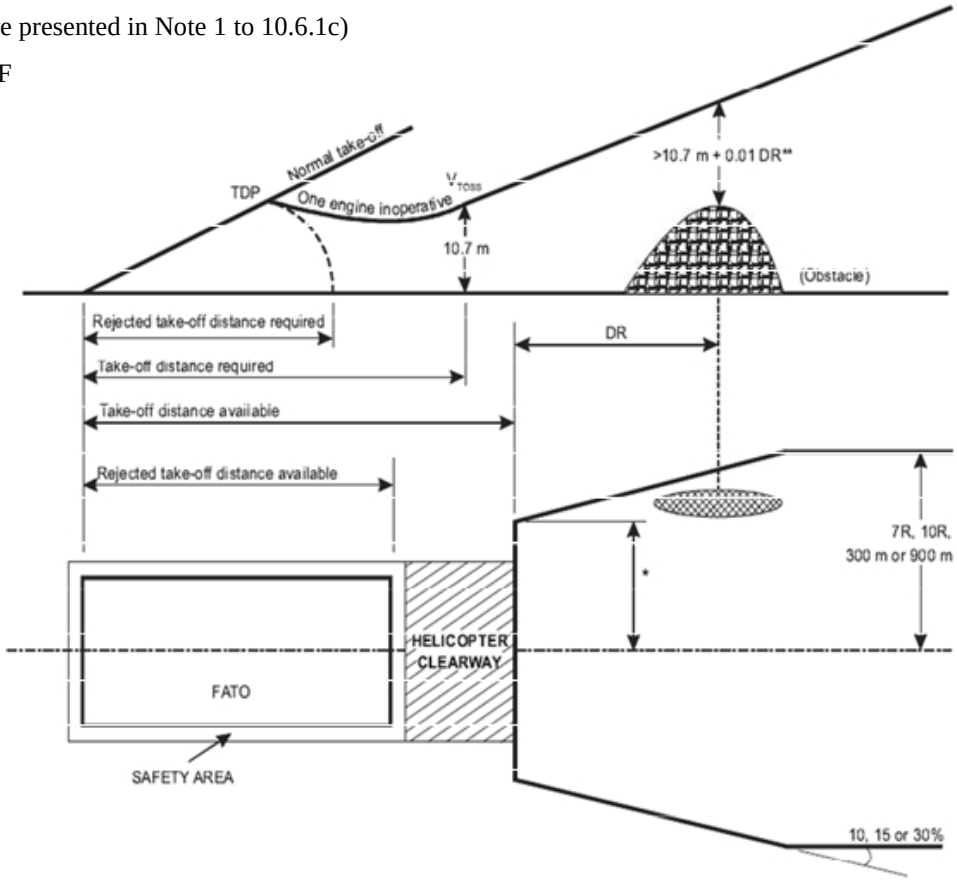

Figure 2

* Half of minimum FATO width defined in the HFM (or when no width defined 0.75D) + 0.25 D (or 3 m, whichever is greater) for VFR operations. 1.5 D (or 30 m, whichever is greater) for IFR operations

** 10.7 m for VFR operations. 10.7 m + 0.01 DR for IFR operations

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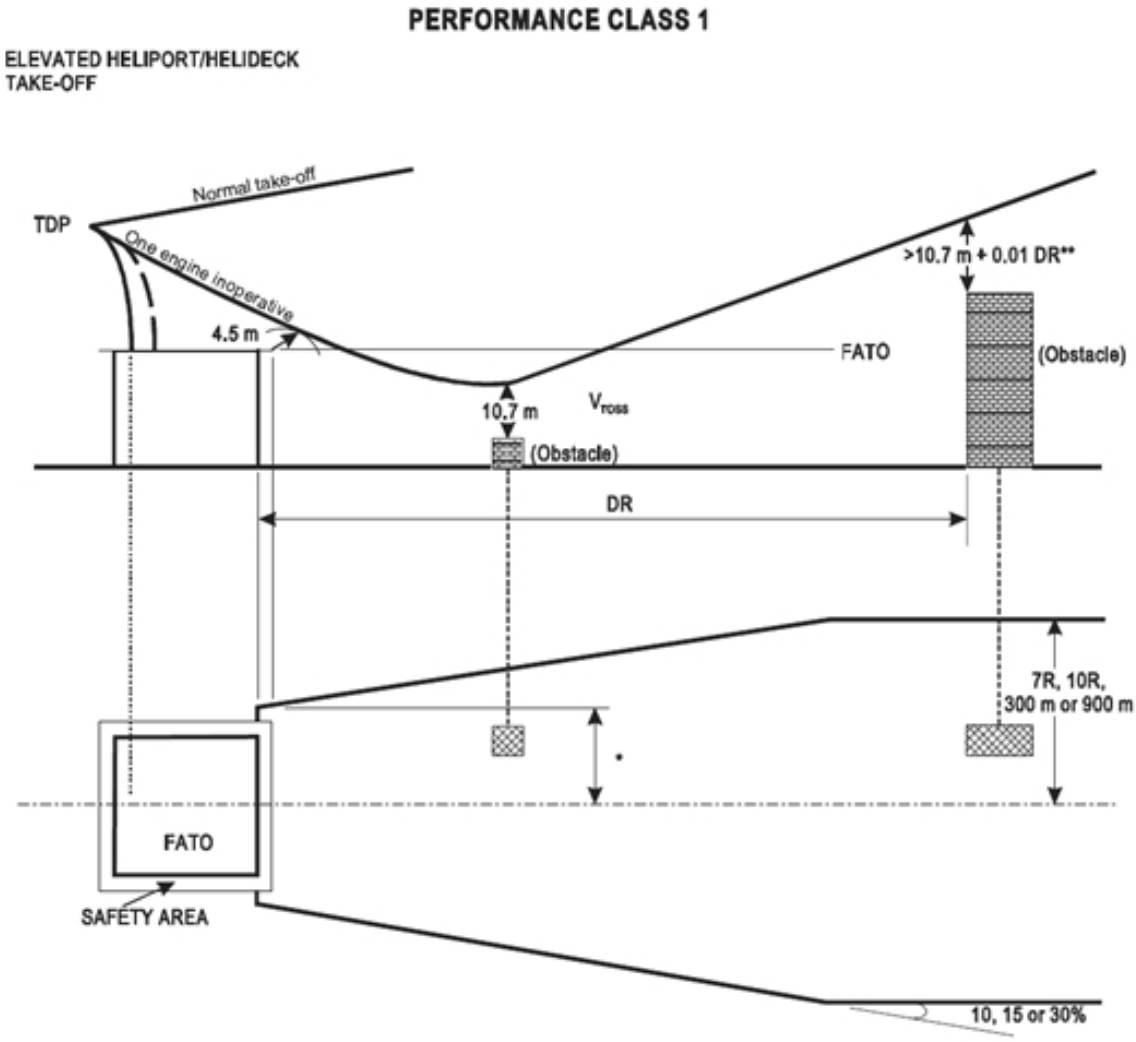

Figure 3

* Half of the minimum FATO width defined in the HFM (or when no width defined, 0.75 D) + 0.25 D (or 3 m, whichever is greater) for VFR Operations. 1.5 D (or 30 m, whichever is greater) for IFR operations.

** 10.7 m + 0.01 DR for IFR operations

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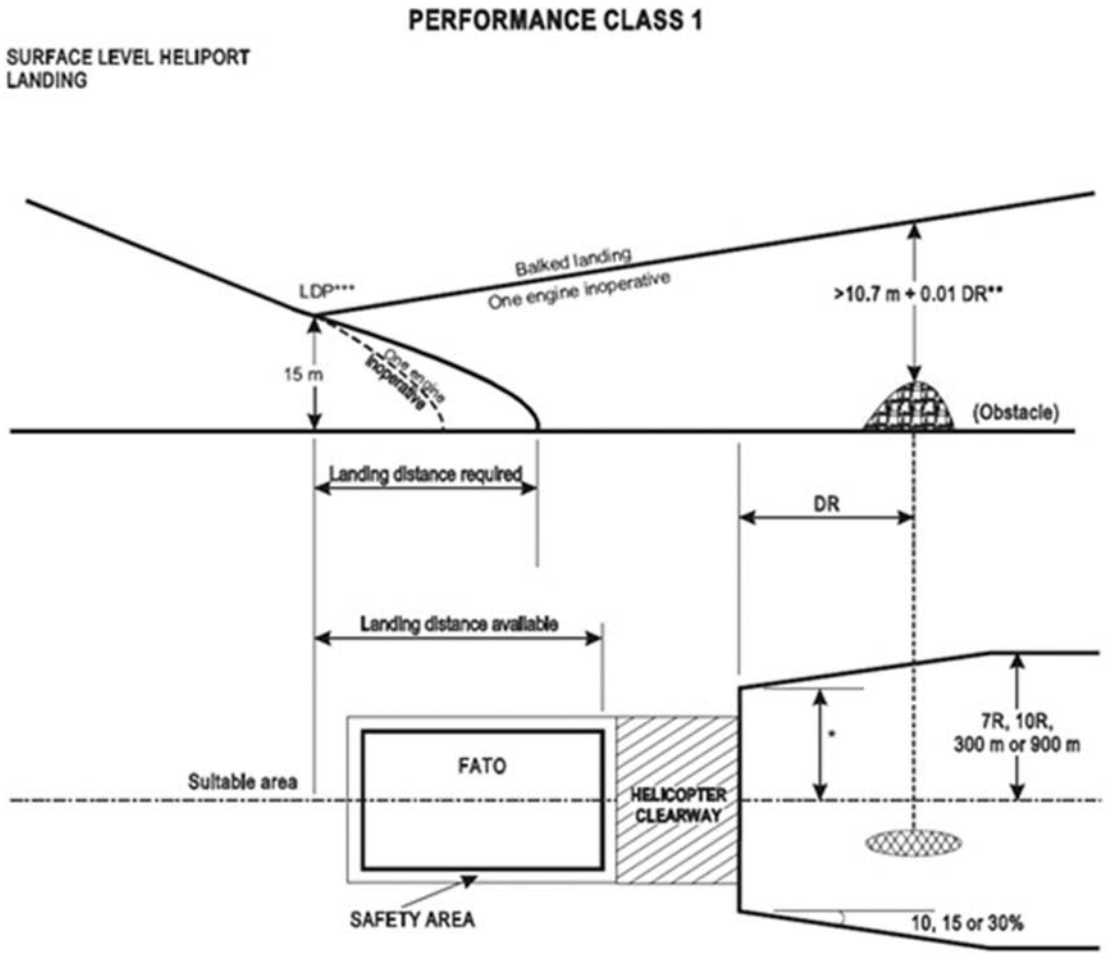

Figure 4

* Half of the minimum FATO as defined in the HFM (or when no width defined, 0.75 D) + 0.25 D (or 3 m, whichever is greater) for VFR operations.1.5 D (or 30 m, whichever is greater) for IFR operations

** 10.7 m for VFR operations. 10.7 m + 0.01 DR for IFR operations

For the purposes of the diagram, all paths and distances emanate from 50 ft (15 m). The actual height of this point and position of the LDP should be obtained from the HFM

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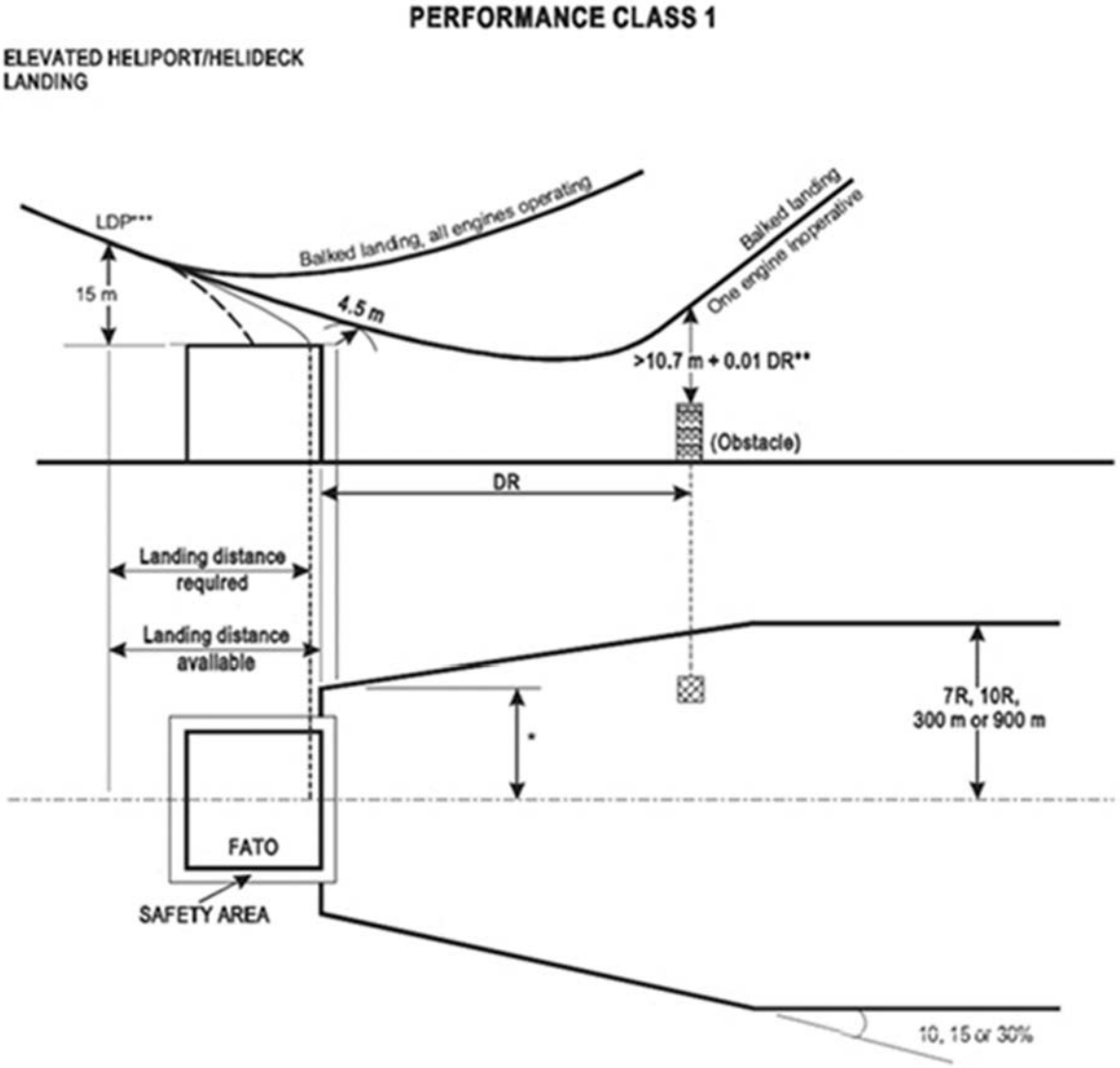

Figure 5

* Half of minimum FATO width defined in the HFM (or when no width defined, 0.75 D) + 0.25 D (or 3 m, whichever is greater) for VFR operations. 1.5 D (or 30 m, whichever is greater) for IFR operations

** 10.7 m for VFR operations. 10.7 m + 0.01 DR for IFR operations

For the purpose of the diagram, all paths and distances emanate from 50 ft (15 m). The actual height of this point and position of the LDP should be obtained from the HFM

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10.7 Operations in Performance Class 2

10.7.1 Take-off and initial climb phase (Figure 6 and 7)

(a) The helicopter shall be able, in the event of the failure of the critical power-unit at any time after reaching DPATO, to continue the take-off, clearing all the obstacles along the flight path by an adequate margin until the helicopter is in a position to comply with the requirements in Paragraph 10.7.3. Before the DPATO, failure of the critical power-unit may cause the helicopter to force-land. Therefore, the condition that appropriate consideration be given to achieve a safe forced landing applies.

(b) The mass of the helicopter at take-off should not exceed the maximum take-off mass specified in the flight manual for the procedures to be used and to achieve a rate of climb of 150 ft. per minute at 300 m (1,000 ft.) above the level of the heliport with the critical power-unit inoperative and the remaining power-units operating at an appropriate power rating, taking into account the parameters specified in Paragraph 10.2.2.

10.7.2 Take-off flight path

(a) From DPATO or, as an alternative, no later than 60 m (200 ft.) above the take-off surface with the critical power-unit inoperative, the conditions of Paragraph 10.6.2 shall be met.

10.7.3 En route

(a) The requirements of Paragraph 10.6.3 shall be met.

10.7.4 Approach, landing and balked landing (Figure 8 and 9).

(a) In the event of the failure of the critical power-unit before the DPBL, the helicopter shall, at the destination or any alternate, after clearing all obstacles, in the approach path, be either able to land and stop within the landing distance available or to perform a balked landing and clear all obstacles in the approach path by an adequate margin. After the DPBL, failure of the power-unit may cause the helicopter to force-land. Therefore, the condition that appropriate consideration be given to achieve a safe forced landing applies. The estimated landing mass at the destination or alternate should be such that:

(i) It does not exceed the maximum landing mass specified in the flight manual for a rate of climb of 150ft per min at 300m (1,000 ft.) above the level of the heliport with the critical power-unit inoperative and the remaining power-units operating at an appropriate power rating, taking into account the parameters specified in Paragraph 10.2.2; and

(ii) It is possible, in case of a power-unit failure occurring at or before the DPBL, either to perform a safe forced landing or to overshoot, meeting the

requirements of Paragraph 10.6.2.

10.7.5 Operations in Performance Class 2 shall take into account the obstacle accountability requirements specified in Paragraph 10.4.

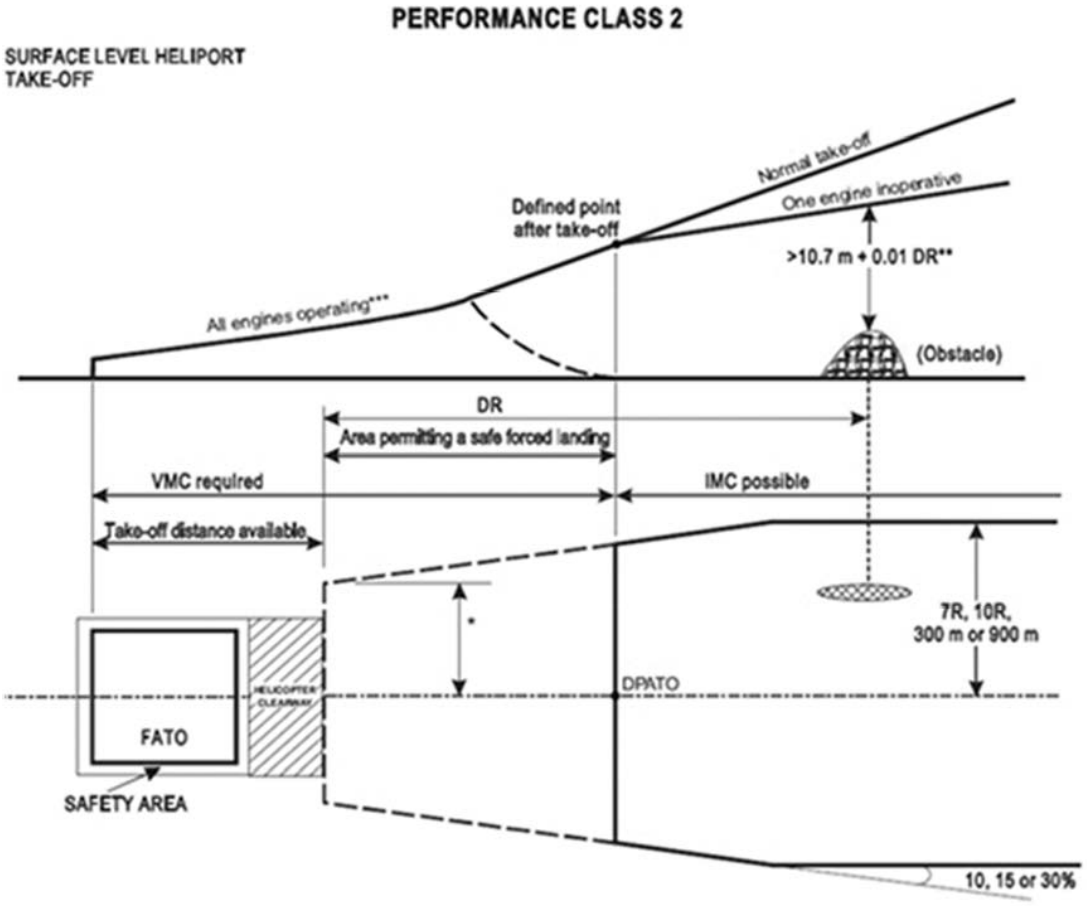

Figure 6

* 0.75 D +0.25 D (or 3 m, whichever is greater) for VFR operations. 1.5 D (or 30 m, whichever is greater) for IFR operations

** 10.7 m for VFR operations. 10.7 m + 0.01 DR for IFR operations.

*** Only the all engines-operating flight path is shown

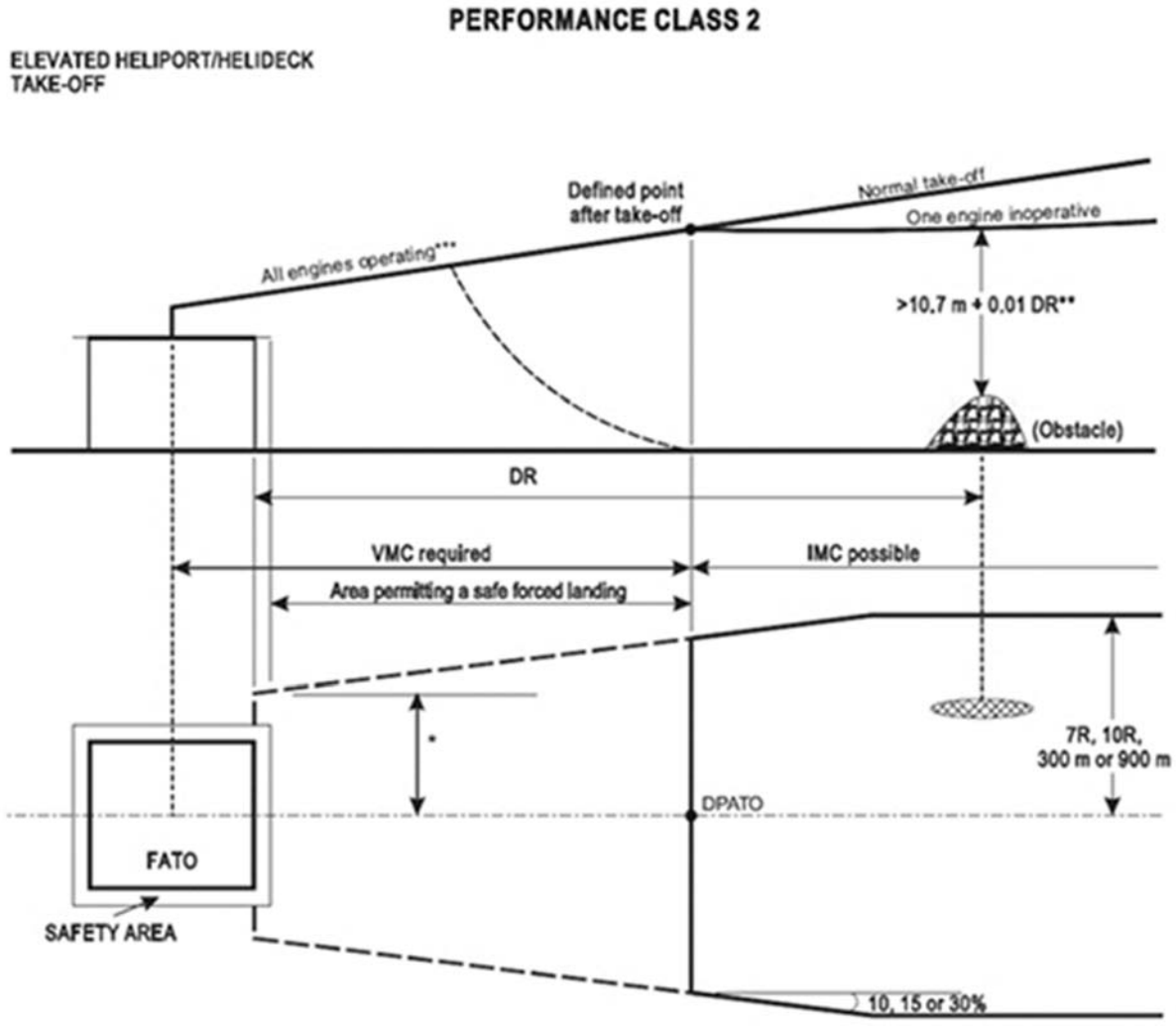

Figure 7

* 0.75 D +0.25 D (or 3 m, whichever is greater) for VFR operations. 1.5 D (or 30 m, whichever is greater) for IFR operations.

** 10.7 m for VFR operations. 10.7 m + 0.01 DR for IFR operations.

Only the all engines-operating flight path is shown.

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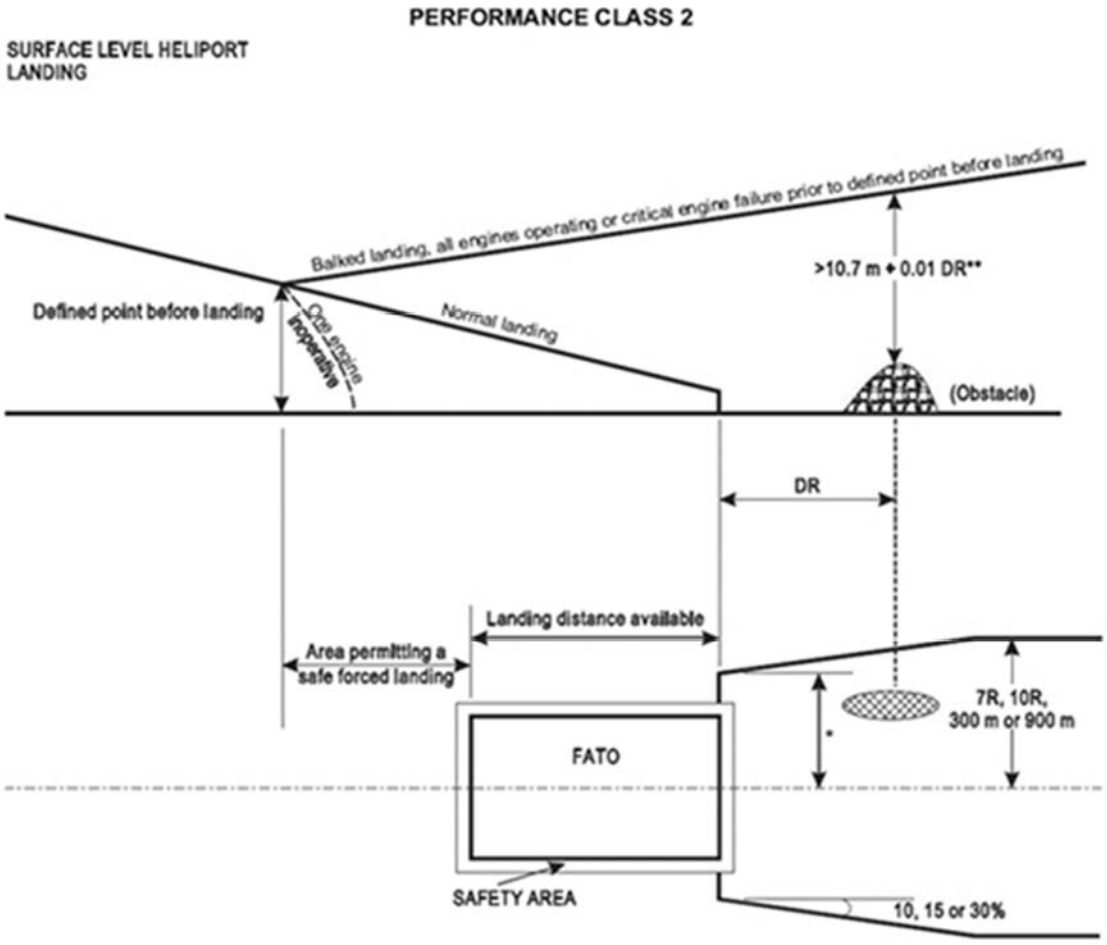

Figure 8

* 0.75 D +0.25 D (or 3 m, whichever is greater) for VFR operations. 1.5 D (or 30 m, whichever is greater) for IFR operations.

** 10.7 m for VFR operations. 10.7 m + 0.01 DR for IFR operations

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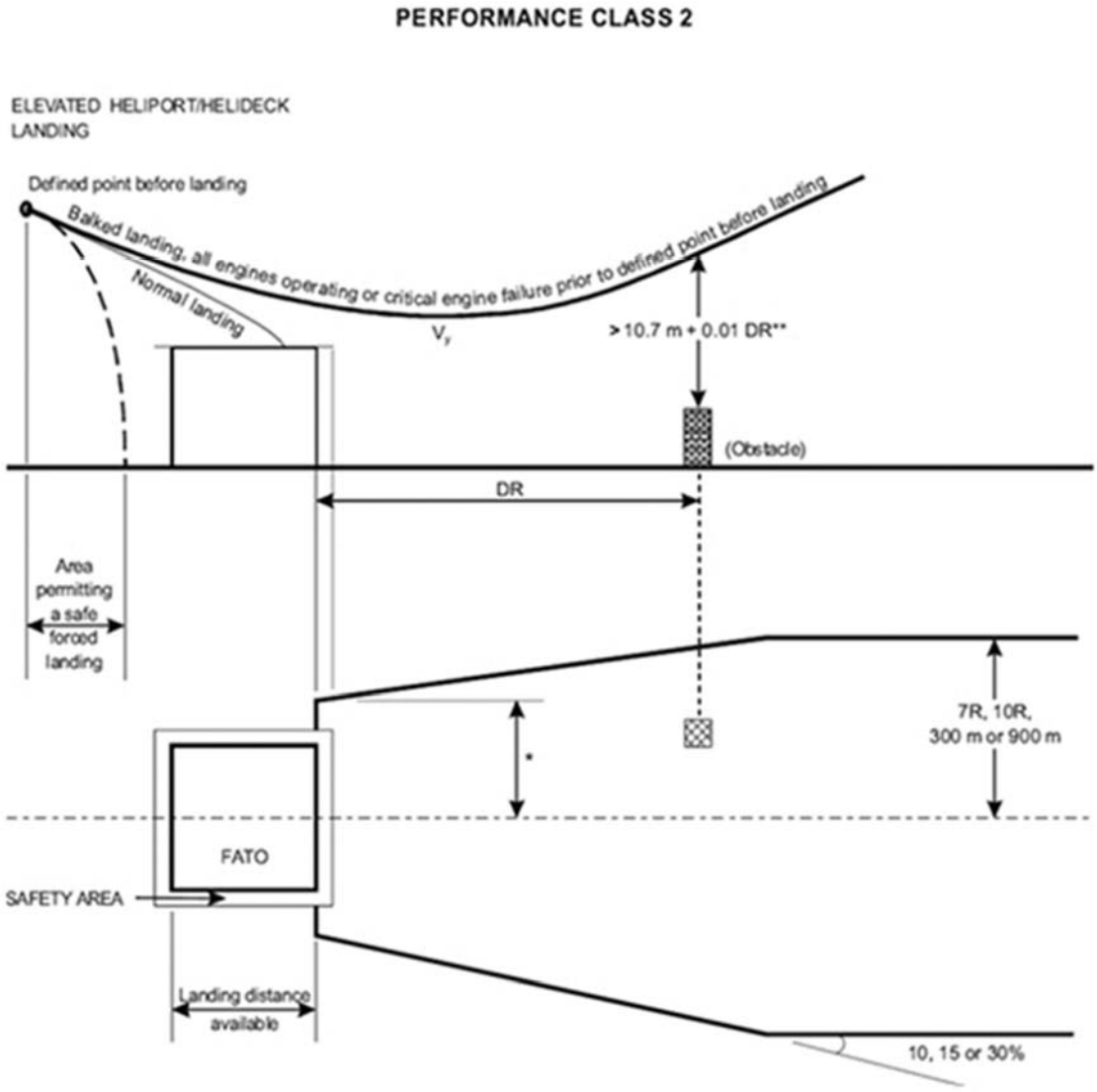

Figure 9

* 0.75 D +0.25 D (or 3 m, whichever is greater) for VFR operations. 1.5 D (or 30 m, whichever is greater) for IFR operations.

** 10.7 m for VFR operations. 10.7 m + 0.01 DR for IFR operations.

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10.8 Operations in performance Class 3

10.8.1 Take-off

(a) The mass of the helicopter at take-off shall not exceed the maximum take-off mass specified in the flight manual for a hover in ground effect with all power-units operating at take-off power, taking into account parameters specified in Paragraph 10.2.2. If the conditions are such that a hover in ground effect is not likely to be established, the take-off mass should not exceed the maximum mass specified for a hover out of ground effect with all power-units operating at take-off power, taking into account the parameters specified in Paragraph 10.2.2.

10.8.2 Initial climb

(a) The take-off mass shall be such that the climb path provides adequate vertical clearance above all obstacles located along the climb path, all engines operating.

10.8.3 En-route

(a) The take-off mass is such that it is possible to achieve the minimum flight altitudes for the route to be flown, all engines operating. At any point of the flight path, failure of a power-unit will cause the helicopter to force-land. Therefore, the condition that appropriate consideration be given to achieve a safe forced landing applies.

10.8.4 Approach and landing

(a) At any point of the flight path, failure of a power-unit will cause the helicopter to force-land. Therefore, the condition that appropriate consideration be given to achieve a safe forced landing applies. The estimated landing mass at the destination or alternate should be such that:

(i) It does not exceed the landing mass specified in the flight manual for a hover in ground effect with all power-units operating at take-off power, taking into account the parameters specified in 5.5.3. If conditions are such that a hover in ground is not likely to be established, the take-off mass should not exceed the maximum mass specified in a hover out of ground effect with all power-units operating at take-off power, taking into account the parameters specified in paragraph 10.2.2; and

(ii) It is possible to perform a balked landing, all engines operating, at the point of the flight path and clear all obstacles by an adequate vertical interval.

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11 FLIGHTS IN VMC AT NIGHT

11.1 General

11.1.1 VFR flight shall not be conducted between sunset and sunrise unless authorized by the Authority and appropriate air traffic services unit.

11.1.2 A helicopter flying at night shall be flown in accordance with the IFR unless it is within control zone on a Special VFR flight.

11.2 Flight Crew Qualification

11.2.1 An operator shall ensure that a pilot does not fly as Pilot-in-Command at night in VMC unless the pilot has:

(a) A minimum of 300 hours total flight time on helicopters which includes 100 hours as pilot-in-command and 10 hours at night as pilot flying; and

(b) Has carried out in the preceding 90 days at least 3 take-off, approach and landing at night as a pilot flying in an aircraft of the same type or class or an flight simulator representing that type or class.

11.3 Weather Minima

11.3.1 An operator shall specify in its operations manual the weather minima for VMC night flights. Minima shall be specified for the following cases:

(a) Where the helicopter and/or flight crew is not equipped for and capable of intentionally flying under IMC conditions; and

(b) Where the helicopter and/or flight crew is equipped for and capable of flying under IMC conditions and subsequently making either an instrument approach to an airfield or regaining VMC.

11.3.2 For the purpose of Paragraph 11.3.1 a), a helicopter and/or flight crew is considered capable of flying under IMC conditions if the following conditions are met:

(a) The crew must be qualified for flying under IFR conditions i.e holding an instrument rating and with appropriate training and checking;

(b) The operator has specified procedures for flights under IFR conditions;

(c) The helicopter is equipped for IFR flight; and

(d) The weather conditions and fuel state met the minimum requirements stated in this Manual for the intended IFR flight and any required diversion.

11.3.3 For night flight in VMC with visual ground reference, the aircraft altitude must be capable of being assessed by reference to a clearly distinguishable external horizon that may be provided either by natural lighting or artificial lights spread deeply and widely across the track.

11.4 Night Weather Limits

11.4.1 For a non-IMC capable crew/helicopter combination flying in VMC at night by visual ground reference, the visibility shall not be less than 5 km and the forecast cloud base for the route shall not be less than 1,500 ft. above the highest terrain within 5 NM of the route. If the weather deteriorates en- route below the specified minima, the helicopter shall divert, return to the place of departure.

11.4.2 For an IMC capable crew/helicopter combination flying in VMC at night by visual ground reference, the visibility shall not be less than 5 km and the forecast cloud base for the route shall not be less than 1,200 ft. above the highest terrain within 5 NM of the route. If the weather deteriorates en-route below the specified minima, the helicopter shall divert, return to the place of departure or continue the flight in IMC.

11.4.3 An operator may operate under relaxed weather limits in very specific areas of operation such as flights that are wholly within the confines of a well illuminated urban area or a well illuminated line feature or within local areas associated with the company operating base, subject to the approval of the Authority. Operators shall demonstrate an equivalent level of safety case for consideration by the Authority and include the relevant instructions in the operations manual.

12 TRAINING AND CHECKING

12.1 General

12.1.1 The training and checking for helicopter pilots shall be based, as far as it is practicable to do so, on those for Aeroplane pilots set out in Chapter 4 of this document.

12.1.2 The periods of validity of the various tests are as follows:

(a) Type rating Certificate of Test, Bi-Annual Proficiency Checks shall be performed twice within any period of one year from the skill test with simulator or aircraft. Any two such checks which are similar and which occur within a period of four consecutive months shall not alone satisfy this requirement.

(b) The instrument ratings test, line checks and emergency/survival checks as detailed in Chapter 6 of this document are valid for 12 months.

12.1.3 Pilot-in-Command and co-pilots shall be checked in their respective seats unless in the case of Pilot-in-Command whose duties also require them to carry out duties of the co-pilot seat, or in the case of Pilot-in-Command who are required to conduct training or examining duties, in which case they shall complete their proficiency checks respectively from right to left hand seats, on alternate proficiency checks.

12.2 Line Checks

12.2.1 The Operator shall ensure that the content of the line check reflects the wide variety of roles in which pilots may be engaged in. In any event the duration of the annual line check should not be less than 40 minutes for offshore operations and 20 minutes for onshore operations.

12.2.2 Conduct of the line check shall closely follow the requirements of Paragraph 3.1 of Chapter 4 of the AOCR. For pilots who are required to operate at night or under IMC, the check must include an appropriate sector and certification. The airways section of the instrument rating renewal may be counted as satisfying the IMC requirement.

12.3 Proficiency Checks

12.3.1 Proficiency Checks may embrace a VMC part and an IMC part. It is acceptable to treat the VMC and IMC parts as separate checks, each with the period of validity stated in paragraph 12.1.2 (a). It may be preferable to conduct the VMC part alternately by day and night, so that those items which are appropriate to night operation and those which should only be attempted in daylight are checked at least annually. Operators shall ensure that pilots comply with the requirement in respect of night flying recency.

12.3.2 The content of a VMC competency check shall include the following items where applicable to the type of helicopter:

(a) Engine failure before and after the decision point for each take off profile and each landing profile that is in use by the operator and is published in the Operations Manual;

(b) Flight and engine control systems malfunctions for which accepted procedures are included in the Helicopter Flight Manual; and

(c) Autorotation to a designated area with powered recovery to forward or hovering flight.

12.3.3 The content of the IMC competency check shall include the following items where applicable to the type of helicopter:

(a) Precision instrument approach to minima with, in the case of multi-engine helicopters, a simulated failure of one engine;

(b) Non-precision approach to minima;

(c) Where appropriate to the helicopter type, approach with flight control system/flight director system malfunction, flight instrument and navigation equipment failures;

(d) At least one instrument approach should be flown with a degradation of the flight control system/auto-pilot;

(e) Recovery from unusual attitudes and techniques for auto-rotation in IMC; and

(f) Correct crew procedures in IMC descent en-route, where applicable.

12.3.4 Competency checks for handling emergencies such as tail rotor failure, double engine failure, icing problems, or situations which would be impossible or only possible with an unacceptable risk to practice in flight shall be covered in a simulator or by verbal evaluation on the ground.

12.4 Instrument Approach Proficiency

12.4.1 At least one instrument approach shall be flown in IMC conditions (either actual or simulated) proficiency to satisfy the requirements for a pilot's instrument approach proficiency. The approach shall be carried to a position from which a successful landing could have been made and this may form part of the proficiency check.

12.5 Instrument Rating (Helicopters)

12.5.1 The helicopter instrument rating is valid only in respect of the helicopter type on which the test was conducted with the exception of the airways section which need only be conducted on one type in the case of a multi-type rated pilot.

12.6 Proficiency Checks -Night Flying in VMC Conditions

12.6.1 The initial Proficiency Check shall be conducted at night. Thereafter, each alternate Proficiency Check shall be conducted at night. A Proficiency Check conducted at night shall qualify a pilot for both day and night operations.

12.7 Low Visibility Take-Off and Category II and III Operations

12.7.1 An operator shall establish a training syllabus and programme for flight crew members conducting low visibility take-off, Category II and III operations. The training syllabus shall satisfy the requirements contained in Appendix U and shall be approved by the Authority. The training syllabus shall be included in the Operations Manual.

12.7.2 An operator shall not assign flight crew members to conduct low visibility take-off, Category II and III operations unless they have successfully completed the training and checking requirements prescribed in the training syllabus and programme.

12.7.3 The flight crew qualification shall be specific to the type of operation and the helicopter.

12.8 Conduct of Specialist Task Checks

12.8.1 An operator shall establish procedures in the operations manual to conduct role checks for specialists engaged to conduct specialised tasks, including:

(a) Maneuvers in confined areas or over rough or uneven ground;

(b) Over water operations, including winching;

(c) Under slung loads; and

(d) Power line "stringing".

12.9 Operations to Oil and Gas Installations and Vessels at Night

12.9.1 Operators conducting operations in offshore sites shall ensure that pilots undertaking the operations are initially qualified in night deck landings and thereafter, remain recent.

12.9.2 An initial night deck landing qualification will qualify a pilot to land on and depart from an installation at night. The qualification shall be valid for 12 months and may be revalidated by operating to a deck at night within the 12-month period. A pilot whose night deck recency has expired may operate to a deck at night provided he does not act as the Pilot-in-Command, is in-date for day deck landings and is accompanied by an experienced supervisory Pilot-in-Command.

13 RECENT EXPERIENCE

13.1 A pilot shall not operate a helicopter in commercial air transport or carrying passengers:

(a) As Pilot-in-Command or co-pilot unless he/she has carried out, in the preceding 90 days, at least 3 take- offs, approaches and landings in an aircraft of the same type or class or a flight simulator representing that type or class. The 3 take-offs and landings shall be performed in either multi-pilot or single-pilot operations, depending on the privileges held by the pilot; and

(b) As Pilot-in-Command at night unless he/ she has carried out in the preceding 90 days at least 3 take-off, approach and landing at night as a pilot flying in an aircraft of the same type or class or a flight simulator representing that type or class.

The requirements for the installation of an Electronic Flight Bags (EFBS) system refers to Chapter 10, Paragraph 25 of this document.

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CHAPTER 9

ARRANGEMENTS FOR ENGINEERING AND MAINTENANCE SUPPORT

Note:- *Maintenance Organization, also named Repair Station*

1 GENERAL

1.1 This Chapter prescribes the requirements for the operator's arrangements for engineering and maintenance support for aircraft covered by the AOC. The arrangements should commensurate with the number, type and complexity of the aircraft and the area and type of operations.

1.2 Under provision in 1.8 and 1.9 of Chapter 2, subsequent amendments of each approved manual for continuing airworthiness and maintenance activities such as general maintenance manual, maintenance programme, minimum equipment list, and other airworthiness manuals, may be approved indirectly through an indirect approval procedure approved by the Authority.

Note:-

(1) Other requirements may be specified for operators whose operations are of a limited nature and scope.

(2) Alternative arrangements may be permitted for some engineering functions to be undertaken by other organisations. This will depend on the organisation being approved for the purpose and being of an equivalent standard to that specified herein, and on the establishment of a system of management control by the operator to ensure that proper coordination and control exists over the planning and conduct of all work undertaken on his behalf and there is a maintenance release in relation to the maintenance carried out.

2 GENERAL MAINTENANCE MANUALS

2.1 The operator shall develop a General Maintenance Manual (GMM) to describe the procedures necessary to ensure all scheduled and unscheduled maintenance is performed on the operator's aircraft on time and in a controlled and satisfactory manner. The GMM shall also describe all engineering and maintenance arrangements to support the operator's operation. It shall provide all the necessary instructions, information and procedures for the personnel of the organisation to perform their duties. In addition, it shall contain directly, or by reference, the following information:

(a) A list of all associated procedures referred in the GMM in accordance with Appendix AF

(b) A list of all route stations, locations, or destinations with activity details undertaken at each location

(c) A list of contracted and subcontracted organisation and associated contracts or agreements

All associated documents referred in the GMM are considered a part of the GMM information.

Note 1:- Contracted Organisation *- A CAAT-approved organisation that carries out activities under its own approval for another approved organisation.*

Note 2:- Subcontracted Organisation *- An organisation, not itself appropriately approved to CAAT that carries out activities or a specialised service as a subcontractor for and under quality system of an organisation appropriately approved by the CAAT.*

Note 3:- *More details of the GMM content are given in Chapter 13 or, as applicable, Helicopter Operations Requirements (HOR) Chapter 9 and also in CAAT Announcement subject Requirement of General Maintenance Manual and CAAT Guidance Material for General Maintenance Manual.*

2.2 When maintenance is not carried out by an approved maintenance organization, in this case, the policies and procedures that govern and control the performance of maintenance shall be acceptable for the Authority. The operator's general maintenance manual shall describe the maintenance procedures including the procedures for completing and signing a maintenance release when maintenance is carried out a person or organization other than an approved maintenance organization. The general maintenance manual shall include the scope of maintenance to be performed under this provision.

2.3 From the provision 2.2, the general maintenance manual shall include details on its procedures and provision with regard to tooling, spares, facilities, technical record control, release to service, manpower resources, personnel competency and training. These criterions shall be in accordance with approved maintenance organization's requirements. The general maintenance manual shall be approved by the Authority prior to the commencement of any maintenance activity.

2.4 Paragraph 2.3 of this chapter are intended for maintenance activities up to line maintenance or equivalent. This does not permit replacement of major aircraft appliances (as defined in part 4 of Air Navigation Act B. E. 2497) including change of an engine, landing gear, propeller, and auxiliary power unit (APU). These tasks must be performed by an approved maintenance organization.

2.5 The line maintenance under 2.4 of this chapter shall not require the use of complex tools or equipment that requires extensive setting up, or specialised training.

2.6 Paragraph 7.3.1 of this chapter defines line maintenance as those maintenance activities required to prepare an aircraft for flight.

2.7 The operator may incorporate a procedure for the use of Minimum Equipment List (MEL)'s Rectification Interval Extension (RIE) in their General Maintenance Manual (GMM) in accordance with Appendix Z. The operator may be allowed to only grant a one-time extension of the applicable rectification provided the appropriate procedure established in the GMM is approved by the CAAT. In the case that more RIEs becomes necessary, approval from CAAT is required.

Note:- *More detail of the RIE procedure, is given in CAAT Guidance Material for Minimum Equipment List (MEL) Requirement.*

2.8 The permitted variation to maintenance periods as specified in CAAT announcement subject Aircraft Maintenance Programme of AOC Holder shall require approval granting from CAAT. However, the operator may incorporate a procedure for the use of such variation in their General Maintenance Manual (GMM) in accordance with Appendix AA. The operator may be allowed to use one-time of such variation provided the appropriate procedure established in the GMM is approved by the CAAT. Such variations shall be permitted only when the periods prescribed by the maintenance programme approved by CAAT (or documents in support of the maintenance programme) cannot be complied with due to circumstances, which could not reasonably have been foreseen by the operator. In the case of further extension of such variation, approval from CAAT is required.

2.9 The permitted variation to maintenance periods in 2.8 including condition and limitation shall be based on where the organization responsible for the type design has prescribed or as specified in CAAT Announcement subject Aircraft Maintenance Programme of AOC Holder, whichever is more restrictive.

2.10 The general maintenance manual and subsequent amendments shall be submitted to the Authority for approval.

2.11 Copies of all approved amendments to the general maintenance manual shall be furnished promptly to the Authority and all organisations or persons to whom the manual is issued.

2.12 Notwithstanding the provisions in 2.10, minor amendments to the GMM, or other airworthiness manuals as prescribed in 1.2, that have no impact on the approval held, may be approved indirectly through an indirect approval procedure. The indirect approval procedure shall define the minor amendment eligible, be established by the operator as part of the GMM and be approved by the Authority.

2.13 The operator shall specify the class of amendments which can be incorporated without the prior consent of the authority (‘indirect approval procedure’) and who is responsible for the amendment of the applicable in the GMM. Unless otherwise agreed by the Authority, the person responsible for the management of the quality system or for the organisational review should be responsible for monitoring and amending applicable manuals, including associated procedure’s manuals, and the submission of proposed amendments to the Authority.

2.14 Indirect approval procedure under provision 2.12 of this Chapter shall be in accordance with Appendix Y.

3 ENGINEERING AND MAINTENANCE SUPPORT

3.1 The operator is responsible that maintenance on his aircraft are performed in accordance with CAAT Requirements and that the aircraft are maintained in an airworthy condition. The operator shall also ensure that the Certificate of Airworthiness of each aircraft remains valid.

3.2 The operator shall satisfy the Authority that the engineering and maintenance support arrangements (i.e. the personnel, accommodation, equipment and facilities, organisations, procedures and documentation provided for the engineering and maintenance support of the aircraft covered by the AOC) are to a satisfactory standard.

3.3 The operator remains responsible for the safe operation of his aircraft when the accomplishment of maintenance is contracted out and must therefore be satisfied with the standards of airworthiness achieved by the maintenance contractor. The operator shall monitor the maintenance contractor's response to the provisions of the maintenance agreement, employing such technical resources as are necessary to achieve this task.

3.4 Maintenance support arrangements shall be based on an organisation approved by the Authority under CAAT Requirements for the maintenance or overhaul of the type of aircraft concerned.

3.5 For the purposes of the AOC, maintenance is taken to include the overall control of airworthiness and the accomplishment of scheduled and unscheduled servicing and inspection tasks.

3.6 The operator shall have management systems to ensure effective engineering support of his fleet of aircraft over the whole of the routes operated. quality control and assurance shall be exercised as necessary to achieve satisfactory standards of continuing airworthiness.

4 PERSONNEL

4.1 In additional to 7.2 of Chapter 1, The chief executive officer of the operator shall nominate the following persons for the Authority's acceptance:

(a) Heads of Engineering who shall be responsible for the management and supervision of continuing airworthiness activities of the organisations.

(b) Heads of Maintenance who shall be responsible for the management and supervision of maintenance activities of the organisations (If the air operator chooses to carry out maintenance on its aircraft under this provision the general maintenance manual).

(c) Certificate of Maintenance Review (CMR) Staff, an appropriate LAE licence or person who has knowledge at least at a level equivalent to General Familiarisation for the type of aircraft nominated to be signatories of relevant certification documents.

(d) Quality Manager for Maintenance which might be a same person as specified in 7.2 (d) of Chapter 1, who shall be responsible monitor compliance with AOCR for aircraft continuing airworthiness and maintenance, and the adequacy of procedures required to ensure airworthy aircraft. This person shall be independent from the work they monitor.

Note:- *Guidance material on the Acceptance of Nominated Persons can be found in CAAT Guidance Material Nominated Persons for AOC Engineering and AMO/MRO Organization (NOM) Requirement.*

4.2 These nominated persons shall be capable and responsible persons who are conversant with CAAT requirements and the relevant Annexes to the Convention on International Civil Aviation and have adequate qualifications and experience for the duties concerned. There shall be procedures to make clear who deputises for the nominated persons prescribed in 4.1(a), (b) and (d), in the case of lengthy absence of the said person (this may be done by detailing the procedures to appoint a deputy nominated person or by identifying directly the person by name).

4.3 The staff in all appropriate technical departments shall be of sufficient number, and shall have the training, competency and experience as may reasonably be expected to undertake the volume and type of work for which approval is sought.

4.4 The setup of the organisation shall be such as to ensure that in all matters affecting airworthiness, full and efficient co-ordination exists within departments, between related departments, and with external agencies.

4.5 All staff, including holders of Aircraft Maintenance Engineer licenses, who are required to issue Maintenance Review and Certificate of Release to Service shall be authorised by the person nominated to do so under the approval.

4.6 Persons under 4.1(c) authorized by the chief executive officer or the nominated person of this chapter shall be provided with copies of their approvals, preferably in card or booklet form, recording the following details:

(a) Name of organisation.

(b) Holder's name and signature.

(c) The Authority office approval reference number of the organisation and the holder's individual approval number.

(d) Details of the aircraft, engines, systems, equipment and maintenance tasks for which approvals have been granted, the scope of each approval and its date.

(e) A statement of any conditions of issue, including a statement to the effect that such approval is valid only so long as the holder is in organisation's employment.

4.7 Personnel records shall be kept, clearly indicating the basis upon which approvals have been granted. The records shall also include details of any Aircraft Maintenance Engineer licence held, training satisfactorily completed and the result of any written or oral assessment by the person responsible for granting the approval.

5 STAFF STRENGTHS

5.1 The operator shall ensure that there is a sufficient number of staffs, including qualified maintenance personnel to meet the demands of his operations. The operator shall ensure that support appropriate to his route pattern, transit frequency and maintenance requirements are provided at main bases and route stations. The operator shall be able to demonstrate that they have adequate manpower resources to support the entire scope of approval.

5.2 Shift duty periods shall be adequately staffed to effectively enable scheduled and unscheduled tasks to be performed. Adequate staff shall be made available to perform tasks of airworthiness significance in a proper manner. Company policies in respect of maintenance personnel duty periods shall be made known to the Authority.

5.3 The operator shall ensure that licensed and approved personnel are appropriately qualified to perform the tasks required, including the issue of Certificate of Maintenance Review and Certificates of Release to Service for Scheduled Maintenance Inspections and the rectification of defects.

5.4 If maintenance support is contracted out, the operator shall ensure that the maintenance contractor meets the requirements of 5 of this chapter.

6 STAFF STANDARDS AND TRAINING

6.1 General

6.1.1 The operator shall satisfy the Authority that its staff are adequately qualified. The operator shall provide adequate training facilities of its own or make contractual arrangements for such training using external sources to the satisfaction of the Authority.

6.1.2 Support appropriate to the route pattern transit frequency and maintenance requirements of the operator shall be provided at main bases, operational bases and route stations.

6.2 Scope of Training

6.2.1 Training shall be provided for those management, supervisory and quality personnel who are responsible for supervising the engineering support for the aircraft type(s) included in the AOC and for issuing the relevant Certificates of Release to Service and Certificate of Maintenance Review. Course syllabi shall include formal instruction and practical experience.

6.2.2 The number of supervisors, inspectors, quality engineers and mechanics to be trained before the introduction of a new type of aircraft into service shall take into account the complexity and numbers of the type, the anticipated pattern of aircraft utilisation and the organisation's previous experience of aircraft with similar characteristics.

6.2.3 An adequate number of mechanics shall receive aircraft and systems familiarisation training on the particular aircraft types and on related maintenance practices. Mechanics who hold Aircraft Maintenance Engineer licenses to be granted limited inspection approval shall be given specific training appropriate to that approval and to the satisfaction of the Quality Manager.

6.2.4 Provisions shall be made for continuation training in accordance with a programme acceptable to the Authority.

6.2.5 The operator shall ensure that a programme of training is available to ensure that:

(a) All maintenance personnel are adequately trained to perform the duties required of them.

(b) Personnel required to issue Certificate of Maintenance Review and Certificate of Release to Service receive familiarisation training on the aircraft type and instruction in the correct operation of the operator's airworthiness control procedures to enable them to perform these tasks on the type of aircraft for which support is being provided.

(c) Persons contracted to perform line maintenance tasks through maintenance agreements are trained in any significant differences which exists between the operator's aircraft and that which they are normally employed to maintain together with any relevant company procedures they are required to observe.

(d) Personnel engaged in maintenance-related tasks receive continuation training covering any changes to the aircraft and its maintenance, taking into account the result of in-service experience gained by the operator and that published by the aircraft, engine and equipment manufacturers. Attention shall also be paid to changes in company procedures, the Thailand Regulatory Requirement and requirements of the Authority.

(e) Personnel engaged in maintenance related tasks receive training in human factors.

6.2.6 Records shall be maintained of training undertaken by personnel including any results of assessments or examinations.

6.2.7 Training shall include formal instruction and practical experience depending up the nature of the training course.

6.2.8 Management, Quality Assurance and other relevant personnel should be trained in the techniques of maintenance management and the achievement of airworthiness appropriate to the posts held.

6.2.9 The operator shall ensure sufficient of the number of maintenance personnel, including management, supervisors, quality audit staff, and mechanics to be trained before the introduction into service of a new type of aircraft. Numbers should take into account the complexity of the aircraft and its systems, the fleet size, the anticipated pattern of aircraft utilisation and the organisation's previous experience of similar aircraft.

7 CONTRACTED OUT MAINTENANCE

7.1 General

7.1.1 The management and accomplishment of engineering and maintenance support may be achieved by the operator using his own or an associated maintenance organisation. Alternatively, all or part of the arrangements may be contracted to a separate organisation approved or accepted by the Authority.

7.1.2 Contracted arrangements for engineering and maintenance support do not absolve the operator from the overall responsibility for ensuring the safe operation and continuing airworthiness of the aircraft.

7.1.3 Where the operator does not maintain the aircraft, he operates using only his own resources, full detail of the division of responsibilities between the operator and the contracted maintenance organisation must be included in an agreement between the two parties. Matters to be addressed in such an agreement are contained at Appendix P. A commercial redacted copy of the maintenance agreement shall be available for Authority Which may require.

7.1.4 Where an operator contracts out part or all of the maintenance to a separate organisation, he shall nominate a person for engineering liaison purposes. This person will be responsible to the operator; for planning the timely presentation of the aircraft to the maintenance support organisation for all contracted maintenance; for liaison on all matters relating to the maintenance contract or agreement and for airworthiness matters affecting the safe operation of the aircraft.

7.1.5 The operator's representatives shall visit the contracted maintenance organisation at the inception of the agreement, and periodically thereafter, to ensure that the standards agreed are being maintained. Reports of all such visits shall be kept and made available to the Authority on request.

7.1.6 In order to be able to discharge his responsibilities for continued airworthiness, the Certificate of Maintenance Review (CMR) required for the operator to ensure on a continuing basis that the requirements of the approved maintenance schedule are being complied with, including condition monitoring and reliability reporting, and be made aware of any significant performance trends.

7.1.7 Responsibilities for the assessment and incorporation of manufacturer's Service Information and for compliance with mandatory requirements shall be clearly defined in the agreement.

7.1.8 In its assessment of the overall engineering support arrangements provided by the operator, the Authority may examine or request copies of all agreements, including side letters and addenda, between the parties concerned.

7.1.9 The Authority shall be notified at least one month in advance of any proposal to change the maintenance arrangements, e.g. a change to another maintenance organisation or significant organisational, procedural or technical change to a maintenance agreement.

7.2 Contracting out Full Support

7.2.1 The operator may contract full maintenance support to an organisation approved by the Authority in accordance with CAAT requirements for the maintenance or overhaul of the type(s) of aircraft concerned.

7.2.2 The operator shall ensure that the maintenance organisation competently discharges its responsibilities under the agreement, to his satisfaction, and is responsible for satisfying the Authority that the organisation meets the requirements of this Chapter insofar as they relate to the contracted work.

7.2.3 Written agreements shall be drawn up between the operator and the maintenance organisation to clearly define what responsibility for action is allowed to the maintenance organisation without prior consultation, and what tasks require agreement by the operator.

7.2.4 Whenever an aircraft is presented for scheduled or unscheduled maintenance it is essential that a precise indication is given of the inspections required, all defects known to exist on the aircraft plus any additional work required to be carried out (after consultation with the maintenance organisation as necessary).

Note:- *Operators must appreciate that a maintenance organisation cannot carry out work or certify inspections without their instructions or agreement and it follows that they should be specific when making known their work requirements to the organisation of their choice. Difficulties regularly occur because there is a misunderstanding between customer and maintenance organisation as to the former's requirements.*

7.2.5 The operator shall ensure that all tasks completed and certificated during line maintenance or by other organisations/engineers be made available to his maintenance contractor.

7.3 Contracting out Line Maintenance Support

7.3.1 Line maintenance is defined as those maintenance activities required to prepare an aircraft for flight including:

(a) Trouble shooting

(b) Defect rectification in accordance with Appendix W

(c) Component replacement with use of external test equipment if required

(d) Scheduled maintenance and/or checks including visual inspections that will detect obvious unsatisfactory conditions/discrepancies but do not require extensive in-depth inspection. It may also include internal structure, systems and powerplant items which are visible through quick opening access panels/doors

(e) Minor repairs and modifications which do not require extensive disassembly and can be accomplished by simple means

7.3.2 A written agreement shall exist between the operators or his principal contracted maintenance organisation and the organisation contracted for the performance of line maintenance, detailing the tasks to be performed on behalf of the operator. The arrangements shall be defined in company instructions so that responsibilities procedures and communication paths are made clear to all concerned.

7.3.3 The authorisation of maintenance personnel employed by the line maintenance contractor shall conform to any requirements and limitations imposed by the conditions of the approval granted by the Authority.

7.3.4 It is the responsibility of the operator to ensure that the continuing performance of the line maintenance contractor is such as to ensure safe operation of the operator's aircraft.

7.3.5 The operator or his principal contracted maintenance organisation may sub-contract a maintenance organisation to perform line maintenance activities outside Thailand under item 31 of this Chapter, under such arrangements, the operator shall be responsible for the sub-contractor's performance and the timely completion of the repair station application.

7.4 Contracting out Ground Handling

7.4.1 The operator may enter into Ground Handling Agreements with other organisations for the provision of services associated with aircraft arrival, turnaround and dispatch. In these cases, a written agreement shall exist detailing the tasks to be performed on behalf of the operator.

7.4.2 The operator shall ensure that maintenance or flight crew personnel responsible for accepting the aircraft for flight are made aware of any matter which is not included in the agreement at that station.

7.4.3 The operator shall clearly define the responsibilities for typical matters such as:

(a) Opening and securing of aircraft hold doors: securing and locking when loading is complete;

(b) Draining of water from aircraft fuel tanks;

(c) Maintaining communication between flight deck and ground personnel.

7.4.4 This list is not exhaustive and may vary from operator to operator and station to station. Company instructions to flight crew and maintenance personnel shall identify responsibilities in each case.

7.4.5 It is the responsibility of the operator or his principal maintenance contractor to ensure that the continuing performance of the ground handling contractor is such as to ensure safe operation of the operator's aircraft, and that necessary initial and recurrent training has been performed.

7.5 Contracting out Engine Maintenance

7.5.1 When an operator chooses to contract- out maintenance of engines independently from the overall arrangements existing for maintenance support of the aircraft, the operator shall ensure that the principal maintenance contractor:

(a) Is fully in agreement with the proposed arrangements;

(b) Is kept continuously aware of engine condition monitoring and any adverse trends in reliability or performance which arise, if he is not directly a party to such monitoring;

(c) Is made aware of the status of engines fitted to aircraft in respect of modifications, service bulletins and airworthiness directives; and

(d) Liaises with the engine maintenance contractor in respect of the requirements of the approved maintenance schedule for the aircraft so that the engine maintenance reflects the needs of the aircraft for airworthiness.

7.5.2 The operator shall ensure that at all times the liaison between the aircraft and engine maintenance organisations must be such as to enable the appropriately approved person to carry out Maintenance Review and issue the Maintenance Release and safely discharge his statutory responsibilities when doing so.

8 MAINTENANCE PROGRAMME

8.1 Pursuant to CAAT requirements, an aircraft shall be maintained in accordance with an approved maintenance programme.

8.2 The operator shall provide, for the use and guidance of maintenance and operational personnel concerned, a maintenance programme containing the information required by CAAT requirements. The design and application of the maintenance programme shall observe human factors principles (See Appendix AB for guidelines). The operator shall also ensure that the maintenance of its aircraft is performed in accordance with the approved maintenance programme.

8.3 The copies of the proposed maintenance programme must be prepared and submitted for approval to the Authority. When the maintenance programme is approved the applicant will be formally notified by means of a maintenance programme approval document,

8.4 The operator shall ensure that the maintenance programme is reviewed periodically to ensure that the detailed schedule requirements continue to have practical applicability in the light of experience and adequately meet the maintenance needs of the aircraft if continuing airworthiness in the respective operating circumstances is to be ensured. See Appendix AE for more details.

8.5 The reviews shall take account of variations from the original certification standard of the aircraft which may have occurred as a result of modifications and respond to the recommendations of the manufacturer contained in maintenance manuals and Service Bulletins.

8.6 Changes in the use of aircraft may affect the conditions for approval of the maintenance programme, for example with respect to annual utilisation, average flight duration and operating environment. Amendments to schedules and to engine maintenance programmes shall be submitted for approval in response to significant changes.

8.7 The reviews shall also take account of the age and utilisation of the aircraft and the continuity of corrosion control programmes. More frequent maintenance may be required as aircraft grow older.

8.8 A continuous analysis shall be undertaken of defects arising on the aircraft during flight and at maintenance inputs, from technical logs and from worksheets raised during scheduled maintenance inspections, particularly those where major structural inspections are undertaken. Results of the analysis shall be used to amend the maintenance programme as appropriate to eliminate repetitive defects and trends.

8.9 Copies of all amendments to the maintenance programme shall be furnished promptly to the Authority and all organisations or persons to whom the maintenance programme are issued.

8.10 Notwithstanding the provisions in 8.3, amendment of maintenance programme may be approved indirectly through an indirect approval procedure which be established as part of the GMM as specified in paragraph 2.12 of this Chapter.

9 MAINTENANCE REVIEW (MR)

9.1 The MR is required, to ensure that all maintenance is complete, all mandatory inspections and modifications that are due have been complied with, all defects have been rectified or deferred or carried forward in accordance with approved procedures and that all necessary Certificates of Release to Service have been issued. It shall be performed annually.

9.2 The Authority shall have access in respect of the aircraft being certified, to the approved maintenance schedule and check control system, the mandatory inspection/modification control system, the defect control system, all technical records including worksheets, and to aircraft defects. In the case of computer-controlled record access must likewise be provided.

9.3 Quality Control audit records must be available to the CMR staff on request relative to the aircraft being cleared such that he may discharge his responsibilities under the CAAT Requirements.

9.4 A Certificate of Maintenance Review shall only be issued for the purposes of this article:

(a) By authorised CMR staff on behalf of the operator

(b) If the maintenance review has been completely carried out

9.5 More details about Maintenance Review activities and other requirements can be found in Appendix I of this document.

10 DEFECTS AND OCCURRENCES

10.1 The aircraft continuing airworthiness and the serviceability of operational and emergency equipment shall be ensured by the rectification of any defect and damage affecting safe operation in accordance with approved data, as applicable, while taking into account the approved Minimum Equipment List (MEL) and Configuration Deviation List (CDL).

10.2 The operator shall have a system to ensure that all defects affecting the safe operation of the aircraft are rectified within the limits prescribed by the approved MEL, CDL or maintenance data, as appropriate. Also, that such defect rectification cannot be postponed unless in accordance with a procedure approved by the Authority.

10.3 Any aircraft defect that hazards seriously the flight safety shall be rectified before further flight. Only the licensed aircraft engineer authorised in accordance with paragraph 4.5 of this Chapter or approved maintenance organisation can decide, using approved data, whether an aircraft defect hazards seriously the flight safety and therefore decide when and which rectification action shall be taken before further flight and which defect rectification can be deferred. However, this does not apply when the MEL is used.

10.4 Any aircraft defect that would not hazard seriously the flight safety shall be rectified as soon as practicable, after the date the aircraft defect was first identified and within any limits specified in the maintenance data or the MEL.

10.5 Any defect not rectified before flight shall be recorded in aircraft technical log system.

10.6 An assessment of both the cause and any potentially hazardous effect of defects or combination of defects that could affect flight safety shall be described in the GMM which shall be made in order to initiate any necessary further investigation and analysis to identify the root cause of the defect.

10.7 A system of assessment e.g. through reliability programme, should be in operation to support the continuing airworthiness of aircraft and to provide a continuous analysis of the effectiveness of the operator's control systems in use.

10.8 The system should provide for the following:

(a) Significant Incidents and Defects. The monitoring on a continuous basis of incidents and defects that have occurred in flight and of defects found during maintenance and overhaul, highlighting any that appear significant in their own right.

(b) Repetitive Incidents and Defects. The monitoring on a continuous basis of defects occurring in flight and found during maintenance and overhaul, highlighting any that are repetitive.

(c) Deferred and Carried Forward Defects. The monitoring on a continuous basis of deferred and carried forward defects.

(d) Unscheduled Removals and System Performance. The analysis of unscheduled component.

11 DEFERRED DEFECTS

11.1 Deferred defects in this Chapter are defined as those defects reported in operational service which are deferred for later rectification, or defects arising during maintenance which are carried forward for rectification at a later maintenance input.

11.2 When deferring a defect rectification, the cumulative effect of a number of deferred defects on a given aircraft and any restrictions contained in the MEL should be considered.
All deferred defects and their rectification shall be made known to the pilot/flight crew, whenever possible, prior to their arrival at the aircraft.

11.3 The systems for controlling deferred defects must be described in the General Maintenance Manual (GMM)

11.4 There shall be a procedure to ensure that the period for which defects are deferred reflects the importance of the defect as it affects airworthiness and/or safe operation. Limitation periods to be applied shall be identified in the GMM (e.g. flight hours, calendar time, number of sectors, return to base). The control system shall ensure that the number of defects and the length of time during which each defect is deferred are kept to a minimum.

11.5 There shall be a procedure to ensure that deferred defects are transferred on to worksheets at appropriate maintenance check, and to ensure that deferred defects which have not been rectified during the maintenance check, are re-entered on to a new deferred defect record sheet. The original date of the defect must be retained.

When transferring a defect to the deferred sheets or appropriate monitoring system, the conditions approved by the Authority for the control of deferred defects must be complied with.

11.6 The procedure shall ensure that the necessary components or parts needed for the rectification of defects are made available or ordered on a priority basis, and fitted at the earliest opportunity.

11.7 There shall be cross references between the Technical Log system or maintenance check and the deferred defect sheets to enable each defect which has been deferred to be traced back to its original entry.

12 REPETITIVE DEFECTS

12.1 There shall be a system to control and monitor repetitive defects on a continuous basis appropriate to the number of aircraft operated and the nature of the operation. The system shall ensure that the history of a particular repetitive defect is not lost at scheduled inspections. A limit to the number of times a particular defect may be repeated shall be established, after which it shall be brought to the attention of a senior person in the Organisation, usually the Quality Manager. This person is responsible for ensuring that positive action is taken to obviate a further repetition of the defect.

12.2 Defects shall be recorded in a standardised way to assist in identifying which problems are repetitive. The operator shall ensure that line and outstation maintenance personnel have access to repetitive defect information. The defect recording system shall also include a method to enable flight crews to identify recurring/repetitive defects. See Appendix AC for guidelines.

13 INSTRUCTIONS TO MAINTENANCE PERSONNEL

13.1 In addition to the technical and procedural contents of documents such as maintenance manuals and the General Maintenance Manual prepared by the operator, there is a need for a system of bulletins or instructions with which to advise maintenance personnel of matters of immediate technical importance, and to define company practices where these differ from other published information.

13.2 The operator shall ensure that there is a system for publishing instructions which shall be:

(a) Distributed individually to maintenance personnel or in such a way that each person has access to a copy and there is a record kept to show that he has seen each document issued

(b) Numbered sequentially and dated. Where instructions are revised an issue or revision number must be shown

(c) Identified as to content, e.g. by ATA Chapter or by aircraft type number so as to permit easy access to particular subjects

13.3 The principal source of matters to be addressed by the issue of instructions is expected to be the in-service experience of the aircraft being operated and maintained, to which the maintenance organisation finds a need to respond with guidance to maintenance personnel. Other sources of information include CAAT requirements, in-service experience reports and similar continuing airworthiness information published by airworthiness authorities and manufacturers.

13.4 Where instructions are issued which conflict with, or vary, information published by manufacturers or other sources it must be clearly shown which information takes priority. It must also be ensured that instructions cannot be construed as overriding published mandatory information or concern matters beyond the scope of the approval held by the organisation.

14 TECHNICAL RECORDS

14.1 There shall be a department responsible for the compilation and co-ordination of technical records. It shall maintain a data recording system:

(a) Such that it is possible to ensure that the hours of service or elapsed times quoted in the approved maintenance schedule are not exceeded as regards components and structural assemblies, and that scheduled maintenance periods are adhered to.

(b) To record the number of landings/flights/cycles, and the use of maximum contingency or intermediate contingency power, when this information is specified in the approved Maintenance Schedule or manufacturer's manuals as a basis for inspection or other necessary action.

(c) To process the foregoing information into aircraft, engine and propeller log books or equivalent records, to maintain the records and documents concerning overhaul and repair work, component changes, mandatory modifications and inspections and to maintain the Modification Record Book.

(d) To maintain records required by the Authority.

14.2 A computer may be used as part of a technical records system. In this case procedures shall be instituted which will ensure that the computerised record will provide security, storage, preservation and retrieval to the same level as would have been achieved by hard copy records. The Authority's acceptance of computerised recording does not exempt the operator or his contracted maintenance organisation from complying with the appropriate provisions of CAAT Requirements for the keeping and retention of records.

14.3 Records shall be structured or stored in such a way as to facilitate auditing.

15 DOCUMENTATION FOR MAINTENANCE CHECKS

15.1 The department responsible for technical records shall also be responsible for the accuracy of the documents issued for a maintenance check and shall maintain a procedure to ensure that only documents incorporating the latest amendments are issued, and that all superseded documents are withdrawn and cancelled. Working documents made available for use by maintenance staff such as worksheets or cards shall include:

(a) A list of inspections, checks or work items required to meet the requirements of the approved maintenance schedule and adequate directions for their implementation

(b) The part numbers and serial numbers (unless not relevant to component control) of all components to be removed and replaced, and their locations on the aircraft

(c) Details of any modifications which have to be incorporated during the check

(d) Any mandatory or special inspections, or any other checks which are required to be made by the company in addition to those required by the approved maintenance schedule

(e) Detailed procedures for engine runs, engine or propeller change, fuel flow tests, duplicate inspection of controls, landing gear retraction tests etc., as applicable

(f) A list of outstanding deferred defects

15.2 Additional worksheets or cards shall be provided for recording the work completed as a result of the maintenance check and any defects arising from inspections.

15.3 All worksheets or cards shall be readily identifiable and shall bear an issue number. They shall also be identified to associate them positively with the relevant items in the maintenance schedule. The procedures for documentation control shall ensure that if any worksheet or card is mislaid or lost this will be readily apparent on completion of the check, and that each 'pack' of worksheets or cards is complete and certified before the aircraft is released for service.

15.4 Before issue, all worksheets or cards should be recorded on a 'workpack control' sheet which shall also state the following:

(a) Name and the Authority Approval reference of the maintenance organisation.

(b) Aircraft type and registration marks.

(c) The maintenance check to be carried out.

(d) The date.

(e) The approved maintenance programme reference number and amendment state.

(f) The name of the operator.

15.5 Technical records are deemed to be essential records and may not be destroyed before the required detention periods.

15.6 The compilation of maintenance check documentation may, alternatively, be allocated to a maintenance planning department. In such cases the company General Maintenance Manual must contain details not only of the procedures of the planning department through which the documentation is compiled but also of the monitoring programme exercised by quality assurance.

16 AIRWORTHINESS DIRECTIVES AND MANUFACTURERS TECHNICAL INFORMATION

16.1 The operator shall have procedures and the necessary personnel to ensure that Airworthiness Directives are complied with as required. It must be clear, when maintenance is in any way subcontracted, that responsibility for compliance with mandatory airworthiness information such as Airworthiness Directives lies with the operator.

16.2 When assessing the overall capability of the operator provide satisfactory maintenance the following shall be taken into account:

(a) The assessment of incoming technical information relating to relevant aircraft types (e.g. service bulletins) from manufacturers, Mandatory Continuing Airworthiness Information (MCAI e.g. ADs) from State of Design, and from the Authority.

(b) Initiating action as necessary on such information, particularly in relation to the Maintenance Schedule.

(c) Responding to requests by the Manufacturer and the Authority, to have 'in-service' experience reports transmitted for their evaluation.

Note:- *The Authority may require access to an operator's assessments of manufacturer's service information to assist in evaluation of such information for the purpose of possible mandatory classification.*

16.3 The operator shall obtain and assess airworthiness information from the manufacturer, State of Design, and the Authority. When the information is received, an immediate assessment shall be made to establish priority of response. Matters of significant airworthiness importance, such as those having an impact on or EDTO flights, shall be responded to promptly.

16.4 By means of Modification Records, Technical Records, Log Books or other means adopted by the operator it must be possible at any time to establish the record of compliance with Directives and Service Information for each of the operator's aircraft.

16.5 Operators shall ensure that the relevant aircraft manufacturer is aware that they are users of his aircraft so that all relevant service information, details of in-service experience of the aircraft and amendments to manuals, including the Flight Manual, are received and embodied in a timely manner. This is especially important where the operator is not the original owner of the aircraft, or it has been leased from the owner.

16.6 Where manuals, including the Flight Manual, have been prepared or amended by an agency other than the manufacturer, the operator must ensure that amendments are prepared as necessary, submitted to the Authority for acceptance or approval and incorporated into manuals promptly.

17 DOCUMENT MANAGEMENT

17.1 The technical library must hold and make available to personnel concerned the necessary technical data, e.g. CAAT Requirements, manufacturer's manuals, any relevant service information, any other related literature appropriate to the aircraft types covered by the AOC and copies of appropriate company manuals, procedures and Instructions. A person must be appointed to be responsible for the technical library.

17.2 Arrangements shall be made for:

(a) The supply of amendments, so that all publications are kept up-to-date, and for departments concerned to be notified of such amendments, and of any additional technical information relevant to the work undertaken.

(b) Maintenance manual information recorded on microfilm, microfiche or disk to be checked at specific intervals for amendment state and legibility, and any temporary amendments to be kept available adjacent to each reader.

17.3 Arrangements shall be made for all technical drawings to be suitably stored and a procedure operated to ensure that only drawings of the correct issue are released. A person shall be made responsible for maintaining an up-to-date record of drawings available and also for notifying departments concerned when drawings have been superseded by a later issue.

17.4 The technical library shall make arrangements for manuals or sections of manuals, schedules, service information, etc., appropriate to the work undertaken, to be made available to line maintenance stations and a suitable procedure maintained to ensure that such information is kept up to date.

17.5 Microfilm, microfiche and compact disk viewing and printing equipment must be available, as appropriate, at each location where manuals in these formats are in use, and in the library. Adequate arrangements must be made for regular maintenance of the equipment and users should be made aware of contact points for servicing and repair.

18 SPARES

18.1 Provision and Storage. The operator should provide for sufficient spares to be available to ensure that aircraft, engine and equipment defects can be rectified. Spares should be located where they will be required to be used.

18.2 Account has been taken of the operator's Minimum Equipment Lists (MEL) to ensure that essential spares to support the rectification of defects in systems required for operation are placed where they are most likely to be needed and, in such numbers, as to ensure that successive defects can be addressed.

18.3 The Authority may examine spares provisioning arrangements and any agreements entered into to ensure that adequate support for defect rectification is being made. Where necessary the Authority may require additional provisions to be made.

18.4 Spares provisions at each maintenance location should be determined when the particular base or station is commissioned and published in the operator instructions/ procedures defining the maintenance operations undertaken at the particular location.

18.5 Spares holdings should be reviewed at regular intervals at all locations to ensure that:

(a) Redundant items are removed, e.g. for aircraft no longer operated.

(b) Superseded parts, or those with out of date modifications states, are removed for replacement or up-dating.

(c) Previously assessed numbers of spares remain adequate for support in relation to routes, frequency of flights and numbers of aircraft.

(d) Airworthiness Directives and other mandatory requirements published while parts are in storage are complied with before the part is released for service.

18.6 Storage Procedures. Every spare has to be stored, at all times and locations, in accordance with its manufacturer's instructions and in such a manner such that it remains airworthy and fit for use when required. The following shall be considered at least in the storage procedures.

(a) Procedures to control the return-to-store items issued for use but not needed, especially where the item has been installed in the aircraft and subsequently removed. The removal of components from completed assemblies must be controlled and identified.

(b) Spares having a limited allowable shelf life, including materials and consumable products, must be identified and controlled.

(c) Stores references or batch numbers should be recorded on worksheets, cards or technical log pages so as to facilitate subsequent tracing of the associated part to source.

(d) Management procedures and conditions of storage must be reviewed regularly to ensure that satisfactory standards are being implemented.

18.7 The operator shall ensure that all spares, tools, equipment, and parts to be used comply with Repair Station Certificate Requirements as applicable.

19 INSTRUCTIONS TO FLIGHT CREWS

19.1 Operators shall include written instructions in the General Maintenance Manual so that:

(a) Pilots-in-command are advised of the action to be taken to obtain engineering assistance when aircraft are away from main base, of the procedures which are acceptable for any necessary certifications, and of the procedure to be adopted where any doubt exists over work being carried out by any other organisation, or which cannot be certified.

(b) Where no arrangements have been made in respect of engineering support at route stations, pilots in-command are advised of the procedures to be followed for reporting defects to main base.

(c) Where it is desired to transmit advisory information of a temporary nature to flight crews, e.g. in respect of modifications to the aircraft, trial installations or other changes which the crew need to be aware of during their operation of the aircraft, or which impose operating restrictions, an information sheet should be included in the technical log containing the relevant data.

20 AIRCRAFT RE-FUELLING - QUALITY ASSURANCE

20.1 The operator must be satisfied with the quality of all fuel taken on board his aircraft, particularly in respect of freedom from water contamination.

20.2 The operator must comply with the provisions of the IATA Fuel Guidelines on Aviation Fuel at Aerodromes if he has a facility or vehicle in which fuel is stored and/or delivered to aircraft, to ensure that fuel dispensed is fit for use in aircraft.

20.3 The operator is required to:

(a) Keep a record of the fuelling arrangements at each station where fuel is uplifted, indicating the company or person responsible for monitoring the fuel supplier. This may be a nominated airline at each location, or the operator may, himself, choose to monitor the supplier's quality performance.

(b) Institute a fuel uplift sampling programme taking into account matters such as the following

(i) Known supplier quality performance, including any history of contamination.
(ii) Local environmental conditions, e.g. likely sources of contamination including microbiological contamination.
(iii) Supply facilities.
(iv) Frequency of use.

(c) Provide flight crew with guidance on the accomplishment of fuel uplift sample checks and clear instructions as to when these are to be carried out.

(d) Provide maintenance personnel with guidance, in respect of fuel quality sampling, in relation to their station. Ensure that persons engaged in refuelling activities are properly trained for their tasks.

(e) Audit the arrangements as defined to ensure the continuing acceptability of fuel quality throughout the operation.

20.4 The minimum frequency of fuel contamination checking, at the point of uplift, must be declared in guidance to maintenance personnel and acceptable to the Authority.

20.5 The control of fuel storage and dispensing by suppliers should conform to the IATA Fuel Guidelines.

21 SPECIAL OPERATIONS - MAINTENANCE REQUIREMENTS

21.1 All Weather Operations

21.1.1 The operator or his maintenance organisation must publish guidance to maintenance personnel and flight crews on the control of the validity of all-weather categorisation. This guidance should take the form of:

(a) A list of the systems required to be fully serviceable in order to qualify the aircraft for Category II or III operations.

(b) A company procedure for the control of the modification status of the equipment fitted in the required systems which are deemed to be 'sensitive' in terms of all-weather operations.

(c) Placards applied to both equipment and installation to alert maintenance personnel to the need to fit only controlled equipment.

(d) Procedures for downgrading all weather capability from Category III or II to Category I in the event that an uncontrolled item of equipment is fitted or after any defect in an affected system or any event which results in disturbance of the system.

(e) Procedures for up-grading capability from Category I to Category II or III as appropriate when serviceability is proven, normally by performing a successful Category II approach or Category III landing in Category 1 weather conditions (sometimes referred to as a standard landing).

21.1.2 Provision shall be made to inform the crew of the Category II or III status of the aircraft before the flight is begun.

21.1.3 When setting alert levels in system reliability monitoring, consideration must be given to the levels of reliability assumed in qualifying the aircraft for Category 2 or 3 operations. Significant trends must be responded to promptly or all-weather classification must be suspended until remedial action has been taken. See Appendix AD for guidelines.

21.2 Extended Diversion Time Operations (EDTO)

21.2.1 The operator requesting for an EDTO specific approval shall prepare and implement a maintenance programme and procedures in accordance with Chapter 2, paragraph 22 of this document.

21.3 Reduced Vertical Separation Minima (RVSM)

21.3.1 The operator requesting RVSM specific approval shall submit and implement a maintenance and inspection programme as part of a continuing airworthiness maintenance programme approval pertaining to altimeter system and altitude reporting equipment test and inspections. An effective maintenance and inspection programme shall incorporate these provisions as a requirement for maintenance programme approval.

21.3.2 The integrity of the design features necessary to ensure that altimetry systems continue to meet RVSM standards shall be verified by scheduled tests and inspections in conjunction with an approved maintenance program. The operator shall review its maintenance procedures and address all aspects of continuing airworthiness which are affected by RVSM requirements.

21.3.3 Each operator shall demonstrate that adequate maintenance facilities are available to ensure continued compliance with the RVSM maintenance requirements.

21.3.4 Each operator requesting RVSM specific approval shall submit a maintenance and inspection program which includes any maintenance requirements defined in the approved data package as part of a continuous maintenance program approval.

21.3.5 The Maintenance Manual, Structural Repair Manual, Standards Practices Manual, Illustrated Parts Catalogues, Maintenance Schedule, and MMEL/MEL should be reviewed as appropriate for RVSM maintenance approval.

21.3.6 If the operator is subject to an ongoing approved maintenance program, that program shall contain the maintenance practices outlined in the applicable aircraft and component manufacturer's maintenance manuals for each aircraft type. The following items shall be reviewed for compliance for RVSM approval and if the operator is not subject to an approved maintenance program the following items shall be followed:

(a) All RVSM equipment shall be maintained in accordance with the component manufacturer's maintenance requirements outlined in the approved data package.

(b) Any modification, repair, or design change which in any way alters the initial RVSM approval, shall be subject to a design review by persons approved by the approving authority.

(c) Any maintenance practices which may affect the continuing RVSM approval integrity, e.g. the alignment of pitot/static probes, dents, or the deformation around static plates, shall be referred to the Authority.

(d) Built-in Test Equipment (BITE) checking is not an acceptable basis for calibrations, (unless it is shown to be acceptable by the airframe manufacturer with the approval of the Authority) and should only be used for fault isolation and troubleshooting purposes.

(e) Some aircraft manufacturers have determined that the removal and replacement of components utilising quick disconnects and associated fittings, when properly connected, will not require a leak check. While this approach may allow the aircraft to meet static system certification standards when properly connected, it does not always ensure the integrity of the fittings and connectors, nor does it confirm system integrity during component replacement and reconnections. Therefore, a system leak check or visual inspection should be accomplished any time a quick disconnect static line is broken.

21.3.7 Airframe and static systems shall be maintained in accordance with the airframe manufacturer's inspection standards and procedures.

21.4 Minimum Navigation Performance Specifications (MNPS) and Required Navigation Performance (RNP)

21.4.1 The operator requesting MNPS specific approval shall submit navigational equipment used, together with its installation and maintenance procedures.

21.4.2 Aircraft operating within MNPS Airspace are required to meet a Minimum Navigation Performance Specification (MNPS) in the horizontal plane through the mandatory carriage and use of a specified level of navigation equipment which has been approved by the Authority. Such approvals encompass all aspects affecting the expected navigation performance of the aircraft.

21.4.3 Approval for MNPS operations will require the checking by the Authority of various aspects affecting navigation performance. These aspects include the navigation equipment used, together with its installation and maintenance procedures, crew navigation procedures employed and training requirements.

21.4.4 Longitudinal separations between subsequent aircraft following the same track (in-trail) and between aircraft on intersecting tracks in the NAT MNPS Airspace are assessed in terms of differences in ATAs/ETAs at common waypoints. The longitudinal separation minima currently used in the NAT MNPS Airspace are thus expressed in clock minutes. The maintenance of in-trail separations is aided by the application of the Mach Number Technique. However, aircraft clock errors resulting in waypoint ATA report errors can lead to an erosion of actual longitudinal separations between an aircraft. It is thus vitally important that the time-keeping device intended to be used to indicate waypoint passing times is accurate, and is synchronised to an acceptable UTC time signal before commencing flight in MNPS Airspace. Thus, the pre-flight procedures for any NAT MNPS operation must include a UTC time check and resynchronisation of the aircraft Master Clock.

21.4.5 There are two navigational requirements for aircraft planning to operate in MNPS Airspace. One refers to the navigation performance which shall be achieved, in terms of accuracy. The second refers to the need to carry standby equipment with comparable performance characteristics. Thus, in order to justify consideration for approval of unrestricted operation in the MNPS Airspace an aircraft must be equipped with the following:

(a) Two fully serviceable Long Range Navigation Systems (LRNSS). A LRNS may be one of the following:

(i) One Inertial Navigation System (INS);

(ii) One Global Navigation Satellite System (GNSS); or

(iii) One navigation system using the inputs from one or more Inertial Reference System (IRS) or any other sensor system complying with the MNPS requirement.

(b) Each LRNS must be capable of providing to the flight crew a continuous indication of the aircraft position relative to desired track.

(c) It is highly desirable that the navigation system employed for the provision of steering guidance is capable of being coupled to the autopilot.

21.4.6 Operators requesting for specific approval where a navigation specification for PBN or an RCP or RSP specification for PBCS has been prescribed must be equipped with navigation equipment which will enable it to operate in accordance with the prescribed navigation specification(s), and also have appropriate maintenance procedures to ensure continued airworthiness in accordance with the prescribed specification(s).

21.4.7 The applicable navigation specification(s) approval will be issued by The Authority when satisfied that the aircraft equipment together with the maintenance and operating procedures are sufficient to support such operations.

22 PREPARATION OF AIRCRAFT FOR FLIGHT

22.1 The operator must ensure that the Operations Manual and Maintenance Schedule contain a pre-flight inspection to be completed by the crew or by maintenance personnel where available, with which to verify that the aircraft continues to be serviceable. Details of this inspection shall also be included in the technical log.

22.2 The operator shall provide information, preferably, in the Technical Log, to advise the Pilot-in-command when the next Scheduled Maintenance Inspection (SMI) is due, by flying hours and calendar time, any defects existing on the aircraft affecting its operational airworthiness and safety, and any maintenance actions falling due before the next SMI.

22.3 Where a procedure acceptable to the Authority exists for the control of maintenance actions necessary between scheduled maintenance inspections it may not be practicable to include full details in the Technical log. In such cases, it should be possible for flight crew to verify, with the assistance of maintenance personnel if necessary, that no maintenance task is due or will become due before the end of the intended flight.

22.4 The operator shall provide any other information to the crew concerning the aircraft and its systems, including changes resulting from modifications, which may affect the operation of the aircraft.

22.5 The operator shall have management and quality assurance procedures which will ensure that whether the aircraft is dispatched by the Operator or the task is wholly or partly sub-contracted:

(a) Fuel uplifted prior to flight is free from contamination.

(b) Refuelling of the aircraft is carried out in a controlled manner taking into account essential safety measures for fire prevention.

(c) Baggage and cargo is loaded and restrained in accordance with Flight Manual limitations and that cargo doors are securely fastened.

(d) Push-back and start-up are carried out to a standard procedure for the specific type of aircraft, under the control of a suitably trained person, that the area in which engines will be started is free from debris and contamination likely to damage the engines and that fire-fighting facilities are immediately available.

(e) Control surface and landing gear locks, restraint devices and blanks are removed.

(f) Proper attention is given to the rectification of recorded defects, compliance with the MEL and any limitations imposed in respect of the period of flights, flying hours or calendar time.

(g) The aircraft is serviced and inspected as required by the approved maintenance schedule.

23 CABIN RECONFIGURATION – APPROVAL AND CONTROL

23.1 Any change to the cabin configuration from that for which the aircraft was first certificated constitutes a modification which must be approved by the Authority.

23.2 Revised or alternative seating layouts, the fitting of stretchers or the conversion of the cabin to a cargo carrying role all constitute modifications which shall conform to an approved design and be certified with the issue of a Certificate of Release to Service (CRS). CRS must be issued for each change of configuration, including a restoration to the previous configuration. The CRS shall refer to the modification being embodied or removed but may do so through reference to a company instruction or role diagram, etc which directly records compliance with the requirements of the modification.

23.3 The Operations Manual and instructions to maintenance personnel must contain precise descriptions, preferably pictorial, of the approved configuration and any limitations to be observed. It is recommended that the various actions necessary are summarised in a checklist in each case, particularly in respect of the fitting or securing of emergency equipment and exits. Checklists shall be readily available to personnel when carrying out configuration changes.

23.4 Where any possibility of error exists, such as in the position of seats and of fitting incorrect seats at and adjacent to emergency exits, the aircraft and the item to be fitted shall be clearly marked and the pictorial diagram of the configuration shall illustrate the arrangement.

23.5 Clear and easily interpreted guidance must be given to persons responsible for loading and securing the aircraft for flight so that the conditions of the approved modification are observed. In cases where the main cabin is used for the carriage of cargo it should be possible to readily install a configuration embodying method of restraint which will ensure compliance with cabin design limitations without the need for extensive calculations at the point of dispatch.

23.6 It must be ensured that all cabin configurations are fully represented in aircraft prepared for service weights and indices used in the loading calculations made prior to flight dispatch.

23.7 Approved modifications for cargo configurations should contain the various restraint practices used by the operator to facilitate the satisfactory carriage of different types.

23.8 The cargo containers and pallets used either in cargo holds or the main cabin, particularly where the container itself is designed to provide necessary restraint and, in some cases, fire containment should also be properly maintained. Care and maintenance should include details of permissible damage and any limitations, procedure for the assessment of containers and details of repair action to be taken.

24 AIRCRAFT EXTERNAL DAMAGE MARKING

24.1 In the course of normal service aircraft may suffer external damage in the form of scratches and minor dents, corrosion, and deformations as a result of collision with ground service equipment, access steps and vehicles, collision with objects, severe environment, and etc.

24.2 The operator shall have a system for identifying such damage after inspection and acceptance so that it is readily apparent when new damage occurs. The assessment and acceptance of the damage shall be recorded.

24.3 Damage shall be entered in a record kept in the aircraft either directly on pictorial diagrams or by use of a grid referencing system: Such records may be included in the technical log or another readily available document.

24.4 When considered desirable as a means of prompt recognition of accepted damage it is acceptable for the actual damage to be marked using a suitable method of identification.

24.5 The damage record for each aircraft shall be reviewed by the operator from time to time to ensure that it has been kept up to date, that repaired damage is not removed from the aircraft record and that the cumulative effects of damage do not exceed manufacturers limitations.

25 AIRCRAFT FURNISHINGS

25.1 The operator must have adequate control over the cleaning of aircraft furnishing materials. For this, they need to have knowledge of the material type, the recommended cleaning or proprietary finishing processing methods, the effects of time in service on the flame resistance properties, the flame-retardant processes applied, if any, and the method of re-application of such a process, where this is necessary.

25.2 Where materials, e.g. seat covers, require the application of a proprietary flame-retardant process in order to satisfy airworthiness requirements it is strongly recommended that each item is identified with the number and type of cleaning actions it receives until it is re-proofed.

26 MAINTENANCE OF CABIN AND OTHER SAFETY PROVISIONS

26.1 Provisions made for the safety of passengers in flight and in the event of emergency alighting may be subject to abuse by passengers either deliberately or by virtue of frequent use. It is therefore essential that regular inspections take place to ensure that the means by which the particular provision is implemented remain valid and any defined or implied inspection requirements are accomplished.

26.2 In some cases re-configuration of the cabin can result in seat positions, placards and emergency equipment being moved or omitted. Subjects which require frequent monitoring include the following matters:

(a) Stowage and accessibility of lifejackets

(b) Continuing compliance, and test, of floor proximity escape path marking

(c) Checking of cabin and toilet smoke detector systems

(d) Access to and functioning of type III and IV exits

(e) Integrity of cargo compartment fire containment capability, linings and seals

(f) Inspection of catering carts and trolleys, brakes, restraints and placards

(g) Functional test of inflatable escape chutes and flotation devices (aeroplanes and helicopters)

(h) Continuity integrity of toilet fire precautions

(i) Protection of life rafts and flotation bags from damage after deployment

(j) Compliance with approved cabin configuration for seat positions, access to exits and minimum space for seated passengers, particularly where seats are regularly removed and refitted

(k) Statutory provisions for the marking of exits and break-in areas

27 TECHNICAL LOG BOOK

27.1 Upon rectification of any defect which has been entered in the technical log there shall be Certificate of Release to Service issued readily identifiable with the defect entry to which it relates.

27.2 Technical log page format must be including in the general maintenance manual.

28 MAINTENANCE FACILITIES

28.1 General

28.1.1 When the operator performs maintenance of his own aircraft, engines, propellers, appliances, emergency equipment items, and parts, such maintenance shall comply with CAAT requirements.

28.1.2 The operator may contract engineering and maintenance functions to a separate organisation approved or accepted by the Authority. However, responsibility for the airworthiness of the operator's aircraft remains with the operator.

28.2 Line Maintenance Facilities

28.2.1 The numbers and qualifications of staff at line stations must be sufficient to perform the tasks allocated to the station. Shift arrangements must ensure that persons are available when needed and to ensure continuity of control over servicing and dispatch activities. Arrangements must be made to ensure that oncoming shifts are made fully aware of any outstanding or incomplete task.

28.2.2 Scheduled or pre-planned tasks must only be allocated to line stations where sufficient staff and down-time are available to perform the task, in a manner commensurate with its airworthiness significance, the working conditions are appropriate to the nature of the task and the necessary tools, equipment, test apparatus and technical instructions are available.

28.2.3 The operator shall ensure that each line station is provided with, as applicable:

(a) A summary of the technical literature provided for the station. The list shall be kept up to date and made available to the technical library so that amendments and periodic checks of currency can be made.

(b) A summary of the station spares holding with an indication of which items are held for priority purposes, e.g. to meet possible MEL compliance requirements or EDTO dispatches etc.

(c) Company procedures and technical instructions appropriate to the aircraft types supported.

(d) Such extracts from the maintenance schedule, in the form of worksheets or cards etc, as are necessary to perform the tasks allocated to the station.

(e) Access to deferred and repetitive defect information to assist in the diagnosis of reported defects.

(f) Details of any subcontracts for line support, fuel supply, loading and ground handling entered into by the Operator to enable the person responsible for dispatch to ensure that all significant airworthiness tasks are satisfactorily accomplished.

(g) Maintenance facilities and working accommodation appropriate to the scale of work and undertakings of the station.

(h) Ground support equipment as appropriate including equipment or access to equipment for the ground de-icing, anti-icing of aircraft as necessary.

29 GROUND DE-ICING AND ANTI-ICING

29.1 It must be ensured that de-icing equipment is checked immediately before the commencement of winter operations and at intervals throughout the winter season to verify that the equipment is fully serviceable at each location where aircraft are likely to require de-icing.

29.2 Items such as mixer nozzles must be correctly calibrated and it must be ensured that they are not replaced with incorrectly calibrated nozzles during the winter season.

29.3 Satisfactory procedures for checking mixtures of de- icing fluids must be established together with suitable conditions for the storage and identification of de-icing fluid.

29.4 Where facilities for common use are provided at airports or this task is contracted out to a specialist organisation such audit checks must be carried out by the operator as are necessary to ensure that de-icing/anti-icing of his type of aircraft will be carried out effectively and in a manner to ensure subsequent safe operation.

30 QUALITY CONTROL AND ASSURANCE

30.1 General

30.1.1 The operator's systems for quality assurance must take into account all of the facilities and procedures utilised to ensure continuing airworthiness, at each of the operator's locations where activities take place affecting the airworthiness of the aircraft.

30.1.2 Quality assurance must therefore be effective throughout the operation and maintenance of aircraft and quality auditing must ensure that control is being properly applied and achieving satisfactory results.

30.1.3 The operator's quality assurance policies and systems must be described in the General Maintenance Manual together with the Quality Assurance audit programme.

30.1.4 The operator shall ensure that the quality department is adequately staffed by appropriately trained personnel (including recurrent training) to discharge his responsibilities.

30.2 Procedures

30.2.1 Staff assigned to quality assurance duties must be:

(a) Sufficiently experienced in the company systems and procedures and technically knowledgeable of the aircraft being maintained so as to enable them to perform their duties satisfactorily;

(b) Experienced in the techniques of quality control and assurance or receive suitable training before taking up their duties;

(c) Given clearly defined terms of reference and responsibility within the organisation.

Note:- *This is particularly important where quality assurance personnel are also expected to perform other duties in the organisation, e.g. to issue CMR or their maintenance certification.*

30.2.2 The department responsible for Quality Assurance must arrange for independent quality audit checks to be carried out on a planned basis. Emphasis shall be placed on the company systems employed to achieve and ensure airworthiness, their suitability and effectiveness. The scope of quality checks should follow the guidelines given at Appendix H.

30.2.3 All quality checks must be recorded and assessed and any criticisms forwarded to the person responsible for the particular facility or procedure for corrective action to be taken. There must be a feedback system for confirming to the quality assurance staff that corrective action has been taken and to ensure that persons concerned with any audit deficiency are kept aware of both the adverse report and the outcome.

30.2.4 The quality audit check record shall be available for the Authority which may require.

31 APPROVED MAINTENANCE ORGANIZATION

An approved maintenance organization shall comply with the CAAT Repair Station Certificate Requirements.

32 REQUIREMENTS FOR THE MAINTENANCE OF APPROVAL

32.1 The operator shall continue to meet the standard necessary to undertake the work for which it is approved and all activities carried out under the approval granted shall be conducted to the satisfaction of the Authority.

32.2 The operator shall be responsible for compliance with CAAT Requirements, associated procedures, and other requirements as may be prescribed by the Authority from time to time.

32.3 The operator shall consult the Authority if any difficulty arises in the interpretation of CAAT Requirements, associated procedures, or on any airworthiness matter which involves new problems or techniques.

32.4 The General Maintenance Manual shall be reviewed periodically by the operator (See Appendix AE for guidelines) and any necessary amendments submitted in duplicate to the Authority for approval.

32.5 The operator shall report to the Authority in writing as soon as possible of any accident or incident occurring in the approved facility.

32.6 The operator shall permit access by Authorised Officers to any of its facilities and shall arrange similar access to foreign organisations undertaking work on its behalf for the purpose of:

(a) Assessing whether the operator and his maintenance contractors continue to comply with the conditions of its approval and whether the activities to which the approval relates are carried out to a satisfactory standard.

(b) Assessing whether a foreign organisation has adequate facilities, staff premises and equipment, the quality of work is satisfactory and coordination, planning and control of all work complies with these requirements.

(c) Assessing whether the policies and procedures stated in the General Maintenance Manual are being observed.

(d) Inspection of aircraft, components, equipment or any work in progress to assess the competence or diligence of engineering staff.

(e) Witnessing tests or inspections in any way associated with establishing the airworthiness of an aircraft, engine or any part thereof.

(f) Investigation of components, equipment or materials which due to unserviceability, manufacturing discrepancies, inadequate control during manufacture, overhaul or processing, inadequate storage, deterioration or contamination have been found to be unsuitable for aircraft use.

(g) Investigation of defects in aircraft, components or equipment and accidents/incidents.

32.7 Where deficiencies or discrepancies have been disclosed to the operator or his maintenance contractor subject to a surveillance inspection, the operator shall ensure that corrective action is taken and advise the Authority of the action taken.

33 FLIGHT RECORDING INSPECTION STANDARDS

As applicable, the operator shall ensure that the flight recording inspection, whether it is carried out by the operator themselves or contracted/sub-contracted, is in accordance with Appendix AG.

CHAPTER 10

AEROPLANE INSTRUMENTS, EQUIPMENT AND FLIGHT DOCUMENTS

***Note 1**: This chapter will apply for only operator of aeroplane, for operator of helicopter will comply with Helicopter Operations Requirements*

***Note 2**: Specifications for the provision of aeroplane communication and navigation equipment are contained in Chapter 10.*

1 GENERAL

1.1 In addition to the minimum equipment necessary for the issuance of a certificate of airworthiness, the instruments, equipment and flight documents prescribed in the following paragraphs shall be installed or carried, as appropriate, in aeroplanes according to the aeroplane used and to the circumstances under which the flight is to be conducted. The prescribed instruments and equipment, including their installation, shall be approved or accepted by the Authority.

1.2 An aeroplane shall carry a certified true copy of the air operator certificate specified in 10.1 of Chapter 1 and Appendix A, and a copy of the operations specifications relevant to the aeroplane type, issued in conjunction with the certificate.

***Note**: Provisions for the content of the air operator certificate and its associated operations specifications are contained in Chapter 1 and Appendix A.*

1.3 The operator shall include in the operations manual a Minimum Equipment List (MEL), approved by the Authority which will enable the Pilot-in-Command to determine whether a flight may be commenced or continued from any intermediate stop should any instrument, equipment or systems become inoperative.

***Note 1**: Guidance on the Minimum Equipment List can be found in Appendix J of this document.*

***Note 2**: Detail of other information for MEL prescribed by the CAAT, is given in CAAT Announcement subject Minimum Equipment List and CAAT Guidance Material for Minimum Equipment List.*

1.4 The operator shall provide operations staff and flight crew with an aircraft operating manual, for each aircraft type operated, containing the normal, abnormal and emergency procedures relating to the operation of the aircraft. The manual shall include details of the aircraft systems and of the checklists to be used. The design of the manual shall observe Human Factors principles.

***Note**: Guidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (ICAO Doc 9683).*

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2 ALL AEROPLANES ON ALL FLIGHTS

2.1 An aeroplane shall be equipped with instruments which will enable the flight crew to control the flight path of the aeroplane, carry out any required procedural maneuvers and observe the operating limitations of the aeroplane in the expected operating conditions.

2.2 An aeroplane shall be equipped with:

(a) Accessible and adequate medical supplies;

(b) Portable fire extinguishers of a type which, when discharged, will not cause dangerous contamination of the air within the aeroplane. At least one shall be located in:

(i) The pilot's compartment; and

(ii) Each passenger compartment that is separate from the pilot's compartment and that is not readily accessible to the flight crew;

Note 1: *Any portable fire extinguisher so fitted in accordance with the certificate of airworthiness of the aeroplane may count as one prescribed.*

Note 2: *Refer to paragraph 2.2.1 for fire extinguishing agents.*

(c) 1) a seat or berth for each person over the age of 24 months;

2) a seat belt for each seat and restraining belts for each berth; and

3) a safety harness for each flight crew seat. The safety harness for each pilot seat shall incorporate a device which will automatically restrain the occupant's torso in the event of rapid deceleration;

Note: *Safety harness includes shoulder straps and a seat belt which may be used independently.*

(d) Means of ensuring that the following information and instructions are conveyed to passengers:

1) when seat belts are to be fastened;

2) when and how oxygen equipment is to be used if the carriage of oxygen is required;

3) restrictions on smoking;

4) location and use of life jackets or equivalent individual flotation devices where their carriage is required; and

5) location and method of opening emergency exits; and

(e) Spare electrical fuses of appropriate ratings for replacement of those accessible in flight.

2.2.1 Any agent used in a built-in fire extinguisher for each lavatory disposal receptacle for towels, paper or waste in an aeroplane for which the individual certificate of airworthiness is first issued on or after 31 December 2011 and any extinguishing agent used in a portable fire extinguisher in an aeroplane for which the individual certificate of airworthiness is first issued on or after 31 December 2018 shall:

(a) Meet the applicable minimum performance requirements of the Kingdom of Thailand; and accepted by the Authority; and

(b) Not be of a type listed in the 1987 Montreal protocol on substances that deplete the ozone layer as it appears in the eighth edition of the handbook for the Montreal protocol on substances that deplete the ozone layer, annex a, group ii.

Note: *Information concerning extinguishing agents is contained in the UNEP Halons Technical Options Committee Technical Note No. 1 – New Technology Halon Alternatives and FAA Report No. DOT/FAA/AR-99-63, Options to the Use of Halons for Aircraft Fire Suppression Systems.*

2.3 An aeroplane shall carry:

(a) The operations manual prescribed in paragraph 1.10 of Chapter 2 and Appendix B, or those parts of it that pertain to flight operations;

(b) The flight manual for the aeroplane, or other documents containing performance data required for the application of paragraph 29 of Chapter 2 and any other information necessary for the operation of the aeroplane within the terms of its certificate of airworthiness, unless these data are available in the operations manual; and

(c) Current and suitable charts to cover the route of the proposed flight and any route along which it is reasonable to expect that the flight may be diverted.

(d) Other documents prescribed by the Authority.

2.4 Marking of break-in points

2.4.1 If areas of the fuselage suitable for break-in by rescue crews in an emergency are marked on an aeroplane, such areas shall be marked as shown below (see figure following). The colour of the markings shall be red or yellow, and if necessary, they shall be outlined in white to contrast with the background.

2.4.2 If the corner markings are more than 2 m apart, intermediate lines 9 cm × 3 cm shall be inserted so that there is no more than 2 m between adjacent markings.

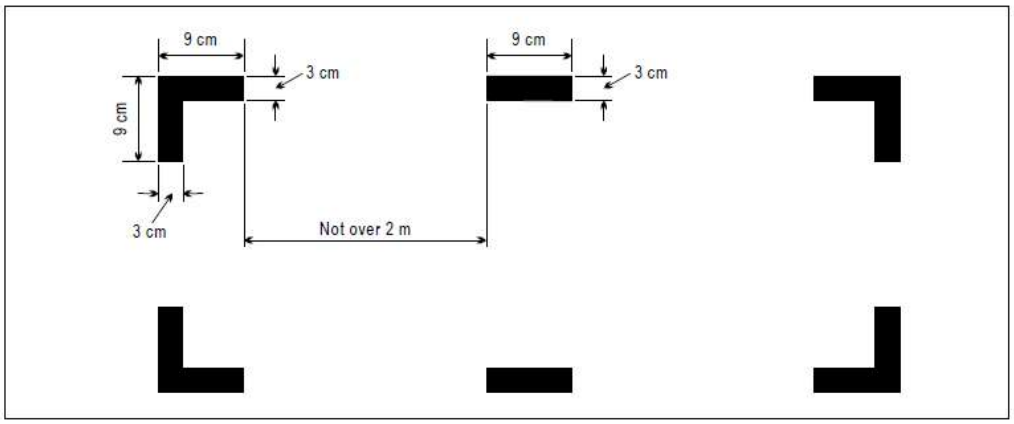

Figure 1 MARKING OF BREAK-IN POINTS (see 2.4)

3 FLIGHT RECORDERS

***Note 1**: Crash-protected flight recorders comprise one or more of the following:*

- a flight data recorder (FDR),
- a cockpit voice recorder (CVR),
- an airborne image recorder (AIR),
- a data link recorder (DLR).

As per Appendix V, image and data link information may be recorded on either the CVR or the FDR.

***Note 2**: Lightweight flight recorders comprise one or more of the following systems:*

- an aircraft data recording system (ADRS),
- a cockpit audio recording system (CARS),
- an airborne image recording system (AIRS),
- a data link recording system (DLRS).

As per Appendix V, image and data link information may be recorded on either the CARS or the ADRS.

***Note 3**: Detailed requirements on flight recorders are contained in Appendix V.*

***Note 4**: For aeroplanes for which the application for type certification is submitted to a Contracting State before 1 January 2016, specifications applicable to crash-protected flight recorders may be found in EUROCAE ED-112, ED-56A, ED-55, Minimum Operational Performance Specifications (MOPS), or earlier equivalent documents.*

Note 5: *For aeroplanes for which the application for type certification is submitted to a Contracting State on or after 1 January 2016, specifications applicable to crash-protected flight recorders may be found in EUROCAE ED-112A, Minimum Operational Performance Specification (MOPS), or equivalent documents.*

Note 6: *Specifications applicable to lightweight flight recorders may be found in EUROCAE ED-155, Minimum Operational Performance Specification (MOPS), or equivalent documents.*

Note 7: *As of 7 November 2019, 10.6 and 10.7 of Chapter 1 contains requirements for States regarding the use of voice, image and/or data recordings and transcripts.*

3.1 Flight Data Recorders and Aircraft Data Recording Systems

Note: *Parameters to be recorded are listed in Tables AD-1 and AD-3 of Appendix V.*

3.1.1 Applicability

3.1.1.1 All turbine-engine aeroplanes of a maximum certificated take-off mass of 5700 kg or less for which the application for type certification is submitted to a Contracting State on or after 1 January 2016 shall be equipped with:

(a) An FDR which shall record at least the first 16 parameters listed in Table AD-1 of Appendix V; or

(b) A Class C AIR or AIRS which shall record at least the flight path and speed parameters displayed to the pilot(s), as defined in 2.2.3 of Appendix V; or

(c) An ADRS which shall record at least the first 7 parameters listed in Table AD-3 of Appendix V.

Note 1: *"The application for type certification is submitted to a Contracting State" refers to the date of application of the original "Type Certificate" for the aeroplane type, not the date of certification of particular aeroplane variants or derivative models.*

Note 2: *AIR or AIRS classification is defined in 6.2 of Appendix V.*

3.1.1.2 All aeroplanes of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 1989 shall be equipped with an FDR which shall record at least the first 32 parameters listed in Table AD-1 of Appendix V.

3.1.1.3 All aeroplanes of a maximum certificated take-off mass of over 5 700 kg, up to and including 27 000 kg, for which the individual certificate of airworthiness is first issued on or after 1 January 1989, shall be equipped with an FDR which shall record at least the first 16 parameters listed in Table AD-1 of Appendix V.

3.1.1.4 All turbine-engine aeroplanes, for which the individual certificate of airworthiness was first issued before 1 January 1989, with a maximum certificated take-off mass of over 5 700 kg, except those in 3.1.1.5, shall be equipped with an FDR which shall record at least the first 5 parameters listed in Table AD-1 of Appendix V.

3.1.1.5 All turbine-engine aeroplanes, for which the individual certificate of airworthiness was first issued on or after 1 January 1987 but before 1 January 1989, with a maximum certificated take-off mass of over 27 000 kg that are of types of which the prototype was certificated by the appropriate national authority after 30 September 1969 shall be equipped with an FDR which shall record at least the first 16 parameters listed in Table AD-1 of Appendix V.

3.1.1.6 All aeroplanes of a maximum certificated take-off mass of over 5 700 kg for which the individual certificate of airworthiness is first issued after 1 January 2005 shall be equipped with an FDR which shall record at least the first 78 parameters listed in Table AD-1 of Appendix V.

3.1.1.7 All aeroplanes of a maximum certificated take-off mass of over 5 700 kg for which the application for type certification is submitted to a Contracting State on or after 1 January 2023 shall be equipped with an FDR capable of recording at least the 82 parameters listed in Table AD-1 of Appendix V.

Note: *Refer to Table AH-1 in Appendix X for FDR/AIR/ADRS/AIRS installation requirements*

3.1.2 Recording technology

FDRs or ADRS shall not use engraving metal foil, frequency modulation (FM), photographic film or magnetic tape.

3.1.3 Duration

All FDRs shall retain the information recorded during at least the last 25 hours of their operation, and, in addition, sufficient information from the preceding take-off for calibration purposes.

3.2 Cockpit Voice Recorders and Cockpit Audio Recording Systems

3.2.1 Applicability

3.2.1.1 All turbine-engine aeroplanes of a maximum certificated take-off mass of over 2 250 kg, up to and including 5 700 kg, for which the application for type certification is submitted to a Contracting State on or after 1 January 2016 and required to be operated by more than one pilot shall be equipped with either a CVR or a CARS.

3.2.1.2 All aeroplanes of a maximum certificated take-off mass of over 5 700 kg for which the individual certificate of airworthiness is first issued on or after 1 January 1987 shall be equipped with a CVR.

3.2.1.3 All turbine-engine aeroplanes, for which the individual certificate of airworthiness was first issued before 1 January 1987, with a maximum certificated take-off mass of over 27 000 kg that are of types of which the prototype was certificated by the appropriate national authority after 30 September 1969 shall be equipped with a CVR.

Note: *Refer to Table AH-2 in Appendix X for CVR/CARS installation requirements*

3.2.2 Recording technology

CVRs and CARS shall not use magnetic tape or wire.

3.2.3 Duration

3.2.3.1 All CVRs shall retain the information recorded during at least the last 2 hours of their operation.

3.2.3.2 All aeroplanes of a maximum certificated take-off mass of over 27000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2022 shall be equipped with a CVR which shall retain the information recorded during at least the last 25 hours of its operation.

3.2.3.3 All aeroplanes that are required to be equipped with CARS, and for which the individual certificate of airworthiness is first issued on or after 1 January 2025, shall be equipped with a CARS which shall retain the information recorded during at least the last two hours of their operation.

3.2.4 Cockpit voice recorder alternate power source

3.2.4.1 An alternate power source shall automatically engage and provide 10 minutes, plus or minus one minute, of operation whenever aeroplane power to the recorder ceases, either by normal shutdown or by any other loss of power. The alternate power source shall power the CVR and its associated cockpit area microphone components. The CVR shall be located as close as practicable to the alternate power source.

Note 1: *"Alternate" means separate from the power source that normally provides power to the CVR. The use of aeroplane batteries or other power sources is acceptable provided that the requirements above are met and electrical power to essential and critical loads is not compromised.*

Note 2: *When the CVR function is combined with other recording functions within the same unit, powering the other functions is allowed.*

3.2.4.2 All aeroplanes of a maximum certificated take-off mass of over 27000 kg for which the application for type certification is submitted to a Contracting State on or after 1 January 2018 shall be provided with an alternate power source, as defined in 3.2.4.1, that powers the forward CVR in the case of combination recorders.

3.3 Data Link Recorders

3.3.1 Applicability

3.3.1.1 All aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January 2016, which use any of the data link communications applications referred to 5.1.2 of Appendix V and are required to carry a CVR, shall record the data link communications messages on a crash-protected flight recorder.

3.3.1.2 All aeroplanes for which the individual certificate of airworthiness was first issued before 1 January 2016, that are required to carry a CVR and are modified on or after 1 January 2016 to use any of the data link communications applications referred to 5.1.2 of Appendix V, shall record the data link communications messages on a crash-protected flight recorder unless the installed data link communications equipment is compliant with a type certificate issued or aircraft modification first approved prior to 1 January 2016.

Note 1: *Refer to Table AH-5 in Appendix X for examples of data link communication recording clarification.*

Note.2: *A Class B AIR could be a means for recording data link communications applications messages to and from the aeroplanes where it is not practical or is prohibitively expensive to record those data link communications applications messages on FDR or CVR.*

Note 3: *The "aircraft modifications" refer to modifications to install the data link communications equipment on the aircraft (e.g. structural, wiring).*

3.3.2 Duration

The minimum recording duration shall be equal to the duration of the CVR.

3.3.3 Correlation

Data link recording shall be able to be correlated to the recorded cockpit audio.

3.4 Flight Crew-Machine Interface Recordings

3.4.1 Applicability

3.4.1.1 All aeroplanes of a maximum take-off mass of over 27 000 kg for which the application for type certification is submitted to a Contracting State on or after 1 January 2023 shall be equipped with a crash-protected flight recorder which shall record the information displayed to the flight crew from electronic displays, as well as the operation of switches and selectors by the flight crew as defined in Appendix V.

Note: *Refer to Table AH-4 in Appendix X for Flight crew-machine interface recordings*

3.4.2 Duration

The minimum flight crew-machine interface recording duration shall be at least for the last two hours.

3.4.3 Correlation

Flight crew-machine interface recordings shall be able to be correlated to the recorded cockpit audio.

3.5 Flight Recorders - General

3.5.1 Construction and installation

Flight recorders shall be constructed, located and installed so as to provide maximum practical protection for the recordings in order that the recorded information may be preserved, recovered and transcribed. Flight recorders shall meet the prescribed crashworthiness and fire protection specifications.

3.5.2 Operation

3.5.2.1 Flight recorders shall not be switched off during flight time.

3.5.2.2 To preserve flight recorder records, flight recorders shall be deactivated upon completion of flight time following an accident or incident. The flight recorders shall not be reactivated before their disposition as determined by the investigation authority and in accordance with the ICAO standards.

Note 1: *The need for removal of the flight recorder records from the aircraft will be determined by the investigation authority in the State conducting the investigation with due regard to the seriousness of an occurrence and the circumstances, including the impact on the operation.*

Note 2: *The operator's responsibilities regarding the retention of flight recorder records are contained in 5 of Chapter 13.*

3.5.3 Continued serviceability

Operational checks and evaluations of recordings from the flight recorder systems shall be conducted to ensure the continued serviceability of the recorders.

Note: *Procedures for the inspections of the flight recorder systems are given in Appendix V.*

3.5.4 Combination recorders

3.5.4.1 All aeroplanes of a maximum certificated take-off mass of over 15000 kg for which the application for type certification is submitted to a Contracting State on or after 1 January 2016, and which are required to be equipped with both a CVR and an FDR, shall be equipped with two combination recorders (FDR/CVR). One recorder shall be located as close to the cockpit as practicable and the other recorder located as far aft as practicable.

Note: *The requirement of 3.5.4 may be satisfied by equipping the aeroplanes with two combination recorders (one forward and one aft) or separate devices.*

Note: *Refer to Table AH-3 in Appendix X for Combination recorder installation requirements*

3.6 Flight Recorder Data Recovery

3.6.1 All aeroplanes of a maximum certificated take-off mass of over 27000 kg and authorized to carry more than nineteen passengers for which the application for type certification is submitted to a Contracting State on or after 1 January 2021, shall be equipped with a means as prescribed in 3.6.2, to recover flight recorder data and make it available in a timely manner.

3.6.2 The means to make flight recorder data available in a timely manner, the operator shall take into account the following:

(a) The capabilities of the operator;

(b) Overall capability of the aeroplane and its systems as certified by the State of Design;

(c) The reliability of the means to recover the appropriate CVR channels and appropriate FDR data; and

(d) Specific mitigation measures.

Note: *Guidance on approving the means to make flight recorder data available in a timely manner is contained in the Manual on Location of Aircraft in Distress and Flight Recorder Data Recovery (ICAO Doc 10054).*

4 ALL AEROPLANES OPERATED AS VFR FLIGHTS

4.1 All aeroplanes when operated as VFR flights shall be equipped with:

(a) A magnetic compass;

(b) An accurate timepiece indicating the time in hours, minutes and seconds;

(c) A sensitive pressure altimeter;

(d) An airspeed indicator; and

(e) Such additional instruments or equipment as may be prescribed by the authority.

4.2 VFR flights which are operated as controlled flights shall be equipped in accordance with 9 of this chapter.

5 ALL AEROPLANES ON FLIGHTS OVER WATER

5.1 Seaplanes

All seaplanes for all flights shall be equipped with:

(a) One life jacket, or equivalent individual flotation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided;

(b) Equipment for making the sound signals prescribed in the international regulations for preventing collisions at sea, where applicable; and

(c) One sea anchor (drogue).

Note: *"Seaplanes" includes amphibians operated as seaplanes.*

5.2 Landplanes

5.2.1 Landplanes shall carry the equipment prescribed in 5.2.2:

(a) When flying over water and at a distance of more than 93 km (50 NM) away from the shore, in the case of landplanes operated in accordance with 29.6 (a) or 29.6 (b) of Chapter 2;

(b) When flying en-route over water beyond gliding distance from the shore, in the case of all other landplanes; and

(c) When taking off or landing at an aerodrome where the take-off or approach path is so disposed over water that in the event of a mishap there would be a likelihood of a ditching.

5.2.2 The equipment referred to in 5.2.1 shall comprise one life jacket or equivalent individual flotation device for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided.

Note 1: *"Landplanes" includes amphibians operated as landplanes.*

***Note 2**: Life jackets accessible from seats or berths located in crew rest compartments are required only if the seats or berths concerned are certified to be occupied during take-off and landing.*

5.3 All Aeroplanes on Long-Range Over-Water Flights

5.3.1 In addition to the equipment prescribed in 5.1 or 5.2 whichever is applicable, the following equipment shall be installed in all aeroplanes when used over routes on which the aeroplane may be over water and at more than a distance corresponding to 120 minutes at cruising speed or 740 km (400 NM), whichever is the lesser, away from land suitable for making an emergency landing in the case of aircraft operated in accordance with 29.6 (a) or 29.6 (b) of Chapter 2, and 30 minutes or 185 km (100 NM), whichever is the lesser, for all other aeroplanes:

(a) Life-saving rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency, provided with such life-saving equipment including means of sustaining life as is appropriate to the flight to be undertaken;

(b) Equipment for making the pyrotechnical distress signals described in regulation of civil aviation board no. 94 on rule of the air; and

(c) At the earliest practicable date, but not later than 1 January 2018, on all aeroplanes of a maximum certificated take-off mass of over 27000 kg, a securely attached underwater locating device operating at a frequency of 8.8 KHz. This automatically activated underwater locating device shall operate for a minimum of 30 days and shall not be installed in wings or empennage.

***Note**: Underwater locator beacon (ULB) performance requirements are as contained in the SAE AS6254, Minimum Performance Standard for Low Frequency Underwater Locating Devices (Acoustic) (Self-Powered), or equivalent documents.*

5.3.2 Each life jacket and equivalent individual flotation device, when carried in accordance with 5.1 a), 5.2.1 and 5.2.2, shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons, except where the requirement of 5.2.1 c) is met by the provision of individual flotation devices other than life jackets.

6 ALL AEROPLANES ON FLIGHTS OVER DESIGNATED LAND AREAS

Aeroplanes, when operated across land areas which have been designated by the State concerned as areas in which search and rescue would be especially difficult, shall be equipped with such signalling devices and life-saving equipment (including means of sustaining life) as may be appropriate to the area overflown.

7 ALL AEROPLANES ON HIGH ALTITUDE FLIGHTS

Note: *Approximate altitude in the Standard Atmosphere corresponding to the value of absolute pressure used in this text is as follows:*

Absolute Pressure	Metres	Feet
700 hPa	*3000*	*10000*
620 hPa	*4000*	*13000*
376 hPa	*7600*	*25000*

7.1 An aeroplane intended to be operated at flight altitudes at which the atmospheric pressure is less than 700 hPa in personnel compartments shall be equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in 7.1.1 of Chapter 2.

7.2 An aeroplane intended to be operated at flight altitudes at which the atmospheric pressure is less than 700 hPa but which is provided with means of maintaining pressures greater than 700 hPa in personnel compartments shall be provided with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in 7.1.2 of Chapter 2.

7.3 Pressurized aeroplanes newly introduced into service on or after 1 July 1962 and intended to be operated at flight altitudes at which the atmospheric pressure is less than 376 hPa shall be equipped with a device to provide positive warning to the flight crew of any dangerous loss of pressurization.

7.4 An aeroplane intended to be operated at flight altitudes at which the atmospheric pressure is less than 376 hPa, or which, if operated at flight altitudes at which the atmospheric pressure is more than 376 hPa, cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to 620 hPa and for which the individual certificate of airworthiness is first issued on or after 9 November 1998, shall be provided with automatically deployable oxygen equipment to satisfy the requirements of 7.1.2 of Chapter 2. The total number of oxygen dispensing units shall exceed the number of passenger and cabin crew seats by at least 10 percent

8 ALL AEROPLANES IN ICING CONDITIONS

All aeroplanes shall be equipped with suitable de-icing and/or anti-icing devices when operated in circumstances in which icing conditions are reported to exist or are expected to be encountered.

9 ALL AEROPLANES OPERATED IN ACCORDANCE WITH INSTRUMENT FLIGHT RULES

9.1 All aeroplanes when operated in accordance with the instrument flight rules, or when the aeroplane cannot be maintained in a desired attitude without reference to one or more flight instruments, shall be equipped with:

(a) A magnetic compass;

(b) An accurate timepiece indicating the time in hours, minutes and seconds;

(c) Two sensitive pressure altimeters with counter drum-pointer or equivalent presentation;

Note: *Neither three-pointer nor drum-pointer altimeters satisfy the requirement in 9.1 c) of this chapter.*

(d) An airspeed indicating system with means of preventing malfunctioning due to either condensation or icing;

(e) A turn and slip indicator;

(f) An attitude indicator (artificial horizon);

(g) A heading indicator (directional gyroscope);

Note: *The requirements of 9.1 (e), (f) and (g) may be met by combinations of instruments or by integrated flight director systems provided that the safeguards against total failure, inherent in the three separate instruments, are retained.*

(h) A means of indicating whether the power supply to the gyroscopic instrument is adequate;

(i) A means of indicating in the flight crew compartment the outside air temperature;

(j) A rate-of-climb and descent indicator; and

(k) Such additional instruments or equipment as may be prescribed by the authority.

9.2 All aeroplanes over 5700 kg – Emergency power supply for electrically operated attitude indicating instruments

9.2.1 All aeroplanes of a maximum certificated take-off mass of over 5700 kg newly introduced into service after 1 January 1975 shall be fitted with an emergency power supply, independent of the main electrical generating system, for the purpose of operating and illuminating, for a minimum period of 30 minutes, an attitude indicating instrument (artificial horizon), clearly visible to the Pilot-in-Command. The emergency power supply shall be automatically operative after the total failure of the main electrical

generating system and clear indication shall be given on the instrument panel that the attitude indicator(s) is being operated by emergency power.

9.2.2 Those instruments that are used by any one pilot shall be so arranged as to permit the pilot to see their indications readily from his or her station, with the minimum practicable deviation from the position and line of vision normally assumed when looking forward along the flight path.

10 ALL AEROPLANES WHEN OPERATED AT NIGHT

All aeroplanes when operated at night shall be equipped with:

(a) All equipment specified in 9 of this chapter;

(b) The lights required by regulation of civil aviation board no. 94 on rules of the air for aircraft in flight or operating on the movement area of an aerodrome;

Note: *Specifications for lights meeting the requirements of Regulation of Civil Aviation Board No. 94 on Rules of the Air for navigation lights are contained in Appendix U. The general characteristics of lights are specified in Annex 8.*

(c) Two landing lights;

Note: *Aeroplanes not certificated in accordance with Annex 8 which are equipped with a single landing light having two separately energized filaments will be considered to have complied with 10 (c) of this chapter.*

(d) Illumination for all instruments and equipment that are essential for the safe operation of the aeroplane that are used by the flight crew;

(e) Lights in all passenger compartments; and

(f) An independent portable light for each crew member station.

11 PRESSURIZED AEROPLANES WHEN CARRYING PASSENGERS – WEATHER RADAR

Pressurized aeroplanes when carrying passengers shall be equipped with operative weather radar whenever such aeroplanes are being operated in areas where thunderstorms or other potentially hazardous weather conditions, regarded as detectable with airborne weather radar, may be expected to exist along the route either at night or under instrument meteorological conditions.

12 ALL AEROPLANES OPERATED ABOVE 15 000 M (49 000 FT) – RADIATION INDICATOR

All aeroplanes intended to be operated above 15 000 m (49 000 ft) shall carry equipment to measure and indicate continuously the dose rate of total cosmic radiation being received (i.e. the total of ionizing and neutron radiation of galactic and solar origin) and the cumulative dose on each flight. The display unit of the equipment shall be readily visible to a flight crew member.

13 ALL AEROPLANES COMPLYING WITH THE NOISE CERTIFICATION STANDARDS IN THE NOTIFICATION OF CAAT ON NOISE CERTIFICATION

An aeroplane shall carry a document attesting noise certification. When the document, or a suitable statement attesting noise certification as contained in another document approved by the Authority, is issued in a language other than English, it shall include an English translation.

Note: *The attestation may be contained in any document, carried on board, approved by the Authority.*

14 MACH NUMBER INDICATOR

All aeroplanes with speed limitations expressed in terms of Mach number shall be equipped with a Mach number indicator.

Note: *This does not preclude the use of the airspeed indicator to derive Mach number for ATS purposes.*

15 AEROPLANES REQUIRED TO BE EQUIPPED WITH GROUND PROXIMITY WARNING SYSTEMS (GPWS)

15.1 All turbine-engine aeroplanes of a maximum certificated take-off mass in excess of 5700 kg or authorized to carry more than nine passengers shall be equipped with a ground proximity warning system which has a forward-looking terrain avoidance function.

15.2 The operator shall implement database management procedures that ensure the timely distribution and update of current terrain and obstacle data to the ground proximity warning system.

15.3 All turbine-engined aeroplanes of a maximum certificated take-off mass of 5 700 kg or less and authorized to carry more than five but not more than nine passengers for which the individual certificate of airworthiness is first issued on or after 1 January 2026, shall be equipped with a ground proximity warning system which provides the warnings of 15.6 a) and c), warning of unsafe terrain clearance and a forward-looking terrain avoidance function.

15.4 All piston-engine aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than nine passengers shall be equipped with a ground proximity warning system which provides the warnings in 15.6 (a) and (c), warning of unsafe terrain clearance and a forward-looking terrain avoidance function.

15.5 A ground proximity warning system shall provide automatically a timely and distinctive warning to the flight crew when the aeroplane is in potentially hazardous proximity to the earth's surface.

15.6 A ground proximity warning system shall provide, unless otherwise specified herein, warnings of the following circumstances:

(a) Excessive descent rate;

(b) Excessive terrain closure rate;

(c) Excessive altitude loss after take-off or go-around;

(d) Unsafe terrain clearance while not in landing configuration:

(i) Gear not locked down;

(ii) Flaps not in a landing position; and

(e) Excessive descent below the instrument glide path.

16 AEROPLANES CARRYING PASSENGERS – CABIN CREW SEATS

16.1 Aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 January 1981

All aeroplanes shall be equipped with a forward or rearward facing (within 15 degrees of the longitudinal axis of the aeroplane) seat, fitted with a safety harness for the use of each cabin crew member required to satisfy the intent of 1.3 of Chapter 7 in respect of emergency evacuation.

Note: *Safety harness includes shoulder straps and a seat belt which may be used independently.*

16.2 Cabin crew seats provided in accordance with 16.1 and 16.2 shall be located near floor level and other emergency exits as required by the Authority for emergency evacuation.

17 EMERGENCY LOCATOR TRANSMITTER (ELT)

17.1 Except as provided for in 17.2, all aeroplanes authorized to carry more than 19 passengers shall be equipped with at least one automatic ELT or two ELTs of any type.

17.2 All aeroplanes authorized to carry more than 19 passengers for which the individual certificate of airworthiness is first issued after 1 July 2008 shall be equipped with either:

(a) At least two ELTs, one of which shall be automatic; or

(b) At least one ELT and a capability that meets the requirements of 18 of this chapter.

17.3 Except as provided for in 17.4, all aeroplanes authorized to carry 19 passengers or less shall be equipped with at least one ELT of any type.

17.4 All aeroplanes authorized to carry 19 passengers or less for which the individual certificate of airworthiness is first issued after 1 July 2008 shall be equipped with at least one automatic ELT.

17.5 All aeroplane shall carry an emergency locator transmitter (ELT) that operated simultaneously on 406 MHz and 121.5 MHz.

17.6 ELT equipment carried to satisfy the requirements of 17.1, 17.2, 17.3, 17.4 and 17.5 shall operate in accordance with the relevant provisions of Annex 10, Volume III to the Convention on International Civil Aviation.

17.7 ELT that is capable of transmitting on 406 MHz shall be registered and coded in accordance with the relevant provisions of Annex 10, Volume III to the Convention on International Civil Aviation.

Note: *The judicious choice of numbers of ELTs, their type and placement on aircraft and associated floatable life support systems will ensure the greatest chance of ELT activation in the event of an accident for aircraft operating over water or land, including areas especially difficult for search and rescue. Placement of transmitter units is a vital factor in ensuring optimal crash and fire protection. The placement of the control and switching devices (activation monitors) of automatic fixed ELTs and their associated operational procedures will also take into consideration the need for rapid detection of inadvertent activation and convenient manual switching by crew members.*

18 LOCATION OF AN AEROPLANE IN DISTRESS

18.1 As of 1 January 2025, all aeroplanes of a maximum certificated take-off mass of over 27000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2024, shall autonomously transmit information from which a position can be determined by the operator at least once every minute, when in distress, in accordance with Appendix R.

18.2 The operator shall make position information of a flight in distress available to the appropriate search and rescue center.

Note: *Refer to 10.2 of Chapter 1 for operator responsibilities when using third parties.*

18.3 The operator shall ensure that the Location of an Aircraft in Distress Repository (LADR) is automatically updated with position information from an aircraft in a distress condition.

Note1: *Guidance on the format and means to update the information in the LADR is contained in the Functional Specifications for the Location of an Aircraft in Distress Repository (LADR) (Doc 10150).*

Note2: *An aircraft is considered to be in a distress condition when it is in a state that, if the aircraft behaviour event is left uncorrected, can result in an accident.*

18.4 The operator shall ensure that they have established and documented:

(a) a training programme for flight operations officers/flight dispatchers, or other personnel nominated by the operator for the control and supervision of flights, on the use of the autonomous distress tracking (ADT) services and functionalities;

(b) procedures for the monitoring of information received from the ADT system, including actions to be taken in the event of a notification of a distress condition; and

(c) policy and procedures for the flight crew manual activation function.

Note1: *Further information for autonomous distress tracking can be found in the Manual on Location of Aircraft in Distress and Flight Recorder Data Recovery (Doc 10054).*

Note2: *For more information on distress conditions, see the Manual on Location of Aircraft in Distress and Flight Recorder Data Recovery (Doc 10054).*

19 AEROPLANES REQUIRED TO BE EQUIPPED WITH AN AIRBORNE COLLISION AVOIDANCE SYSTEM (ACAS II)

19.1 All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than 19 passengers shall be equipped with an airborne collision avoidance system (ACAS II).

19.2 The ACAS II shall operate in accordance with the relevant provisions of Annex 10, Volume IV.

19.3 ACAS X and the Traffic Alert and Collision Avoidance Systems (TCAS) Version 7.1 are considered as ACAS II systems.

20 REQUIREMENTS FOR PRESSURE-ALTITUDE REPORTING TRANSPONDERS

20.1 All aeroplanes shall be equipped with a pressure-altitude reporting transponder which operates in accordance with the relevant provisions of Annex 10, Volume IV to the Convention on International Civil Aviation.

20.2 All aeroplanes for which the individual certificate of airworthiness is first issued after 1 January 2009 shall be equipped with a data source that provides pressure-altitude information with a resolution of 7.62 m (25 ft), or better.

20.3 All aeroplanes shall be equipped with a data source that provides pressure-altitude information with a resolution of 7.62 m (25 ft), or better.

Note 1: *These provisions will improve the effectiveness of airborne collision avoidance systems as well as air traffic services that employ Mode S radar. In particular, tracking processes are significantly enhanced with a resolution of 7.62 m (25 ft), or better.*

Note 2: *Mode C replies of transponders always report pressure altitude in 30.50 m (100 ft) increments irrespective of the resolution of the data source.*

21 MICROPHONES

All flight crew members required to be on flight deck duty shall communicate through boom or throat microphones below the transition level/altitude.

22 TURBO-JET AEROPLANES – FORWARD-LOOKING WIND SHEAR WARNING SYSTEM

22.1 All turbo-jet aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than nine passengers shall be equipped with a forward-looking wind shear warning system.

23 ALL AEROPLANES OPERATED BY A SINGLE PILOT UNDER THE INSTRUMENT FLIGHT RULES (IFR) OR AT NIGHT

For approval in accordance with 2.4 of Chapter 2, all aeroplanes operated by a single pilot under the IFR or at night shall be equipped with:

(a) A serviceable autopilot that has at least altitude hold and heading select modes;

(b) A headset with a boom microphone or equivalent; and

(c) Means of displaying charts that enables them to be readable in all ambient light conditions.

24 AEROPLANES EQUIPPED WITH AUTOMATIC LANDING SYSTEMS, A HEAD-UP DISPLAY (HUD) OR EQUIVALENT DISPLAYS, ENHANCED VISION SYSTEMS (EVS), SYNTHETIC VISION SYSTEMS (SVS) AND/OR COMBINED VISION SYSTEMS (CVS)

24.1 Notwithstanding Chapter 2 item 13.2 where aeroplanes are equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, or any combination of those systems into a hybrid system, the use of such systems, criteria for the safe operation of an aeroplane shall be approved by the Authority.

Note: *Information regarding, automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, is contained in the Manual of All-Weather Operations (ICAO Doc 9365).*

25 ELECTRONIC FLIGHT BAGS (EFBS)

Note: *Guidance on EFB equipment, functions and specific approval is contained in the Manual on Electronic Flight Bags (EFBs) (ICAO Doc 10020) and CAAT EFB guidance material.*

25.1 EFB equipment

Where portable EFBs are used on board an aeroplane, the operator shall ensure that they do not affect the performance of the aeroplane systems, equipment or the ability to operate the aeroplane.

25.2 EFB functions

25.2.1 Where EFBs are used on board an aeroplane the operator shall:

(a) Assess the safety risk(s) associated with each EFB function;

(b) Establish and document the procedures for the use of, and training requirements for, the device and each EFB function; and

(c) Ensure that, in the event of an EFB failure, sufficient information is readily available to the flight crew for the flight to be conducted safely.

Note: *Guidance on safety risk assessments is contained in the Safety Management Manual (SMM) (ICAO Doc 9859).*

25.2.2 The operational use of EFB functions shall be authorized by the Authority under specific approval to be used for the safe operation of aeroplanes.

25.3 EFB specific approval

To obtain a specific approval from the Authority, the operator shall provide evidence that:

(a) The EFB equipment and its associated installation hardware, including interaction with aeroplane systems if applicable, meet the appropriate airworthiness certification requirements;

(b) The operator has assessed the safety risks associated with the operations supported by the EFB function(s);

(c) The operator has established requirements for redundancy of the information (if appropriate) contained in and displayed by the EFB function(s);

(d) The operator has established and documented procedures for the management of the EFB function(s) including any database it may use; and

(e) The operator has established and documented the procedures for the use of, and training requirements for, the EFB and the EFB function(s).

Note: *Guidance on safety risk assessments is contained in the Safety Management Manual (SMM) (ICAO Doc 9859).*

26 TURBINE AEROPLANE - RUNWAY OVERRUN AWARENESS AND ALERTING SYSTEM (ROAAS)

26.1 All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg, for which the individual certificate of airworthiness is first issued on or after 1 January 2026, shall be equipped with a runway overrun awareness and alerting system (ROAAS).

Note: Guidance material for ROAAS design is contained in EUROCAE ED-250, Minimum Operation Performance Specification (MOPS) for Runway Overrun Awareness and Alerting System (ROAAS), or equivalent documents.

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CHAPTER 11

AEROPLANE COMMUNICATION, NAVIGATION AND SURVEILLANCE EQUIPMENT

Note:- *This chapter will apply for only operator of aeroplane, for operator of helicopter will comply with Helicopter Operations Requirements*

1 COMMUNICATION EQUIPMENT

1.1 An aeroplane shall be provided with radio communication equipment capable of:

(a) Conducting two-way communication for aerodrome control purposes;

(b) Receiving meteorological information at any time during flight; and

(c) Conducting two-way communication at any time during flight with at least one aeronautical station and with such other aeronautical stations and on such frequencies as may be prescribed by the appropriate authority.

Note:- *The requirements of 1.1 of this chapter, are considered fulfilled if the ability to conduct the communications specified therein is established during radio propagation conditions which are normal for the route.*

1.2 The radio communication equipment required in accordance with 1.1 of this chapter shall provide for communications on the aeronautical emergency frequency 121.5 MHz.

1.3 For operations where communication equipment is required to meet an RCP specification for performance-based communication (PBC), an aeroplane shall, in addition to the requirements specified in 1.1 of this chapter:

(a) Be provided with communication equipment which will enable it to operate in accordance with the prescribed RCP specification(s);

(b) Have information relevant to the aeroplane RCP specification capabilities listed in the flight manual or other aeroplane documentation approved by the State of Design or the Authority; and

(c) Have information relevant to the aeroplane RCP specification capabilities included in the MEL.

Note:- *Information on the performance-based communication and surveillance (PBCS) concept and guidance material on its implementation are contained in the Performance-based Communication and Surveillance (PBCS) Manual (ICAO Doc 9869) and CAAT Guidance Material for PBCS Operational Approval.*

1.4 For operations where an RCP specification for PBC has been prescribed, the operator shall establish and document:

(a) Normal and abnormal procedures, including contingency procedures;

(b) Flight crew qualification and proficiency requirements, in accordance with appropriate RCP specifications;

(c) A training programme for relevant personnel consistent with the intended operations; and

(d) Appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RCP specifications.

1.5 In respect of those aeroplanes mentioned in 1.3 of this chapter, the operator shall ensure adequate provisions exist for:

(a) Receiving the reports of observed communication performance issued by monitoring programmes established in accordance with Annex 11, Chapter 3, 3.3.5.2 to the Convention on International Civil Aviation; and

(b) Reporting problems, identified either by the flight crew or other personnel, to the Authority and appropriate PBCS monitoring entities associated with the route of flight on which the problem occurred; and

(c) Disclosing operational data in a timely manner to the Authority and/or appropriate PBCS monitoring entities when requested for the purposed of investigating a reported problem;

(d) Participating in the investigation and resolving the cause of the deficiencies reported by the PBCS monitoring entities;

(e) Taking immediate corrective action for individual aircraft, aircraft types or operators, identified in such reports as not complying with the RCP specification(s).

(f) Providing the Authority corrective action on the non-compliance with the RCP specification issued by the Authority or relevant PBCS monitoring entity within a predetermined timeframe.

2 NAVIGATION EQUIPMENT

2.1 An aeroplane shall be provided with navigation equipment which will enable it to proceed:

(a) In accordance with its operational flight plan; and

(b) In accordance with the requirements of air traffic services;

except when, if not so precluded by the appropriate authority, navigation for flights under VFR is accomplished by visual reference to landmarks.

2.2 For operations where a navigation specification for performance-based navigation (PBN) has been prescribed, an aeroplane shall, in addition to the requirements specified in 2.1 of this chapter:

(a) Be provided with navigation equipment which will enable it to operate in accordance with the prescribed navigation specification(s);

(b) Have information relevant to the aeroplane navigation specification capabilities listed in the flight manual or other aeroplane documentation approved by the state of the design or the authority; and

(c) Have information relevant to the aeroplane navigation specification capabilities included in the MEL.

Note:- *Guidance on aeroplane documentation is contained in CAAT Performanced-Based Navigation (PBN) guidance material and the Performance-based Navigation (PBN) Manual (ICAO Doc 9613) and CAAT Performanced-Based Navigation (PBN) guidance material.*

2.3 For operations where a navigation specification for PBN has been prescribed, the operator shall establish and document:

(a) Normal and abnormal procedures including contingency procedures;

(b) Flight crew qualification and proficiency requirements in accordance with the appropriate navigation specifications;

(c) A training programme for relevant personnel consistent with the intended operations; and

(d) Appropriate maintenance procedures to ensure continued airworthiness in accordance with the appropriate navigation specifications.

Note 1:- *Guidance on safety risks and mitigations for PBN operations, in accordance with Annex 19, are contained in the Performance-based Navigation (PBN) Operational Approval Manual (ICAO Doc 9997) and CAAT Performanced-Based Navigation (PBN) guidance material.*

Note 2:- *Electronic navigation data management is an integral part of normal and abnormal procedures.*

2.4 PBN operations shall be authorized by the Authority under specific approval based on PBN Authorization Required (AR) navigation specifications.

Note:- *Guidance on specific approvals for PBN authorization required (AR) navigation specifications is contained in the Performance-based Navigation (PBN) Operational Approval Manual (ICAO Doc 9997) and CAAT Performanced-Based Navigation (PBN) guidance material.*

2.5 For flights in defined portions of airspace where, based on Regional Air Navigation Agreement, Minimum Navigation Performance Specifications (MNPS) are prescribed, an aeroplane shall be provided with navigation equipment which:

(a) Continuously provides indications to the flight crew of adherence to or departure from track to the required degree of accuracy at any point along that track; and

(b) Has been authorized by the Authority under specific approval for the MNPS operations concerned.

Note:- *The prescribed minimum navigation performance specifications and the procedures governing their application are published in the Regional Supplementary Procedures (ICAO Doc 7030).*

2.6 For flights in defined portions of airspace where, based on Regional Air Navigation Agreement, a Reduced Vertical Separation Minimum (RVSM) of 300 m (1 000 ft) is applied between FL 290 and FL 410 inclusive:

(a) The aeroplane shall be provided with equipment which is capable of:

(i) Indicating to the flight crew the flight level being flown;

(ii) Automatically maintaining a selected flight level;

(iii) Providing an alert to the flight crew when a deviation occurs from the selected flight level. The threshold for the alert shall not exceed ± 90 m (300 ft); and

(iv) Automatically reporting pressure-altitude; and

(b) Has been authorized by the Authority under specific approval for RVSM Operations.

2.7 Prior to granting the RVSM specific approval required in accordance with 2.6 (b) of this chapter, the operator shall:

(a) Ensure that the vertical navigation performance capability of the aeroplane satisfies the requirements specified in Chapter 2, paragraph 24.4 in this document;

(b) Institute appropriate procedures in respect of continued airworthiness (maintenance and repair) practices and programmes; and

(c) Institute appropriate flight crew procedures for operations in RVSM airspace.

Note:- *An RVSM specific approval is valid globally on the understanding that any operating procedures specific to a given region will be stated in the operations manual or appropriate crew guidance.*

2.8 In respect of those aeroplanes mentioned in 2.6 of this chapter, the operator shall ensure adequate provisions exist for:

(a) Receiving the reports of height-keeping performance issued by the monitoring agencies established in accordance with Annex 11, 3.3.5.1 to the Convention on International Civil Aviation; and

(b) Taking immediate corrective action for individual aircraft, or aircraft type groups, identified in such reports as not complying with the height-keeping requirements for operation in airspace where RVSM is applied.

2.9 The operator that obtain an RVSM specific approval, shall ensure that a minimum of two aeroplanes of each aircraft type grouping of the operator have their height-keeping performance monitored, at least once every two years or within intervals of 1 000 flight hours per aeroplane, whichever period is longer. If the operator aircraft type grouping consists of a single aeroplane, monitoring of that aeroplane shall be accomplished within the specified period.

Note:- *Monitoring data from any regional monitoring programme established in accordance with Annex 11, 3.3.5.2 to the Convention on International Civil Aviation, may be used to satisfy the requirement.*

2.10 The operator shall establish provisions and procedures which ensure that appropriate action will be taken in respect of aircraft found to be operating in RVSM airspace without a valid RVSM specific approval.

Note 1:- *These provisions and procedures need to address both the situation where the aircraft in question is operating without a specific approval in the airspace of the State, and the situation where the operator for which the State has regulatory oversight responsibility is found to be operating without the required specific approval in the airspace of another State.*

Note 2:- *Guidance material relating to the specific approval for operation in RVSM airspace is contained in the Manual on a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (ICAO Doc 9574) and CAAT Guidance Material for Reduced Vertical Separation Minimum (RVSM).*

2.11 The aeroplane shall be sufficiently provided with navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the flight, the remaining equipment will enable the aeroplane to navigate in accordance with 2.1 of this chapter and, where applicable, 2.2, 2.5 and 2.6 of this chapter.

Note:- *Guidance material relating to aircraft equipment necessary for flight in airspace where RVSM is applied is contained in the Manual on a 300 m (1 000 ft) Vertical Separation Minimum Between FL 290 and FL 410 Inclusive (ICAO Doc 9574) and CAAT Guidance Material for Reduced Vertical Separation Minimum (RVSM).*

2.12 On flights in which it is intended to land in instrument meteorological conditions, an aeroplane shall be provided with radio equipment capable of receiving signals providing guidance to a point from which a visual landing can be effected. This equipment shall be

capable of providing such guidance for each aerodrome at which it is intended to land in instrument meteorological conditions and for any designated alternate aerodromes.

3 SURVEILLANCE EQUIPMENT

3.1 An aeroplane shall be provided with surveillance equipment which will enable it to operate in accordance with the requirements of air traffic services.

3.2 For operations where surveillance equipment is required to meet an RSP specification for performance-based surveillance (PBS), an aeroplane shall, in addition to the requirements specified in 3.1 of this chapter:

(a) Be provided with surveillance equipment which will enable it to operate in accordance with the prescribed RSP specification(s);

(b) Have information relevant to the aeroplane RSP specification capabilities listed in the flight manual or other aeroplane documentation approved by the State of Design or the Authority; and

(c) Have information relevant to the aeroplane RSP specification capabilities included in the MEL.

Note 1:- *Information on surveillance equipment is contained in the Aeronautical Surveillance Manual (ICAO Doc 9924).*

Note 2:- *Information on RSP specifications for performance-based surveillance is contained in the Performance-based Communication and Surveillance (PBCS) Manual (Doc 9869) and CAAT Guidance Material for PBCS Operational Approval.*

3.3 Of this chapter for operations where an RSP specification for PBS has been prescribed, the operator shall establish and document:

(a) Normal and abnormal procedures, including contingency procedures;

(b) Flight crew qualification and proficiency requirements, in accordance with appropriate RSP specifications;

(c) A training programme for relevant personnel consistent with the intended operations; and

(d) Appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RSP specifications.

3.4 In respect of those aeroplanes mentioned in 3.2 of this chapter, the operator shall ensure adequate provisions exist for:

(a) Receiving the reports of observed surveillance performance issued by monitoring programmes established in accordance with Annex 11, Chapter 3, 3.3.5.2 to the Convention on International Civil Aviation; and

(b) Taking immediate corrective action for individual aircraft, aircraft types or operators, identified in such reports as not complying with the RSP specification(s).

4 INSTALLATION

The equipment installation shall be such that the failure of any single unit required for communication, navigation or surveillance purposes or any combination thereof will not result in the failure of another unit required for communication, navigation or surveillance purposes.

5 ELECTRONIC NAVIGATION DATA MANAGEMENT

5.1 The operator shall not employ electronic navigation data products that have been processed for application in the air and on the ground unless the Authority has approved the operator's procedures for ensuring that the process applied and the products delivered have met acceptable standards of integrity and that the products are compatible with the intended function of the existing equipment. The operator shall continue to monitor both the process and products.

Note:- *Guidance relating to the processes that data suppliers may follow is contained in RTCA DO-200A/EUROCAE ED-76 and RTCA DO-201A/EUROCAE ED-77.*

5.2 The operator shall implement procedures that ensure the timely distribution and insertion of current and unaltered electronic navigation data to all necessary aircraft.

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CHAPTER 12

AEROPLANE CONTINUING AIRWORTHINESS

Note 1:- *This chapter will apply for only operator of aeroplane, For operator of helicopter will comply with Helicopter Operations Requirements*

Note 2:- *For the purpose of this chapter, "aeroplane" includes: engines, propellers, components, accessories, instruments, equipment and apparatus including emergency equipment.*

Note 3:- *Maintenance Organization, also named Repair Station*

1 OPERATOR'S CONTINUING AIRWORTHINESS RESPONSIBILITIES

1.1 Operators shall ensure that, in accordance with procedures acceptable to the Authority:

(a) Each aeroplane they operate is maintained in an airworthy condition;

(b) The operational and emergency equipment necessary for an intended flight is serviceable; and

(c) The certificate of airworthiness of each aeroplane they operate remains valid.

1.2 The operator shall not operate an aeroplane unless maintenance on the aeroplane, including any associated engine, propeller and part, is carried out:

(a) By an organization approved by the Authority or is approved by another Contracting State and is accepted by the Authority; or

(b) By a person or organization in accordance with procedures that are specified in the general maintenance manual.

and there is a maintenance release in relation to the maintenance carried out.

(c) For any engine, propeller or part the maintenance release certificate shall be a CAAT form 1 or equivalent.

1.3 The operator shall employ a person or group of persons to ensure that all maintenance is carried out in accordance with the general maintenance manual.

1.4 The operator shall ensure that the maintenance of its aeroplanes is performed in accordance with the maintenance programme approved by the Authority.

2 GENERAL MAINTENANCE MANUAL

2.1 The operator shall provide, for the use and guidance of maintenance and operational personnel concerned, a general maintenance manual (GMM), approved by the Authority, in accordance with the requirements in Chapter 13, paragraph 2 of this document. The design of the manual shall observe Human Factors principles (See Appendix AB for guidelines).

Note:- *More Gguidanceuidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (ICAO Doc 9683).*

2.2 The operator shall ensure that the general maintenance manual is amended as necessary to keep the information contained therein up to date.

2.3 Copies of all amendments to the general maintenance manual shall be furnished promptly to all organizations or persons to whom the manual has been issued.

2.4 The operator shall provide the Authority with a copy of the general maintenance manual and related procedures referred in it, together with all amendments and/or revisions to it and shall incorporate in it such mandatory material as the Authority may require.

3 MAINTENANCE PROGRAMME

3.1 The operator shall provide, for the use and guidance of maintenance and operational personnel concerned, a maintenance programme (MP), approved by State of Registry, containing the information required by 3 of Chapter 13. The design and application of the maintenance programme shall observe Human Factors principles (See Appendix AB for guidelines)..

Note:- *Guidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (ICAO Doc 9683).*

3.2 Copies of all amendments to the maintenance programme shall be furnished promptly to all organizations or persons to whom the maintenance programme has been issued. If there are revisions, the operator shall furnish the details or revisions to the Authority. However, it is understood that compliance with the maintenance programme alone does not discharge the operator from ensuring that the maintenance programme reflects the maintenance needs of the aircraft, such that continuing safe operation can be assured.

4 CONTINUING AIRWORTHINESS RECORDS

4.1 The operator shall ensure that the following records are kept for the periods mentioned in 4.2:

(a) The total time in service (hours, calendar time and cycles, as appropriate) of the aeroplane and all life-limited components;

(b) The current status of compliance with all mandatory continuing airworthiness information;

(c) Appropriate details of modifications and repairs;

(d) The time in service (hours, calendar time and cycles, as appropriate) since the last overhaul of the aeroplane or its components subject to a mandatory overhaul life;

(e) The current status of the aeroplane’s compliance with the maintenance programme; and

(f) The detailed maintenance records to show that all requirements for the signing of a maintenance release have been met.

4.2 The records in 4.1 (a) to (e) shall be kept for a minimum period of 90 days after the unit to which they refer has been permanently withdrawn from service, and the records in 4.1 (f) for a minimum period of one year after the signing of the maintenance release.

4.3 In the event of a temporary change of operator, the records shall be made available to the new operator. In the event of any permanent change of operator, the records shall be transferred to the new operator.

4.4 The operator shall ensure that records kept and transferred in accordance with 4.4 shall be maintained in a form and format that ensures readability, security and integrity of the records at all times.

Note:- *The form and format of the records may include, for example, paper records, film records, electronic records or any combination thereof.*

5 CONTINUING AIRWORTHINESS INFORMATION

5.1 The operator shall report information on the occurrences of faults, malfunctions, defects or other occurrences that cause or might cause adverse effects on the continuing airworthiness of the aircraft concerning but not limited to the occurrence or detection of each failure, malfunction, or defect contained in CAAT Requirement No.22 on “Occurrence Reporting in Civil Aviation”.

5.2 In addition to the requirements contained in 5.1 of this chapter, the operator of an aeroplane over 5700 kg maximum certificated take-off mass, shall monitor and assess maintenance and operational experience with respect to continuing airworthiness and report information as detailed in 5.1 of this chapter to the following persons:

(a) The aircraft type certificate holder; or

(b) In the case where information on faults, malfunctions, defects and other occurrences relates to an engine or propeller, the aircraft type certificate holder and the organisation responsible for the engine or propeller design; or

(c) In the case of an occurrence associated with a modification, the organization responsible for the design of the modification.

5.3 Such information as detailed in para 5.1 and 5.2 may be transmitted by any method i.e. electronically (email: safetyreport@caat.or.th), by post or by facsimile. Each report shall contain at least the following information in accordance with CAAT Requirement No.22 on “Occurrence Reporting in Civil Aviation”.

5.4 The operator of an aeroplane over 5700 kg maximum certificated take-off mass, shall ensure that obtain and assess continuing airworthiness information and recommendations available from the organization responsible for the type design and shall implement resulting actions considered necessary in accordance with a procedure acceptable to the Authority.

6 MODIFICATIONS AND REPAIRS

All modifications and repairs shall comply with the requirements contained in CAAT Modification and Repair Approval Requirement.

7 MAINTENANCE RELEASE

7.1 When maintenance is carried out by an approved maintenance organization, the maintenance release shall be issued by the approved maintenance organization in accordance with the provisions of CAAT Repair Station Certificate Requirement.

7.2 When maintenance is not carried out by an approved maintenance organization, the maintenance release shall be completed and signed by a person appropriately licensed in accordance with the CAAT regulation to certify that the maintenance work performed has been completed satisfactorily and in accordance with approved data and procedures described in the general maintenance manual.

7.3 A maintenance release shall contain at least a certification including:

(a) Basic details of the maintenance carried out including detailed reference of the approved data used;

(b) The date such maintenance was completed; and

(c) When applicable, the identity of the approved maintenance organization; and

(d) The identity of the person or persons signing the release.

CHAPTER 13

MANUALS, LOGS AND RECORDS

Note 1:- *This chapter will apply for only operator of aeroplane, For operator of helicopter will comply with Helicopter Operations Requirements*

Note 2:- *Maintenance Organization, also named Repair Station*

1 FLIGHT MANUAL

The flight manual shall be updated by implementing changes made mandatory by the Authority.

2 GENERAL MAINTENANCE MANUAL (GMM)

The GMM provided in accordance with Chapter 12, paragraph 2 which may be issued in separate parts, shall contain at least the following information:

(a) A description of the procedures required by Chapter 12, paragraph 1.2 including, when applicable:

1) A description of the administrative arrangements between the operator and the approved maintenance organization;
2) A description of the maintenance procedures and the procedures for completing and signing a maintenance release when maintenance is based on a system other than that of an approved maintenance organization.

(b) Names and duties of the person or persons required by 1.3 of Chapter 12;

(c) A reference to the maintenance programme required by 3.1 of Chapter 12;

(d) A description of the methods used for the completion and retention of the operator's continuing airworthiness records required by 4 of Chapter 12;

(e) A description of the procedures for monitoring, assessing and reporting maintenance and operational experience required by 5.2 of Chapter 12;

(f) A description of the procedures for complying with the service information reporting as required by required by 5 of Chapter 12;

(g) A description of procedures for assessing continuing airworthiness information and implementing any resulting actions, as required by 5.4 of Chapter 12;

(h) A description of the procedures for implementing action resulting from mandatory continuing airworthiness information;

(i) A description of establishing and maintaining a system of analysis and continued monitoring of the performance and efficiency of the maintenance programme, in order to correct any deficiency in that programme;

(j) A description of aircraft types and models to which the manual applies;

(k) A description of procedures for ensuring that unserviceability's affecting airworthiness are recorded and rectified; and

(l) A description of the procedures for advising significant in-service occurrences.

(m) A description of procedures to control the leasing of aircraft and related aeronautical products; and

(n) A description of the GMM amendment procedures; and

(o) Other information prescribed by the Authority.

Note:- *Detail of other information prescribed by the Authority as 2 (m) of this chapter, is given in CAAT Announcement subject Requirement of General Maintenance Manual and CAAT Guidance Material for General Maintenance Manual.*

3 MAINTENANCE PROGRAMME

3.1 A maintenance programme for each aeroplane as required by 3 of Chapter 12 shall contain at least the following information:

(a) Maintenance tasks and the intervals at which these are to be performed, taking into account the anticipated utilization of the aeroplane;

(b) When applicable, a continuing structural integrity programme;

(c) Procedures for changing or deviating from (a) and (b) above; and

(d) When applicable, condition monitoring and reliability programme descriptions for aircraft systems, components and engines.

(e) Other information prescribed by the authority.

Note:- *Detail of other information prescribed by the Authority as 3.1 (e) of this chapter, is given in CAAT Announcement subject Aircraft Maintenance Programme of AOC Holder, CAAT Guidance Material for Aircraft Maintenance Schedules and Programmes and CAAT Guidance Material for Condition Monitored Maintenance.*

3.2 Maintenance tasks and intervals that have been specified as mandatory in approval of the type design shall be identified as such.

3.3 The maintenance programme shall be based on current maintenance programme information made available by the State of Design or by the organization responsible for the type design, and any additional applicable experience.

4 RECORDS OF EMERGENCY AND SURVIVAL EQUIPMENT CARRIED

Operators shall at all times have available for immediate communication to rescue coordination centres, lists containing information on the emergency and survival equipment carried on board any of their aeroplanes engaged in international air navigation. The information shall include, as applicable, the number, colour and type of life rafts and pyrotechnics, details of emergency medical supplies, water supplies and the type and frequencies of the emergency portable radio equipment.

5 FLIGHT RECORDER RECORDS

The operator shall ensure, to the extent possible, in the event the aeroplane becomes involved in an accident or incident, the preservation of all related flight recorder records and, if necessary, the associated flight recorders, and their retention in safe custody pending their disposition as determined by the investigation authority and in accordance with the ICAO standards.

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APPENDIX A

FORMAT OF THE AIR OPERATOR CERTIFICATE AND OPERATIONS SPECIFICATIONS, AOC APPLICATION AND ASSOCIATED FORMS

1 TYPES OF APPLICATION FOR AIR OPERATOR CERTIFICATE

There are three types of Air Operator Certificate (AOC) application:

(a) Initial Issue of an Air Operator Certificate

(b) Renewal of an Air Operator Certificate

(c) Variation of Existing Air Operator Certificate

(a) Initial Issue of an Air Operator Certificate (AOC) Application Form

According to Chapter 1 of this document, an AOC application shall be completed and submitted in the form approved by the Civil Aviation Authority of Thailand (CAAT). The following forms are the approved forms for applying for an AOC:

Note: The Initial Issue of an Air Operator Certificate applications are available at CAAT website: https://www.caat.or.th/th/archives/56751

Applications Code	Applications Name
CAAT-OPS-AOCFM-101	Application for Air Operator Certificate
CAAT-OPS-AOCFM-102	Application for Operations Specification
CAAT-OPS-AOCFM-103	Organization and Contents of an Operations Manual
CAAT-OPS-AOCFM-104	Operations Manual Critical Element
CAAT-OPS-AOCFM-105	Flight Safety Document System
CAAT-OPS-AOCFM-106	Application for Nomination for Air Operator Personnel Form
CAAT-OPS-AOCFM-107	Schedule of Event Form (SOE)
CAAT-OPS-SOC-101	Statement of Compliance Ch.1
CAAT-OPS-SOC-102	Statement of Compliance Ch. 2
CAAT-OPS-SOC-103	Statement of Compliance Ch. 3
CAAT-OPS-SOC-104	Statement of Compliance Ch. 4

Applications Code	Applications Name
CAAT-OPS-SOC-105	Statement of Compliance Ch. 5
CAAT-OPS-SOC-106	Statement of Compliance Ch. 6
CAAT-OPS-SOC-107	Statement of Compliance Ch. 7
CAAT-OPS-SOC-108	Statement of Compliance Ch. 8
CAAT-OPS-SOC-109	Statement of Compliance Ch.9
CAAT-OPS-SOC-110	Statement of Compliance Ch.10
CAAT-OPS-SOC-111	Statement of Compliance Ch.11
CAAT-OPS-SOC-112	Statement of Compliance Ch.12
CAAT-OPS-SOC-113	Statement of Compliance Ch.13
CAAT-OPS-SOC-151	Statement of Compliance Ch.13
CAAT-OPS-DG-401	Application for Approval of Dangerous Goods Training Program (if applicable)

(b) Renewal of an Air Operator Certificate (AOC) Application Form

Reserved.

(c) Variation of an Air Operator Certificate (AOC) Application Form

An AOC application shall be completed and submitted in the form, Application Form updates as appropriate to reflect the requested change(s);

Note: The variation to existing AOC applications are available at CAAT website: https://www.caat.or.th/th/archives/55724

Applications Code	Applications Name
CAAT-OPS-AOCFM-201	Application for Variation to an Air Operator Certificate
CAAT-OPS-AOCFM-101	Application for Air Operator Certificate
CAAT-OPS-AOCFM-102	Application for Operations Specification
CAAT-OPS-AOCFM-106	Application for Nomination for Air Operator Personnel Form

Applications Code	Applications Name
CAAT-OPS-AOCFM-107	Schedule of Event Form (SOE)
CAAT-OPS-SOC-101	Statement of Compliance Ch.1
CAAT-OPS-SOC-102	Statement of Compliance Ch. 2
CAAT-OPS-SOC-103	Statement of Compliance Ch. 3
CAAT-OPS-SOC-104	Statement of Compliance Ch. 4
CAAT-OPS-SOC-105	Statement of Compliance Ch. 5
CAAT-OPS-SOC-106	Statement of Compliance Ch. 6
CAAT-OPS-SOC-107	Statement of Compliance Ch. 7
CAAT-OPS-SOC-108	Statement of Compliance Ch. 8
CAAT-OPS-SOC-109	Statement of Compliance Ch.9
CAAT-OPS-SOC-110	Statement of Compliance Ch.10
CAAT-OPS-SOC-111	Statement of Compliance, Ch.11
CAAT-OPS-SOC-112	Statement of Compliance Ch.12
CAAT-OPS-SOC-113	Statement of Compliance Ch.13
CAAT-OPS-SOC-151	Statement of Compliance HEMS (if applicable)
CAAT-OPS-DG-401	Application for Approval of Dangerous Goods Training Program (if applicable)
CAAT-OPS-AOCFM-202	Application Form For PBCS (if applicable)
CAAT-OPS-AOCFM-205	Application and Checklist for FANS: CPDLC/ADS Approval (if applicable)
CAAT-OPS-AOCFM-206	Application & Self-Evaluation for ADS-B out/in Operational Approval (if applicable)

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2 FORMAT OF THE AIR OPERATOR CERTIFICATE AND OPERATIONS SPECIFICATIONS

2.1 Air Operator Certificate

Air Operator Certificate

Kingdom of Thailand

The Civil Aviation Authority of Thailand (CAAT)

AOC Number: XX/XXXX Expiry Date: DD Mmmm YYYY	Operator Name: XXXXX Trading Name: XXXXX Operator address: XXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX Telephone: (+66) 2XXX XXXX Fax: (+66) 2XXX XXXX Email: XXXXXXXX@XXXXXXXX	Operational points of contact: Contact details, at which operational management can be contacted without undue delay, are listed in Operations Manual Part A Chapter XXX

This certificate certifies that (Operator Name) is authorized to perform commercial air operations, as defined in the attached operations specifications, in accordance with operations manual, and the Air Navigation Act B.E. 2497 Article 15(6) and Article 21 Regulation on Civil Aviation Board (RCAB) No. 85, RCAB No. 86, and Air Operator Certificate Requirements (AOCR) and regulations and rule prescribed thereunder.

This certificate is not transferable and shall continue in effect unless returned, suspended or revoked.

Date of issue: DD Mmmm YYYY
Date of Revision: DD Mmmm YYYY
Rev.: XX

(.....)
Director General
The Civil Aviation Authority of Thailand

CAAT-OPS-AOCFM-152

Figure 1 Air Operator Certificate (AOC)

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Notes:

1. Unique AOC number, as issued by the Civil Aviation Authority of Thailand.
2. Date after which the AOC ceases to be valid (date-month-year).
3. The Operator's registered name
4. The Operator's trading name, if different from 3. Insert "dba" (for doing business as) before the trading name.
5. The operator's principal place of business's address.
6. The Operator's principal place of business telephone and fax details, including the country code and email address if available.
7. The details of the contact person or operational management position and the telephone and fax numbers including the country code, and email address (if available) at which operational management can be contacted without undue delay for issues related to flight operations, airworthiness, flight and cabin crew competency, dangerous goods and other matters, as appropriate. Alternately, it can refer to the controlled document carried on board, in which the contact details are listed, with the appropriate paragraph or page, e.g.: "Contact details are listed in the operations manual, Gen/Basic, Chapter 1, 1.1" or "…are listed in the operations specifications, page 1" or "…are listed in an attachment to this document", detail of the contact person or operational management position and the telephone and fax numbers including the country code, and email address (if available) at which operational management can be contacted without undue delay for issues related to flight operation, airworthiness, flight and cabin crew competency, dangerous goods and other matters, as appropriate. As a minimum, these shall be:
    (a) The Accountable Manager;
    (b) Flight Operations post holder;
    (c) Training post holder;
    (d) Maintenance (Airworthiness) post holder;
    (e) Ground Operations post holder;
    (f) Compliance (Quality) post holder (manager);
    (g) Safety post holder (manager); and
    (h) Security post holder (manager).

These contact details shall be listed in the Operations Manual Part A e. g.: "Contact details are listed in the operations manual, Gen/Basic, Chapter 1. …."

8. The Operator's name.
9. Issuing date of the AOC (date-month-year).
10. Revision date of the AOC (date-month-year).
11. Insert revision number. For the first issue insert "Original".
12. Name, title and signature of the CAAT's authorized representative. In addition, the official stamp must be applied on the AOC.

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2.2 Operations Specifications

OPERATIONS SPECIFICATIONS

The Civil Aviation Authority of Thailand Telephone: +66 2568 8842-3 Fax: +66 2568 8848 E-mail: caataoc@caat.or.th	
AOC No.: XX/XXX Ops Spec No.: XX Revision No.: XX Operator name: XXXXXX Trading name: Dba XXXXX	(.....) Director General The Civil Aviation Authority of Thailand Date: Mmmm yyyy
Aircraft model: XXXXX (Authorized aircraft: aircrafts nationality and registration mark and all operations shall be in accordance with List of Authorized Aircraft for Specific Approval)	
Types of operation: Commercial Air Transportation ☐ Passengers ☐ Cargo ☐ Other:	
Area(s) of operation: ☐ Domestic ☐ International: ☐ Asia ☐ Africa ☐ Australia ☐ Europe ☐ North America ☐ South America ☐ Antarctica ☐ Other.....	
Special limitations:_____	

Specific Approval	Yes	No	Description	Remarks
Dangerous goods	☐	☐		
Low visibility operations: - Approach and landing - Take-off - Operational credit(s)	☐	☐	☐ CAT II RVR ___ m/DH ___ ft. ☐ CAT III RVR ___ m/DH ___ ft. ☐ RVR ___ m ☐ Automatic Landing, ☐ HUD, ☐ EVS, ☐ SVS, ☐ CVS	
RVSM ☐ N/A	☐	☐		
OPERATIONS SPECIFICATIONS				

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AOC No.: XX/XXX Ops Spec No.: XX Revision No.: XX Operator name: XXXXXX Trading name: Dba XXXXX	(.....) Director General The Civil Aviation Authority of Thailand Date: Mmmm yyyy

Specific Approval	Yes	No	Description	Remarks
EDTO ☐ N/A	☐	☐	Threshold time:_____minutes Maximum diversion time:_____minutes	
AR navigation specifications for PBN operations	☐	☐		
Continuing airworthiness				
EFB	☐	☐		
Other:	☐	☐	Other Navigation specifications for PBN operations: ☐ RNP 1 ☐ RNP 2 ☐ RNP 4 ☐ RNAV 1/RNAV 2 ☐ RNAV5 ☐ RNAV 10 ☐ RNP APCH: ☐ LNAV ☐ LNAV/VNAV ☐ LPV ☐ MNPS Additional Approval: ☐ CPDLC/ ADS-C ☐ ADS-B ☐ PBCS	

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Figure 2 Operations Specifications (OPSPEC)

Notes:

1. Insert the associated AOC number.
2. Insert the associated Operations Specifications number.
3. Insert revision number. For the first issue insert “Original”.
4. Insert the Operator’s registered name and the operator’s trading name, if different. Insert “dba” before the trading name (for “doing business as”).
5. Insert the name, title and the signature of CAAT’s authorized representative, and the date of issue of the operations specifications (date-month-year). In addition, the official stamp must be applied.
6. Insert the Commercial Aviation Safety Team (CAST) / ICAO designation of the aircraft make, model and series, or master series, if a series has been designated (e.g. Boeing-737-3K2 or Boeing-777-232). The CAST/ ICAO taxonomy is available at: http://www.intlaviationstandards.org and ensure aircraft nationality and registration mark and all operations shall be in accordance with Attachment to Operations Specifications.
7. Other Special type of transportation. (e.g. emergency medical service).
8. List the geographical area(s) of authorized operation, flight information as defined in Domestic, International (Asia, Africa, Australia, Europe, North America, South America, Antarctica, and other). Refer to The list of countries below.
9. List the applicable special limitations (e.g. VFR only, day only).
10. List in this column the most permissive criteria for each specific approval or the approval type (with appropriate criteria).
11. Insert the applicable precision approach category (CAT II or CAT III). Insert the minimum RVR in meters and decision height in feet. One line is used per listed approach category.
12. Insert the approved minimum take-off RVR in meters, or the equivalent horizontal visibility if RVR is not used. One line per approval may be used if different approvals are granted.
13. List the airborne capabilities (i.e. automatic landing, HUD, EVS, SVS, CVS) and associated operational credit(s) granted.
14. RVSM approval as applicable, “Not applicable (N/A)” box may be checked only if the aircraft maximum ceiling is below FL 290.
15. If Extended Diversion Time Operations (EDTO) specific approval does not apply based on AOCR Chapter 2, Paragraph 22 for Extended Diversion Time Operations (EDTO), select “N/A”. Otherwise a threshold time and maximum diversion time must be specified.
16. The threshold time and maximum diversion time may be listed in distance (NM), as well Details of each particular aeroplane-engine combination for which the threshold time is established and maximum diversion time has been granted may be listed under ‘remarks’. One line per approval may be used if different approvals are granted.

17. Performance-based navigation (PBN): One line is used for each PBN AR navigation specification approval (e.g. RNP AR APCH), with appropriate limitations listed in the "Description" column.
18. Insert the name of the person or position responsible for ensuring that the continuing airworthiness of the aircraft and the compliance of Thai laws and Regulations.
19. List the EFB types and functions used for the safe operation of aeroplanes and with any applicable limitations. (Specifically, approved EFB hardware and software applications are contained in [operations manual reference])
20. Other authorizations or data can be entered here. Use one line (or one multi- line block) per authorization (e.g. Navigation specifications for PBN operation, special approach authorization, MNPS, PBCS, approved navigation performance).

2.3 List of Authorized Aircraft for Specific Approval

List of Authorized Aircraft for Specific Approval

AOC No: XX/XXXX Air Operator Name: XXXXXX
Attachment to Operations Specification No.: XX Revision No.: XX
Attachment Issue No. XXX Date: dd mmm yyyy

List of Authorized Aircraft for Specific Approval

Aircraft Type	Registration/ MSN	Specific Approval List																				
		EDTO		RVSM	EFB	MNPS	CPDLC / ADS-C	ADS-B	PBCS	RNP AR	RNP			RNAV					RNP APCH			
		Threshold Time (Minutes)	Diversion Time (Minutes)								1	2	4	1	2	5	10	LNAV	LNAV / VNAV	LPV

Remark: ✓ : means the Specific Approval × : means Not Applicable

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List of Authorized Aircraft for Specific Approval

CAAT
สำนักงานการบินพลเรือนแห่งประเทศไทย
The Civil Aviation Authority of Thailand

List of Authorized Aircraft for Specific Approval
(All Weather Operations, AWO)

Aircraft Type	Registration/ MSN	LVTO (m)	CAT II RVR(m)/ DH(ft)	CAT III RVR(m)/ DH(ft)	Operational Credits				
					Automatic Landing	HUD	EVS	SVS	CVS

Remark: ✓ : means the Specific Approval × : means Not Applicable

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Figure 3 List of Authorized Aircraft for Specific Approval

Note:

1. Insert the associated AOC number.
2. Insert the Operator's registered name and the operator's trading name, if different. Insert "dba" before the trading name (for "doing business as").
3. Insert the associated Operations Specifications number.
4. Insert the revision number. For the first issue insert "Original".
5. Insert attachment issue number and date (dd-mmm-yyyy).
6. Insert the associated Type of Aircraft.
7. Insert Registration or MSN.
8. For Specific Approval List mark "✓" if not applicable mark "X".
9. Insert Low Visibility Take-off in metres.
10. Insert the applicable precision approach CAT II. Insert the minimum RVR in metres and decision height in feet. (a decision height lower than 60 m (200 ft.) and with either a visibility not less than 30 m (100ft) and a runway visual range not less than 300 m)
11. Insert the applicable precision approach CAT III. Insert the minimum RVR in metres and decision height in feet. (a decision height lower than 30 m (100 ft.) or no decision height and a runway visual range not less than 175 m)
12. For Operational Credits mark "✓" if not applicable mark "X".

3 LIST OF COUNTRIES

The List of Countries

Asia Region

1	Afghanistan	18	Japan	35	Qatar
2	Armenia	19	Jordan	36	Saudi Arabia
3	Azerbaijan	20	Kazakhstan	37	Singapore
4	Bahrain	21	Kuwait	38	South Korea
5	Bangladesh	22	Kyrgyzstan	39	Sri Lanka
6	Bhutan	23	Laos	40	State of Palestine
7	Brunei Darussalam	24	Lebanon	41	Syria
8	Cambodia	25	Macao	42	Taiwan
9	China	26	Malaysia	43	Tajikistan
10	Cyprus	27	Maldives	44	Thailand
11	Georgia	28	Mongolia	45	Timor-Leste
12	Hong Kong	29	Myanmar	46	Turkey
13	India	30	Nepal	47	Turkmenistan
14	Indonesia	31	North Korea	48	United Arab Emirates
15	Iran	32	Oman	49	Uzbekistan
16	Iraq	33	Pakistan	50	Vietnam
17	Israel	34	Philippines	51	Yemen

Africa Region

1	Algeria	21	Gabon	40	Nigeria
2	Angola	22	Gambia	41	Réunion
3	Benin	23	Ghana	42	Rwanda
4	Botswana	24	Guinea	43	Saint Helena
5	Burkina Faso	25	Guinea-Bissau	44	Sao Tome and Principe
6	Burundi	26	Kenya	45	Senegal
7	Cabo Verde	27	Lesotho	46	Seychelles
8	Cameroon	28	Liberia	47	Sierra Leone
9	Central African Republic	29	Libya	48	Somalia
10	Chad	30	Madagascar	49	South Africa
11	Comoros	31	Malawi	50	South Sudan
12	Congo	32	Mali	51	Sudan
13	Côte d'Ivoire	33	Mauritania	52	Tanzania
14	Democratic Republic of the Congo	34	Mauritius	53	Togo
15	Djibouti	35	Mayotte	54	Tunisia
16	Egypt	36	Morocco	55	Uganda
17	Equatorial Guinea	37	Mozambique	56	Western Sahara
18	Eritrea	38	Namibia	57	Zambia
19	Eswatini	39	Niger	58	Zimbabwe
20	Ethiopia				

Australia Region

1	American Samoa	9	Micronesia	17	Samoa
2	Australia	10	Nauru	18	Solomon Islands
3	Cook Islands	11	New Caledonia	19	Tokelau
4	Fiji	12	New Zealand	20	Tonga
5	French Polynesia	13	Niue	21	Tuvalu
6	Guam	14	Northern Mariana Islands	22	Vanuatu
7	Kiribati	15	Palau	23	Wallis and Futuna Islands
8	Marshall Islands	16	Papua New Guinea		

Europe Region

1	Albania	17	Gibraltar	33	Netherlands
2	Andorra	18	Greece	34	North Macedonia
3	Austria	19	Holy See	35	Norway
4	Belarus	20	Hungary	36	Poland
5	Belgium	21	Iceland	37	Portugal
6	Bosnia and Herzegovina	22	Ireland	38	Romania
7	Bulgaria	23	Isle of Man	39	Russia
8	Channel Islands	24	Italy	40	San Marino
9	Croatia	25	Latvia	41	Serbia
10	Czechia	26	Liechtenstein	42	Slovakia
11	Denmark	27	Lithuania	43	Slovenia
12	Estonia	28	Luxembourg	44	Spain
13	Faeroe Islands	29	Malta	45	Sweden
14	Finland	30	Moldova	46	Switzerland
15	France	31	Monaco	47	Ukraine
16	Germany	32	Montenegro	48	United Kingdom

North America Region

1	Anguilla	15	Dominica	29	Panama
2	Antigua and Barbuda	16	Dominican Republic	30	Puerto Rico
3	Aruba	17	El Salvador	31	Saint Barthélemy
4	Bahamas	18	Greenland	32	Saint Kitts and Nevis
5	Barbados	19	Grenada	33	Saint Lucia
6	Belize	20	Guadeloupe	34	Saint Martin
7	Bermuda	21	Guatemala	35	Saint Pierre and Miquelon
8	British Virgin Islands	22	Haiti	36	Saint Vincent and the Grenadines
9	Canada	23	Honduras	37	Sint Maarten
10	Caribbean Netherlands	24	Jamaica	38	Trinidad and Tobago
11	Cayman Islands	25	Martinique	39	Turks and Caicos Islands
12	Costa Rica	26	Mexico	40	United States of America (USA)
13	Cuba	27	Montserrat	41	United States Virgin Islands
14	Curacao	28	Nicaragua		

South America Region

1	Argentina	6	Ecuador	11	Peru
2	Bolivia	7	Falkland Islands	12	Suriname
3	Brazil	8	French Guiana	13	Uruguay
4	Chile	9	Guyana	14	Venezuela
5	Colombia	10	Paraguay		

Antarctica Region

No countries in the list.

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APPENDIX B

ORGANISATION AND CONTENTS OF AN OPERATIONS MANUAL

1 ORGANISATION

An operation manual shall be organised with the following structure:

(a) General;

(b) Aircraft operating information;

(c) Routes and Aerodromes; and

(d) Training.

2 CONTENTS

The operations manual shall contain at the least the following:

2.1 General

(a) A statement that the operations manual complies with applicable laws, the air operator certification conditions and corresponding operations specifications;

(b) A list and a summarized description of the different parts of the manual, their contents, applicability and utilization;

(c) A statement that the operations manual contains operating instructions which must be followed by all personnel;

(d) A registration sheet for amendments and revisions, including dates of registration and validity;

(e) List of effective pages; and

(f) Amendment and revision changes indicated by marks or signs in text, graphics and diagrams.

2.1.1 Instructions outlining the responsibilities of each member of the crew and the other members of the operating staff pertaining to the conduct of flight operations.

2.1.2 Flight and duty time limitations and rest schemes for flight and cabin crew members.

2.1.3 A list of the navigational equipment to be carried including any requirements relating to operations where performance-based navigation is prescribed.

2.1.4 Where relevant to the operations, the long- range navigation procedures, engine failure procedure for ETOPS and the nomination and utilisation of diversion aerodromes.

2.1.5 The circumstances in which a radio listening watch is to be maintained.

2.1.6 The method for determining minimum flight altitudes.

2.1.7 The methods for determining aerodrome operating minima.

2.1.8 Safety precautions during refuelling with passengers on board.

2.1.9 Ground handling arrangements and procedures.

2.1.10 Procedures for pilots-in-command when an accident is observed.

2.1.11 The flight crew for each type of operation including the designation of the succession of command.

2.1.12 Specific instructions for the computation of the quantities of fuel and oil to be carried, taking into account all circumstances of the operation including the possibility of loss of pressurisation and the failure of one or more engines while en route.

2.1.13 The conditions under which oxygen shall be used and the amount of oxygen determined in accordance with the Aircraft Operating Manual.

2.1.14 Instructions for mass and balance control.

2.1.15 Instructions for the conduct and control of ground de-icing/anti-icing operations.

2.1.16 The specifications for the operational flight plan.

2.1.17 Standard operating procedures (SOP) for each phase of flight. (Refer to ICAO Doc 9806 Appendix 2 to chapter 3 Standard Operating Procedures, Checklists and Crew Briefings.)

2.1.18 Instructions on the use of normal checklists and the timing of their use.

2.1.19 Departure contingency procedures.

2.1.20 Instructions on the maintenance of altitude awareness and the use of automated or flight crew altitude call-out.

2.1.21 Instructions on the use of autopilots and auto throttles in IMC.

Note: - *Instructions on the use of autopilots and auto-throttles, together with 2.1.26 and 2.1.30, are essential for avoidance of approach and landing accidents and controlled flight into terrain accidents.*

2.1.22 Instructions on the clarification and acceptance of ATC clearances, particularly where terrain clearance is involved.

2.1.23 Departure and approach briefings.

2.1.24 Procedures for familiarisation with areas, route and aerodromes.

2.1.25 Stabilised approach procedure.

2.1.26 Limitation on high rates of descent near the surface.

2.1.27 Conditions required to commence or to continue an instrument approach.

2.1.28 Instructions for the conduct of precision and non-precision instrument approach procedures.

2.1.29 Allocation of flight crew duties and procedures for the management of crew workload during night and IMC instrument approach and landing operations.

2.1.30 Instructions, training or awareness programmes, as appropriate for:

(a) The avoidance of controlled flight into terrain and policy for the use of the Ground Promixty Warning Systems (GPWS); and

(b) Upset Prevention and Recovery.

2.1.31 Policy, instructions, procedures and training requirements for the avoidance of collisions and the use of the airborne collision avoidance system (ACAS).

Note: - *Procedures for the operation of ACAS are contained in PANS-OPS (ICAO Doc 8168), Volume 1, Part VIII, Chapter 3, and in PANS-ATM (ICAO Doc 4444), Chapters 12 and 15.*

2.1.32 Information and instructions relating to the interception of civil aircraft including:

(a) Procedures, for pilots-in-command of intercepted aircraft; and

(b) Visual signals for use by intercepting and intercepted aircraft.

2.1.33 For aeroplanes intended to be operated above 49000 ft (15 000 m):

(a) Information which will enable the pilot to determine the best course of action to take in the event of exposure to solar cosmic radiation; and

(b) Procedures in the event that a decision to descend is taken, covering:

(i) The necessity of giving the appropriate ATS unit prior warning of the situation and of obtaining a provisional descent clearance;

(ii) The action to be taken in the event that communication with the ATS unit cannot be established or is interrupted; and

(c) Procedures to maintain records such that the total cosmic radiation dose received by each crewmember over a period of 12 consecutive months can be determined.

2.1.34 Information on the safety management system and related flight safety programs as are relevant to flight operations.

2.1.35 Information and instructions on the carriage of dangerous goods, including action to be taken in the event of an emergency. These shall include the labelling and marking of dangerous goods, the manner in which they must be loaded on or suspended beneath an aircraft, the responsibilities of members of the crew in respect of the carriage of dangerous goods and the action to be taken in the event of emergencies arising involving dangerous goods.

(a) For an approved operator the following content shall be described:

(i) The operator’s Policy on the transport of dangerous goods (e.g. self-imposed prohibition on certain dangerous goods) include the policy and procedure for the transport of COMAT (company material, spare parts);

- Approved/non-approved dangerous goods;
- Restrictions for dangerous goods transportation (e.g. no transport of radioactive material); and

- Person within the company responsible for dangerous goods and/or dangerous goods coordinator contact.

(ii) Operator's policy for general exceptions for dangerous goods carried by an aircraft;

- Airworthiness and Operational Items, including spares;
- Conditions for carriage of portable electronic devices (PEDs) and spare batteries;
- Veterinary Aid;
- Medical Aid for a patient;
- Excess baggage being sent as cargo; and
- Items permitted in baggage, including:
  - Operator's procedure for granting approval for certain items in baggage; and
  - Operator's procedures for carriage of battery powered mobility aids.
- Provision information to passengers;

(iii) Marking and labelling of packages

(iv) Detailed assignment of responsibilities (Duties of all personnel involved with transport of dangerous goods)

(v) Operator's acceptance procedure and acceptance checklist;

(vi) Operator's Loading, including

- Inspections for damage or leakage;
- Prohibition on passengers when carrying "cargo aircraft only" dangerous goods;
- Prohibition on the carriage of dangerous goods on the flight deck or in a cabin occupied by passengers;
- Details of the location and numbering system of cargo compartments;
- Segregation and separation;
- Securing and orientation;
- Protection against damage;
- Loading of dry ice;
- Loading of magnetised material; and
- Loading of radioactive material.

(vii) External carriage of dangerous goods (if applicable);

(viii) Information to the Pilot-in-Command

- Example NOTOC;
- The personnel (job title or function) with responsibilities for operational control of an aircraft be provided with the information provided on the NOTOC; and
- Availability on ground for the duration of flight.

(ix) Retention of documents;

(x) Information to assist in the detection of undeclared dangerous goods and forbidden items in baggage, including:

- General descriptions; and
- GHS Labels.

(xi) Provision of information for use in responding to dangerous goods incidents in flight;

(xii) Provision of information by pilot in command in the event of an in-flight emergency;

(xiii) Information to be provided to emergency services in the event of:

- Aircraft accident or serious incident; and
- Aircraft incident.

(xiv) Reporting:

- Dangerous goods incidents;
- Dangerous goods accidents;
- Dangerous goods occurrences; and
- Undeclared/mis-declared dangerous goods.

(xv) Removal of contamination;

(xvi) Dangerous Goods Training requirement:

- Approval policy;
- General requirements of training and recurrent training;
- Syllabus;
- Instructor qualifications; and
- Identification of training and testing materials.

(b) For a non-approved operator, the following need content shall to be covered described:

(i) The operator's Policy on the transport of dangerous goods (e.g. self-imposed prohibition on certain dangerous goods) include the policy and procedure for the transport of COMAT (company material, spare parts):

- Approved/non-approved dangerous goods;
- Restrictions for dangerous goods transportation (e.g. no transport of radioactive material); and
- Person within the company responsible for dangerous goods and/or dangerous goods coordinator contact.

(ii) Operator's policy for general exceptions for dangerous goods carried by an aircraft:

- Airworthiness and Operational Items, including spares;
- Conditions for carriage of portable electronic devices (PEDs) and spare batteries;
- Veterinary Aid;
- Medical Aid for a patient;
- Excess baggage being sent as cargo; and
- Items permitted in baggage, including:
  - Operator's procedure for granting approval for certain items in baggage; and
  - Operator's procedures for carriage of battery powered mobility aids.

(iii) Provision information to passengers;

(iv) Marking and labelling of packages;

(v) Detailed assignment of responsibilities (Duties of all personnel involved with transport of dangerous goods);

(vi) Operator's Loading, quantity of Dry ice in compartment;

(vii) Information to assist in the detection of undeclared dangerous goods and forbidden items in baggage, including:

- General descriptions; and
- GHS Labels.

(viii) Reporting:

- Dangerous goods incidents;
- Dangerous goods accidents;

- Dangerous goods occurrences; and
- Undeclared/mis-declared dangerous goods.

(ix) Removal of contamination;

(x) Dangerous Goods Training requirement:

- Approval policy;
- General requirements of training and recurrent training;
- Syllabus;
- Instructor qualifications; and
- Identification of training and testing materials.

Note:- *The information in operation manual for dangerous goods given to staff and agents must have minimum information accordance with "Guidance Material for the preparation of ddangerous goods section in the operations manual AEROPLANES and/or HELICOPTERS".*

2.1.36 Security instructions and guidance.

2.1.37 A checklist of the procedures to be followed in searching for a bomb in case of suspected sabotage and for inspecting aeroplanes for concealed weapons, explosives or other dangerous devices when a wellfounded suspicion exists that the aeroplane may be the object of an act of unlawful interference, supported by guidance on the course of action to be taken should a bomb or suspicious object be found and information on the least-risk bomb location specific to the aircraft.

2.1.38 Instructions and training requirements for the use of Head-Up Displays (HUD) and Enhanced Vision Systems (EVS) equipment as applicable.

2.1.39 Instructions and training requirements for the use of the EFB, as applicable.

2.2 Aircraft Operating Information

2.2.1 Certification limitations and operating limitations.

2.2.2 The normal, abnormal and emergency procedures and checklists to be used by the flight crew

2.2.3 Operating instructions and information on climb performance with all engines operating

2.2.4 Flight planning data for pre-flight and in-flight planning with different thrust/power and speed settings.

2.2.5 The maximum crosswind and tailwind components for each aeroplane type operated and the reductions to be applied to these values having regard to gusts, low visibility, runway surface conditions, crew experience, use of autopilot, abnormal or emergency circumstances, or any other relevant operational factors.

2.2.6 Instructions for aircraft loading and securing of load.

2.2.7 Aircraft systems, associated controls and instructions for their use

2.2.8 The minimum equipment list and configuration deviation list for the aeroplane types operated and specific operations authorised, including any requirements relating to operations in where performance-based navigation is prescribed.

2.2.9 Checklist of emergency and safety equipment and instructions for their use.

2.2.10 Emergency evacuation procedures, including type specific procedures, crew coordination, assignment of crew's emergency positions and the emergency duties assigned to each crew member.

2.2.11 The normal, abnormal and emergency procedures to be used by the cabin crew, the checklists relating thereto and aircraft systems information as required, including a statement related to the necessary procedures for the coordination between flight and cabin crew.

2.2.12 Survival and emergency equipment for different routes and the necessary procedures to verify its normal functioning before take-off, including procedures to determine the required amount of oxygen and the quantity available.

2.2.13 The ground-air visual signal code for use by survivors,

2.3 Routes, Aerodromes and Heliports

2.3.1 A route guide to ensure that the flight crew will have, for each flight, information relating to communication facilities, navigation aids, aerodromes, instrument approaches, instrument arrivals and instrument departures as applicable for the operation, and such other information as the operator may deem necessary for the proper conduct of flight operations.

2.3.2 The minimum flight altitudes for each route to be flown.

2.3.3 Aerodrome operating minima for each of the aerodromes that are likely to be used as aerodromes of intended landing or as alternate aerodromes.

2.3.4 The increase of aerodrome operating minima in case of degradation of approach or aerodrome facilities.

2.3.5 Instructions for determining aerodrome operating minima for instrument approaches using HUD and EVS.

2.3.6 The necessary information for compliance with all flight profiles required by regulations, including but not limited to, the determination of:

(a) Take-off runway length requirements for dry, wet and contaminated conditions, including those dictated by system failures which affect the take-off distance;

(b) Take-off climb limitations;

(c) En-route climb limitations;

(d) Approach climb limitations and landing climb limitations;

(e) Landing runway length requirements for dry, wet and contaminated conditions, including systems failures which affect the landing distance; and

(f) Supplementary information, such as tire speed limitations.

2.3.7 The level of Rescue and Fire Fighting Service (RFFS) protection available at any aerodrome to ensure that an acceptable level of protection is available for the aeroplane.

2.4 Training

2.4.1 Details of the flight crew training programme.

2.4.2 Details of the cabin crew training programme.

2.4.3 Details of the flight operations officer/ flight dispatcher training programme when employed in conjunction with the operator's method of flight supervision.

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APPENDIX C

FLIGHT TIME AND FLIGHT DUTY PERIOD LIMITATION REQUIREMENTS

SECTION 01

Applicability

The AOC holder, operating the aeroplane with multi-pilot operations for commercial air transport, with a maximum operational passenger seating configuration ('MOPSC') of more than 19 seats, shall comply with the requirements designated for Flight Time and Flight Duty Period Limitation in this section as follows:

Article 1. Definitions

(1) **Acclimatised**
A crew member is considered acclimatised when that crew member has spent 3 consecutive local nights free of duty within a time zone which is 2 hours wide. The crew member will remain acclimatised thereafter until a duty period finishes at a place where local time differs by more than 2 hours from that at the point of departure.

(2) **Accommodation**
A quiet and comfortable place not open to the public with the ability to control light and temperature, equipped with adequate furniture that provides a crew member with the possibility to sleep, with enough capacity to accommodate all crew members present at the same time and with access to food and drink for the purpose of standby.

(3) **Adequate Rest Facility**
A business class seat which can recline for a crew member. In case of a business class seat is not available as a suitable rest facility, an economy class seat which can recline and the seat shall stay away from the galley and passengers can be substituted.

(4) **Augmented flight crew**
A flight crew that comprises more than the minimum number required to operate the aircraft and in which each flight crew member can leave their assigned post and be replaced by another appropriately qualified flight crew member for the purpose of in-flight rest.

(5) **Cabin Crew member**
A crew member who performs, in the interest of the safety of passengers, duties assigned by the operator or the Pilot in Command (PIC) of the aircraft, but who shall not act as a flight crew member.

(6) **Crew member**
A person assigned by an operator to perform duties on board an aircraft, including, Flight crew member and Cabin crew member.

(7) **Day Off**
A day which a crew member is free of all duties and shall be notified in advance. A Rest Period may be included as part of the Day Off.

(8) **Duty**
Any task that a crew member performs for the operator, including, flight duty, administrative work, training, positioning and standby when it is likely to induce fatigue.

(9) **Duty Period**
A period which starts when a crew member is required by the operator to report for or to commence a duty and ends when that person is free from all duties.

(10) **Fatigue**
A physiological state of reduced mental or physical performance capability resulting from sleep loss, extended wakefulness, circadian phase, and/ or workload (mental and/ or physical activity) that can impair a person's alertness and ability to perform safety-related operational duties.

(11) **Flight crew member**
A licensed crew member charged with duties essential to the operation of an aircraft during a flight duty period.

(12) **Flight Duty Period (FDP)**
A period that commences when a crew member is required to report for duty that includes a flight or a series of flights, start counting at least 1 hour before the Schedule Departure Time and stop counting at least 30 minutes after the aircraft finally comes to rest at the end of the last flight on which he/she is a crew member and all engines or propellers are shut down. A period of Full Flight Simulator (FFS) and Positioning to operate the flight which is likely to induce fatigue shall be counted as FDP but a positioning shall not be counted as a sector.

For the aircraft with a maximum take-off weight of 5700 kg or less, the flight duty period shall start counting at least 45 minutes before the Schedule Departure Time and stop counting at least 15 minutes after the aircraft finally comes to rest at the end of the last flight on which he/she is a crew member and all engines or propellers are shut down.

(13) **Flight time/Block time**
The total time between an aeroplane first moving from its parking place for the purpose of taking off (Off-Block) until it finally comes to rest at the end of the flight and all engines or propellers are shut down (On-Block).

(14) **Home base**
The location nominated by the operator to the crew member from where the crew member normally starts and ends a Duty Period or a series of Duty Periods.

(15) **Local day**
A 24-hour period commencing at 00:00 local time

(16) **Local Night**
A period of 8 hours falls between 22:00 and 08:00 local time.

(17) **Positioning**
The transfer of a non-operating crew member from place to place on surface or air transport at the behest of the operator, excluding;
- Transportation from the crew member's accommodation to report for duty at home base and vice versa.

- Local transportation (away from base) from place of rest to report for duty and vice versa.

(18) **Reporting time**
The time at which a crew member is required by the operator to report for duty.

(19) **Rest Period**
A continuous, uninterrupted and defined period of time, following duty or prior to duty, during which a crew member is free of all duties.

In case of positioning, the rest period shall start counting after the on-block time and end at the commencement of next Duty. The positioning after a FDP shall not be counted as a Rest Period.

(20) **Roster**
A list provided by the operator of the times when a crew member is required to undertake duties. The roster shall include, but not limited to the elements of Flight Time, Duty Period, and Day Off.

(21) **Sectors**
The segment of an FDP between an aircraft first moving under its own power until it next comes to rest after landing, on the designated parking position.

(22) **Standby duty**
A defined period of time during which a crew member is required by the operator to be available to receive an assignment for a specific duty without an intervening rest period.

(23) **Suitable Accommodation**
A location in a quiet environment and equipped with a bed, which is sufficiently ventilated, has a device for regulating temperature and light intensity, and access to food and drink for the purpose of standby and rest.

(24) **Suitable Rest Facility**
An area in an aircraft such as a bunk or other surfaces that allows for a flat or near flat sleeping position where is located separately from the cockpit, a galley and passengers, or a seat that can recline for a flat or near flat sleeping position in an area that allows the crew member to control light, temperature, and provides isolation from noise and disturbance.

(25) **Unforeseen operational circumstances**
An unplanned event, such as aircraft unserviceability, industrial action, operational contingencies, and other unforeseeable occurrences. It excludes circumstances that are known sufficiently in advance.

(26) **Window of Circadian Low (WOCL)**
The period between 02:00 and 05:59 hours in the time zone to which a crew member is acclimatised.

Article 2. Operator and Crew Member Responsibilities

(1) Duty rosters shall be prepared and published sufficiently in advance to provide crew members the opportunity to plan adequate rest. Consideration shall be given to the cumulative effects of undertaking long duty hours interspersed with minimum rest, and of avoiding rosters that result in the serious disruption of an established pattern of working and sleeping. Rosters should cover a period of at least 4 weeks.

(2) The roster shall include, but not limited to the elements of Flight Time, Duty Period, and Day Off.

(3) Flights shall be planned to be completed within the allowable FDP taking into account the time necessary for pre-flight duties, the flight and turnaround times, and the nature of the operation.

(4) In order to avoid any detriment to a crew member' s performance, opportunities to consume a meal shall be arranged when the FDP exceeds 5 hours.

(5) The operator shall nominate a home base for each crew member, from where the crew member will normally start and end a Duty Period or a series of Duty Periods. The home base shall be assigned with a degree of permanence.

(6) A crew member must not operate the flight when he or she knows that he or she is fatigued or feels unfit to the extent that the safety of the flight may be adversely affected, or in a state which is not ready to make a flight for reasons of health, body and mind.

(7) A Crew member should make the best use of the facilities and opportunities that are provided for rest and for the consumption of meals, and they should plan and use their rest periods properly to ensure that they are fully rested.

Article 3. The Flight Duty Periods and Flight Time requirements for Crew members

(1) For an aeroplane with Multi Pilot and Cabin crew operations with a maximum take-off weight (MTOW) over 5,700 kg

Maximum Flight Duty Period (hours)								
Local Time of Departure	**Sector**							
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8 or more**
06.00 – 07.59	13	12:15	11:45	11:15	10:45	9:45	9	9
08.00 – 14.59	13.30	13:15	12:30	11:45	11:15	10:45	9:30	9
15.00 – 21.59	13	12:15	11:30	10:45	10	9:15	9	9
22.00 – 05.59	11	10:15	9:30	9	9	9	9	9

(2) If flight duty periods comprise at least one sector as specified in the flight schedule more than 9 hours (8 hours if the FDP finished or are in the period of 02.00 - 05.59 AM of a local time at departure aerodrome) shall have at least one augmented pilot.

(3) Within any 7 consecutive days, Flight Time of the Crew members shall not exceed 34 hours.

(4) Within any 28 consecutive days, Flight Time of the Crew members shall not exceed 110 hours.

(5) Within any 365 consecutive days, Flight Time of the Flight crew shall not exceed 1,000 hours.

(6) The Flight Time calculations when the crew is augmented are as follows:

(a) Not less than 80 % of Flight Time if the crew is augmented by one pilot.
(b) Not less than 75 % of Flight Time if the crew is augmented by two pilots.
(c) Not less than 70 % of Flight Time if the crew is augmented by three pilots.

(7) The Flight Time calculations for a cabin crew member are as follows:

(a) 80 % of Flight Time, for a sector which has Flight Time more than 8 hours.
(b) 75 % of Flight Time, for a sector which has Flight Time more than 10 hours.
(c) 70 % of Flight Time, for a sector which has Flight Time more than 12 hours.

Article 4. Standby Duty

(1) The standby period shall not exceed 12 hours within 24 hours. The continuous standby period shall not exceed 72 hours and shall have a rest period not less than 24 hours before the next flight duty.

(2) For airport standby, the operator shall arrange an accommodation where is quiet and isolated from noise and disturbance for crew members.

Article 5. The extension of a maximum Flight Duty Period from Unforeseen operational circumstances

(1) The conditions to modify the limits on flight duty, duty and rest periods only at the discretion of the Pilot in Command (PIC) in the case of Unforeseen operational circumstances, which start at or after the reporting time, shall comply with the following:

(a) The maximum daily FDP may not be increased by more than 2 hours unless the flight crew has been augmented, in which case the maximum FDP may be increased by not more than 3 hours;
(b) If on the final sector within a FDP and the allowed increase in (a) is exceeded because of unforeseen operational circumstances after take-off, the flight may continue to the planned destination or alternate aerodrome; and
(c) The Rest Period following the FDP may be reduced but can never be less than 8 hours.

(2) In case of unforeseen operational circumstances which could lead to severe fatigue, the PIC shall reduce the actual FDP and/or increase the Rest Period in order to eliminate any detrimental effect on flight safety.

(3) The PIC shall consult all crew members on their alertness levels before deciding the modifications under Article 5 (1) and (2).

(4) The PIC shall submit a report to the operator when an FDP is increased or a rest period is reduced at his or her discretion.

(5) The operator shall submit the PIC's discretion report of the FDP extension or Rest Period reduction of crew members due to unforeseen operational circumstances to the CAAT within 14 days after the PIC's discretion.

(6) The operator shall implement a non-punitive process for the use of the discretion described under this provision and shall describe it in the operations manual.

Article 6. The extension of a maximum Flight Duty Period for the crew members.

(1) Flight crew member who operates an aeroplane with two-man crew. The maximum Flight Duty Periods may be extended as follow:

Type of Operation	**Augmentation**	**Maximum FDPs (hours)**	
		Adequate Rest Facility (hours)	**Suitable Rest Facility (hours)**
Two-man crew	1 pilot	14	16
	2 pilots	16	20

(2) Cabin crew members who have the specified hour of rest. The maximum Flight Duty Periods may be extended as follow:

Hours of Rest	**Maximum FDPs (hours)**	
	Adequate Rest Facility	**Suitable Rest Facility**
Less than 2 hours	Not extended	Not extended
2 hours but not reach to 3 hours	14	16
3 hours but not reach to 4 hours	16	18
More than 4 hours	18	20

Article 7. Rest Periods of crew members.

(1) Flight Duty Periods not exceeding 8 hours shall have continuous Rest Periods of not less than 8 hours, then Flight Duty can be continued.

(2) Flight Duty Periods are more than 8 hours, but not exceeding 10 hours, shall have continuous Rest Periods not less than 10 hours, then Flight Duty can be continued.

(3) Flight Duty Periods are more than 10 hours, but not exceeding 12 hours, shall have continuous Rest Periods not less than 12 hours, then Flight Duty can be continued.

(4) Flight Duty Periods are more than 12 hours, but not exceeding 14 hours, shall have continuous Rest Periods not less than 14 hours, then Flight Duty can be continued.

(5) Flight Duty Periods are more than 14 hours, but not exceeding 16 hours shall have continuous Rest Periods not less than 16 hours, then Flight Duty can be continued.

(6) Flight Duty Periods are more than 16 hours, but not exceeding 20 hours shall have continuous Rest Periods not less than 24 hours, then Flight Duty can be continued.

(7) Flight Duty Periods under Article 3 (2) shall have continuous Rest Periods of not less than 18 hours, then Flight Duty can be continued.

(8) The CAAT may allow the operator to reduce the Rest Periods under the criteria above if the operator demonstrates that reducing the Rest Periods still retains safety, based on the experience of the past including the scientific study.

(9) Use of controlled rest on the flight deck, if applicable;

(a) Controlled rest on the flight deck is a fatigue mitigation strategy for flight crews. It shall not be as a scheduling tool. It is not a substitute for proper prefight sleep or for augmented crew and associated inflight rest, but is intended as a response to unexpected fatigue experienced during flight operations.

(b) The operator shall monitor the use of controlled rest on the flight deck to evaluate whether existing mitigation strategies are adequate.

(c) The Pilot-in-Command shall report to the operator when controlled rest on the flight deck has been availed. A report on all such occurrences shall be provided by the operator to CAAT on a regular basis.

(d) Controlled rest shall only be used on flights of sufficient length such that it does not interfere with required operational duties.

(e) Controlled rest shall only be used during low workload phases of flight (e.g., during cruise flight).

(f) Controlled rest shall not be used as a method for extending crew duty periods.

(g) Procedures for controlled rest on the flight deck shall be published and included in the Operations Manual.

(h) Recommended Procedures for Controlled Rest on the Flight Deck

Note: - *This list is not exhaustive, nor are all of these procedures necessarily required*

(i) Only one pilot may take controlled rest at a time in his seat. The harness should be used and the seat positioned to minimise unintentional interference with the controls.

(ii) The autopilot and auto-thrust systems (if available) should be operational.

(iii) Any routine system or operational intervention which would normally require a cross check, should be planned to occur outside controlled rest periods.

(iv) Controlled rest on the flight deck may be used at the discretion of the captain to manage both unexpected fatigue and to reduce the risk of fatigue during higher workload periods later in the flight.

(v) It should be clearly established who will take rest, and when it will be taken. If the Pilot-in- Command requires, the rest may be terminated at any time.

(vi) The Pilot-in-Command should define criteria for when his/her rest should be interrupted.

(vii) Hand-over of duties and wake-up arrangements should be reviewed.

(viii) Flight crews should only use controlled rest if they are familiar with the published procedures.

(ix) A third crewmember (not necessarily a pilot) may be involved to monitor controlled flight deck rest. This may include a planned wake-up call, a visit to be scheduled just after the planned rest period ends, or a third crewmember on the flight deck throughout controlled rest.

(x) The controlled rest period should be no longer than 40 minutes, to minimise the risk of sleep inertia on awakening.

(xi) Controlled rest should only be allowed for rest preparation. This should include an operational briefing, completion of tasks in progress, and attention to any physiological needs of either crew member.

(xii) A short period of time should be allowed for rest preparation. This should include an operational briefing, completion of tasks in progress, and attention to any physiological needs of either crew member.

(xiii) During controlled rest, the non-resting pilot must perform the duties of the pilot flying and the pilot monitoring, be able to exercise control of the aircraft at all times and maintain situational awareness. The non-resting pilot cannot leave his/her seat for any reason, including physiological breaks.

(xiv) Aids such as eye shades, neck supports, ear plugs, etc, should be permitted for the resting pilot.

Article 8. Records

(1) The operator shall keep records of information of each crew member and ensure that this information is accessible by individual crew members. Each crew member shall also keep their records of information consisting of the following information:

(a) Flight Time;
(b) The start, duration, and end of each Flight Duty Period;
(c) Duty Period;
(d) Rest Periods.

(2) The information in Article 8 (1) shall be recorded completely and accurately.

(3) Crew members shall check their own record of information with the operator before performing the flight duty. Crew members shall inform the operator when find that the information under Article 8 (1) does not meet the requirement of CAAT.

(4) The operator shall keep the records under Article 8 (1) for a period of 24 months from the date when the crew member performed the duty.

(5) The operator shall keep the PIC's discretion report of the Flight Duty Period extension or the Rest Period reduction of crew members for at least 6 months from the PIC's discretion.

SECTION 02

Applicability

The Commercial Air Transport- Helicopter, A non-scheduled on demand commercial air transport operation with an aeroplane with a maximum operational passenger seating configuration ('MOPSC') of 19 or less, and Commercial Air Transport with Emergency Medical Services, shall comply with the requirements designated for Flight Time and Flight Duty Period Limitation in this section as follows:

Article 1. Definition

1. **Acclamatise**

A crew member is considered acclimatised when that crew member has spent 3 consecutive local nights free of duty within a time zone which is 2 hours wide. The crew member will remain acclimatised thereafter until a duty period finishes at a place where local time differs by more than 2hours from that at the point of departure.

2. **Accommodation**

A quiet and comfortable place not open to the public with the ability to control light andtemperature, equipped with adequate furniture that provides a crew member with the possibility tosleep, with enough capacity to accommodate all crew members present at the same time and with access to food and drink for the purpose of standby and split duty.

3. **Augmented flight crew**

A flight crew that comprises more than the minimum number required to operate the aircraft and inwhich each flight crew member can leave their assigned post and be replaced by another appropriately qualified flight crew member for the purpose of in-flight rest.

4. **Break**

A period of time within a flight duty period, shorter than a rest period, during which a crew memberis free from all tasks

5. **Crew member**

A person assigned by an operator to perform duties on board an aircraft, including, Flight crewmember and Cabin crew member.

6. **Day Off**

A day which a crew member is free of all duties and shall be notified in advance. A rest period maybe included as part of the day off.

7. **Duty**

Any task that a crew member performs for the operator, including, flight duty, administrative work,training, positioning and standby when it is likely to induce fatigue.

8. **Duty period**

A period which starts when a crew member is required by the operator to report for or to commence aduty and ends when that person is free from all duties.

9. Fatigue

A physiological state of reduced mental or physical performance capability resulting from sleep loss,extended wakefulness, circadian phase, and/ or workload (mental and/ or physical activity) that can impair a person's alertness and ability to perform safety-related operational duties.

10. Flight crew member

A licensed crew member charged with duties essential to the operation of an aircraft during a flight dutyperiod.

11. Flight duty period

A period that commences when a crew member is required to report for duty that includes a flight or a series of flights, start counting at least 1 hour before the Schedule Departure Time and stop counting 30minutes after the aircraft finally comes to rest at the end of the last flight on which he/she is a crewmember and all engines or propellers are shut down or rotor blades are stopped.

For the aircraft with a maximum take-off weight of 5700 kg or less, the flight duty period shallstart counting at least 45 minutes before the Schedule Departure Time and stop counting 15 minutes after the aircraft finally comes to rest at the end of the last flight on which he/she is a crew member andall engines or propellers are shut down.

12. Flight time/ Block Time

Aeroplane:

The total time between an aircraft first moving from its parking place for the purpose of taking off until itfinally comes to rest at the end of the flight and all engines or propellers are shut down.

Helicopter: The total time from the moment a helicopter's rotor blades start turning until the moment the helicopter finally comes to rest at the end of the flight, and the rotor blades are stopped.

13. Home base

The location nominated by the operator to the crew member from where the crew member normallystarts and ends a duty period or a series of duty periods.

14. Local Night

A period of 8 hours falls between 22:00 and 08:00 local time.

15. Long Range

The continuous non-stop flights involving any sector having a continuous flight time of over 12 hrs andup to 14 hrs, and Flight Duty Period up to 18 hrs.

16. Mixed Duty

When a crew member is required to report for a duty in advance of the stipulated reporting time, for ascheduled flight or series of flight, to carry out a duty at the behest of Operator, the time spent on that duty shall be part of the subsequent FDP.

17. Night

The period between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise as may be prescribed by the appropriate authority.

18. Positioning

The transfer of a non-crew member from place to place on surface or air transport at the behest of theoperator, excluding;

- Transportation from the crew member's accommodation to report for duty at home base and vice versa.
- Local transportation (away from base) from place of rest to report for duty and vice versa.

19. Reporting time

The time at which a crew member is required by the operator to report for duty.

20. Rest period

A continuous, uninterrupted and defined period of time, following duty or prior to duty, during which acrew member, instructor or trainee is free of all duties.

In case of positioning, the rest period shall start counting after the on-block time and end at thecommencement of next Duty. The positioning after a flight duty period shall not be counted as a rest period.

21. Roster

A list provided by the operator of the times when a crew member is required to undertake duties.The roster shall include, but not restricted to the elements of Flight Time, Duty Period and Day Off.

22. Sectors

The segment of an FDP between an aircraft first moving for the purpose of taking off until it comesto rest after landing on the designated parking position.

23. Standby duty

A defined period of time during which a crew member is required by the operator to be available to receive an assignment for a specific duty without an intervening rest period.

For airport standby, the operator shall arrange an accommodation where is quiet and isolate fromnotice and disturbance for crew members.

24. Suitable Accommodation

A location in quiet environment and equipped with a bed, which is sufficiently ventilated, has a device for regulating temperature and light intensity, and access to food and drink for the purpose of standby, split duty and rest.

25. Window of Circadian Low (WOCL)

The period between 02:00 and 05:59 hours in the time zone to which a crew member is acclimatised.

26. Unforeseen operational circumstance

An unplanned event, such as aircraft unserviceability, industrial action, operational contingencies, and other unforeseeable occurrences. It excludes circumstances that are known sufficiently in advance such as scheduled charters, planned runway shortening etc.

Requirements

Article 2. Operator and Crew Member Responsibilities

(1) Duty rosters shall be prepared and published sufficiently in advance to provide crew members the opportunity to plan adequate rest. Consideration shall be given to the cumulative effects of undertaking long duty hours interspersed with minimum rest, and of avoiding rosters that result in theserious disruption of an established pattern of working and sleeping.

(2) The roster shall include, but not limited to the elements of Flight time, Duty period and Day off.

(3) Flights shall be planned to be completed within the allowable flight duty period taking into account the time necessary for pre-flight duties, the flight and turnaround times, and the nature of the operation.

(4) In order to avoid any detriment to a crew member's performance, opportunities to consume ameal shall be arranged when the flight duty period exceeds 5 hours.

(5) The operator shall nominate a home base for each crew member, from where the crew member will normally start and end a duty period or a series of duty periods. The home base shall be assigned with adegree of permanence.

(6) A crew member must not operate the flight when he or she knows that he or she is fatigued or feels unfit to the extent that the safety of the flight may be adversely affected, or in a state which isnot ready to make a flight for reasons of health, body and mind.

(7) A Crew member should make the best use of the facilities and opportunities that are provided forrest and for the consumption of meals, and they should plan and use their rest periods properly to ensure that they are fully rested.

Article 3. The Flight Duty Periods and Flight Time requirements for Crewmembers

(1) For an aeroplane with a Single Pilot operation.

Maximum Flight Duty Period (hours)					
Local Time of Departure	Sectors				
	4 or Less than	5	6	7	8 or more
06.00 – 07.59	10	9:15	8:30	8	8
08.00 – 14.59	11	10:15	9:30	8:45	8
15.00 – 21.59	10	9:15	8:30	8	8
22.00 – 05.59	9	8:15	8	8	8

(2) For an aeroplane with Multi Pilot operations with a maximum take-off weight (MTOW) not exceeding 5,700 kg.

Maximum Flight Duty Period (hours)							
Local Time of Departure	Sectors						
	1	2	3	4	5	6	7 or more
05.00 – 05.59	13	13	12	12	12	11	11
06.00 – 12.59	13.30	13:30	13	12	12	12	11
13.00 – 14.59	13	13	12	12	12	11	11
15.00 – 04.59	12	12	11	11	11	10	10

(3) For an aeroplane with Multi Pilot operations with a maximum take-off weight (MTOW) over 5,700 kg.

Maximum Flight Duty Period (hours)								
Local Time of Departure	Sectors							
	1	2	3	4	5	6	7	8 or more
06.00 – 07.59	13	12:15	11:45	11:15	10:45	9:45	9	9
08.00 – 14.59	13.30	13:15	12:30	11:45	11:15	10:45	9:30	9
15.00 – 21.59	13	12:15	11:30	10:45	10	9:15	9	9
22.00 – 05.59	11	10:15	9:30	9	9	9	9	9

(4) For a helicopter

Maximum Flight Duty Period and Flight Time (hours)				
	Single Pilot		Two Pilots	
Local Time of Departure	Maximum Flight Duty	Maximum Flight	Maximum Flight Duty	Maximum Flight
06.00 – 06.59	9	6	10	7
07.00 – 07.59	10	7	11	8
08.00 – 13.59	10	7	12	8
14.00 – 21.59	9	6	10	7
22.00 – 05.59	8	5	9	6

(5) If flight duty periods comprise at least one sector as specified in the flight schedule more than 9 hrs (8 hrs if the flight duty periods finished or are in the period of 02.00 - 05.59 AM of a local time at departure aerodrome) shall have at least one augmented pilot.

(6) For Emergency Medical Services operations, the maximum Flight Duty Period shall be in accordancewith Article 3 (1), (2) (3) and (4) as applicable. The crew members shall have a Rest Period before Flight Duty not less than 10 hours continuously and not less than the time prescribed in Article 7.

(7) Within any 7 consecutive days, Flight time of the Crew members shall not exceed 34 hrs.

(8) Within any 28 consecutive days, Flight time of the Crew members shall not exceed 110 hrs.

(9) Within any 365 consecutive days, Flight time of the Flight crew shall not exceed 1,000 hrs.

Article 4. The extension of a maximum Flight Duty Period from Unforeseen operationalcircumstances

(1) The conditions to modify the limits on flight duty, duty and rest periods only at the discretion of the Pilot in Command (PIC) in the case of Unforeseen operational circumstances, which start at or after thereporting time, shall comply with the following:

(a) the maximum Flight Duty Period may not be increased by more than 2 hours unless the flightcrew has been augmented, in which case the maximum Flight Duty Period may be increased by not more than 3 hours;

(b) if on the final sector within a Flight Duty Period and the allowed increase in (a) is exceeded because of unforeseen operational circumstances after take-off, the flight may continue to theplanned destination or alternate aerodrome;

(c) the rest period following the FDP may be reduced but can never be less than 8 hours.

(2) In case of unforeseen circumstances which could lead to severe fatigue, the PIC shall reduce the actual Flight Duty Period and/or increase the Rest Period in order to eliminate any detrimental effecton flight safety.

(3) The PIC shall consult all crew members on their alertness levels before deciding the modificationsunder Article 4 (1) and (2)

(4) The PIC shall submit a report to the operator when an FDP is increased or a rest period is reduced athis or her discretion.

(5) The operator shall submit the PIC's discretion report of the Flight Duty Period extension or Rest Period reduction of crew members due to Unforeseen operational circumstances to the CAAT within14 days after the PIC's discretion.

(6) The operator shall implement a non-punitive process for the use of the discretion described underthis provision and shall describe it in the operations manual.

Article 5. Duty Periods requirement for the crew members

(1) Within any 7 consecutive days, Duty time of the Crew members shall not exceed 60 hrs.

(2) Within any 14 consecutive days, Duty time of the Crew members shall not exceed 110 hrs.

(3) Within any 28 consecutive days, Duty time of the Crew members shall not exceed 190 hrs.

(4) The standby period shall not exceed 12 hours within 24 hours.

Article 6. The extension of a maximum Flight Duty Period from applying Rest Facility forthe crew members.

Flight crew member, who flies an aircraft operates with more than two man crew. The maximumFlight Duty Periods may be extended as follows:

Type of Operation	Augmentation	Maximum FDPs (hrs)	
		Adequate Rest Facility (hrs)	Suitable Rest Facility(hrs)
Two man crew	1 pilot	14	16
	2 pilots	16	20

Article 7. Rest Periods requirements for the crew members

(1) Flight Duty Periods not exceeding 8 hours shall have continuous Rest Periods of not less than 8 hours, then Flight Duty can be continued.

(2) Flight Duty Periods are more than 8 hours, but not exceeding 10 hours, shall have continuous RestPeriods not less than 10 hours, then Flight Duty can be continued.

(3) Flight Duty Periods are more than 10 hours, but not exceeding 12 hours, shall have continuous Rest Periods not less than 12 hours, then Flight Duty can be continued.

(4) Flight Duty Periods are more than 12 hours, but not exceeding 14 hours, shall have continuous Rest Periods not less than 14 hours, then Flight Duty can be continued.

(5) Flight Duty Periods are more than 14 hours, but not exceeding 16 hours, shall have continuous Rest Periods not less than 16 hours, then Flight Duty can be continued.

(6) Flight Duty Periods are more than 16 hours, but not exceeding 20 hours, shall have continuous Rest Periods not less than 24 hours, then Flight Duty can be continued.

(7) Flight duty periods under Article 3 (5) shall have continuous rest periods of not less than 18 hours,then flight duty can be continued.

(8) The CAAT may allow the operator to reduce the Rest Periods under the criteria above if the operator demonstrates that reducing the Rest Periods still retains safety, based on the experience of the past including the scientific study.

Article 8. Records

(1) The operator shall keep records of information of each crew member and ensure that this information is accessible by individual crew members. Each crew member shall also keep their records of information consisting of the following information:
   (a) Flight Time;
   (b) the start, duration and end of each Flight Duty Period;
   (c) Duty Period;
   (d) Rest Periods.

(2) The information in Article 8(1) shall be recorded completely and accurately.

(3) Crew members shall check their own record of information with the operator before performing the flight duty. Crew members shall inform the operator when find that the information under Article8(1) does not meet the requirement of CAAT.

(4) The operator shall keep the records under Article 8(1) for a period of 24 months from the datewhen the crew member performed the duty.

(5) The operator shall keep the PIC's discretion report of the Flight Duty Period extension or the RestPeriod reduction of crew members for at least 6 months from the PIC's discretion.

APPENDIX D

FLIGHT OPERATIONS OFFICER/FLIGHT DISPATCHERS TRAINING PROGRAM

1 INTRODUCTION

1.1 Operators are required to demonstrate an adequate organization with an approved method of control and supervision of flight operations. A flight operations officer/flight dispatcher licensed holder is normally employed to provide supervision of flight and to act as a close link between aircraft in flight and the ground services, and also between the aircrew and the operators' ground staff.

1.2 The principal duties of the flight operations officer/flight dispatcher shall:

(a) Assist the Pilot-in-Command in flight preparation and provide the relevant information required;

(b) Assist the Pilot-in-Command in preparing the operational and ATS flight plans, sign when applicable and file the ATS flight plan with the appropriate ATS unit;

(c) Furnish the Pilot-in-Command while in flight, by appropriate means, with information which may be necessary for the safe conduct of the flight; and

(d) Notify the appropriate ATS unit when the position of the aircraft cannot be determined by an aircraft tracking capability, and attempts to establish communication are unsuccessful.

1.3 In the event of an emergency, a flight operations officer/flight dispatcher shall:

(a) Initiate such procedures as outlined in the operations manual while avoiding taking any action that would conflict with ATC procedures; and

(b) Convey safety-related information to the Pilot-in-Command that may be necessary for the safe conduct of the flight, including information related to any amendments to the flight plan that become necessary in the course of the flight.

(c) Where necessary, notify the appropriate authorities without delay and request for assistance if required, if the emergency endangers the safety of the aircraft or persons and becomes known first to the flight operations officer/flight dispatcher.

Note: *It is equally important that the Pilot-in-Command also convey similar information to the flight operations officer/flight dispatcher during the course of the flight, particularly in the context of emergency situations.*

1.4 CAAT issue flight operations officer / flight dispatcher licenses.

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2 BASIC REQUIREMENTS

The flight operations officer/flight dispatcher shall hold a valid flight operations officer/flight dispatcher license.

2.1 Knowledge

2.1.1 The flight operations officer/flight dispatcher shall be able to demonstrate an appropriate level of knowledge in at least the subjects specified in paragraph 6. Such demonstration of knowledge shall be by means of an examination equivalent to that required to be undertaken by the flight operations officer/flight dispatcher who has completed a course of training.

2.2 Skill

2.2.1 The flight operations officer/flight dispatcher shall have demonstrated the ability to:

(a) Make an accurate and operationally acceptable weather analysis from a series of daily weather maps and weather reports; provide an operationally valid briefing on weather conditions prevailing in the general neighborhoods of a specific air route; forecast weather trends pertinent to air transportation with particular reference to destination and alternates;

(b) Determine the optimum flight plan for a given segment, and create accurate manual and/or computer flight plans;

(c) Provide operating supervision and all other assistance to a flight in actual or simulated adverse weather conditions, as appropriate to the duties of a flight operations officer/flight dispatcher; and

(d) Recognize and manage threats and errors.

3 ADDITIONAL OPERATOR-SPECIFIC REQUIREMENTS

3.1 In addition to the basic requirements given in paragraph 2 above, the operator shall not assign a flight operations officer/flight dispatcher to duty unless that person has:

(a) Satisfactorily completed a training course specific to the operator that addresses all the components of the operator's approved method of control and supervision of flight operations consistent with the nature and extent of the operations specified;

(b) Made, within the preceding 12 months, at least one familiarization flight in the flight crew compartment of an aircraft over any area for which that individual is authorized to exercise flight supervision. The flight should include landings at as many aerodromes as practicable.

Note: *For the purpose of the familiarization flight, the flight operations officer/flight dispatcher must be able to monitor the flight crew intercommunication system and radio communications, and be able to*

observe the actions of the flight crew from the crew reporting time until the completion of the crew's post-flight duties.

(c) Demonstrated to the operator a knowledge of:

(i) The contents of the operations manual;

(ii) The radio equipment in the aircraft used; and

(iii) The navigation equipment in the aircraft used;

(d) Demonstrated to the operator a knowledge of the following details concerning operations for which the officer is responsible and areas in which that individual is authorized to exercise flight supervision:

(i) The seasonal meteorological conditions and the sources of meteorological information;

(ii) The effects of meteorological conditions on radio reception in the aircraft used;

(iii) The peculiarities and limitations of each navigation system which is used by the operation; and

(iv) The aircraft loading instructions;

(e) Demonstrated to the operator knowledge and skills related to human performance relevant to dispatch duties; and

(f) Demonstrated to the operator the ability to perform the duties specified in paragraph 1.3 of the appendix.

3.2 A flight operations officer/flight dispatcher assigned to duty should maintain complete familiarization with all features of the operations which are pertinent to such duties, including knowledge and skills related to human performance.

4. AUTHORISATION BY THE OPERATOR

4.1 The operator shall establish a system to ensure that each flight operations officer/ flight dispatcher assigned to duty continues to meet all the requirements in this Appendix.

4.2 The operator shall ensure that appropriate action is taken to suspend, vary or revoke the authorization of a flight operations officer/flight dispatcher in the event that he or she fails to continue to meet the requirements of this Appendix.

5. MAINTAINING CURRENCY

5.1 To maintain currency, a flight operations officer/flight dispatcher shall dispatch the flight at least one flight every 90 consecutive days. A flight operations officer/flight dispatcher who fails to do so shall be required dispatch at least one flight under the supervision of another flight operations officer/flight dispatcher prior to resuming duties.

5.2 A flight operations officer/flight dispatcher who has not dispatched at least one flight in the preceding 6 months shall apply to the Requalification training programme for more details can be found in paragraph 8.4 of this appendix.

5.3 Every flight operations officer/flight dispatcher shall undergo a recurrent training program approved by the Authority and pass a proficiency test conducted by the operator once every 12 months.

6. TRAINING PROGRAM

Flight operations officer / flight dispatcher Training Program are divided into 4 types of courses training as follow details;

6.1 Initial Training (Newly hire): The operators shall provide thorough training in each subject area in the initial (newly hire) training program. The operator shall ensure that each flight operations officer/ flight dispatcher has mastered each skill required to perform adequately on the job.

In addition, flight operations officer/ flight dispatchers are usually required to complete on-the-job training (OJT) to become proficient in the required flight operations officer skills.

6.2 Difference Aircraft Training: This training program required for flight operations officer/flight dispatcher who has been trained and qualified for changing from one aircraft type to another aircraft type when assigned by the operator to dispatch a new aircraft type. The two areas of emphasis in difference training are the following:

(a) The unique features of the specific aircraft;

(b) The specific dispatcher duties for that aircraft.

6.3 Recurrent Training: This training program required conducted annually for flight operations officer/flight dispatcher license holder, who has been trained and qualified.

flight operations officer/flight dispatcher shall receive recurrent training and a proficiency test within the appropriate period to maintain currency.

6.4 Requalification Training: This training program required to requalify the flight operations officer/flight dispatcher to who has been trained and qualified by the operator, but who has become unqualified due to not having satisfactorily completed recurrent training, a proficiency check, or loss of recency experience for intervals.

7. TRAINING CURRICULUM

The various subjects that need to be covered during phase one training (Basic Knowledge) and phase two (Applied practical training).

The operator shall ensure that training program for flight operations officer/flight dispatcher shall be developed and documented by the operators in Operations Manual Part D or be a separate document which shall be approved by the Authority, it shall contain information, procedures and instructions to flight operations officer/flight dispatcher with respect to the safe operations of all aircraft types and classes.

The degree and scope of instruction that is outlined in the manual will depend on the number of aircraft type, size, complexity and composition of the organization. The maximum training hours per day shall be 8 hours.

Each training curriculum shall cover the difference between aircraft of the particular type operated by the operator to ensure that the flight operations officer or flight dispatcher are adequately trained to perform their assigned duties on difference aircraft being operated.

Training curriculum for flight operations officer/flight dispatcher shall consist of the subjects as following;

7.1 Phase One (Basic Knowledge)

Module	Subject Matter
1	Civil Air Law and Regulations (a) Certification of Operators; (b) The Convention On International Civil Aviation (The Chicago Convention); (c) International Air Transport Issues Addressed by The Chicago Convention; (d) The International Civil Aviation Organization (ICAO); (e) Responsibility for Aircraft Airworthiness; (f) Regulatory Provisions of the Flight Manual; and (g) The Aircraft Minimum Equipment List (MEL).
2	Aviation Indoctrinations / Aviation Instruction (a) Civil Aviation Regulatory, Civil Aviation Law, ICAO Annex Including Applicable Regulation; (b) Operator Policies, Procedures, Rules and Regulations; (c) Provisions and Limitation of the Air Operator Certificate Issued to The Operator Including Operations Specification; (d) The Aircraft Minimum Equipment List (MEL); (e) Regulatory Provisions of the Flight Manual; (f) The Dispatcher Procedure and Manual; (g) Aviation Terminology and Terms of Reference; (h) Theory of Flight and Flight Operations; (i) Aircraft Propulsion Systems; and (j) Aircraft Terminology And Terms Of Reference.
3	Aircraft System (a) Aircraft General; (b) Power Plants System; (c) Electrical System; (d) Hydraulic System; (e) Fuel System; (f) Pneumatic System; (If Applicable) (g) Air Conditioning and Pressurization; (h) Flight Control; (i) Landing Gear and Brake Systems;

Module	Subject Matter
	(j) Ice and Rain Protection; (If Applicable) (k) Equipment and Furnishing; (l) Navigation Equipment; (m) Auto Flight System; (If Applicable) (n) Flight Instrument; (o) Communication Equipment; (p) Warning System; (q) Fire Protection System; (r) Oxygen System; (If Applicable) (s) Lighting; (t) Emergency Equipment; and (u) Auxiliary Power Unit (APU) (If Applicable).
4	Aircraft Mass (Weight) And Performance. (Related to company aircraft use) (a) Basic Principles for Flight Safety; (b) Basic Mass (Weight) And Speed Limitations; (c) Take-Off Runway Requirements; (d) Climb Performance Requirements; (e) Landing Runway Requirements; (f) Buffet Boundary Speed Limitations; (g) Adverse Flight Condition; and (h) Contaminated Runway Operations.

Module	Subject Matter
5	Navigation (a) Position, Distance and Time; (b) True, Magnetic and Compass Direction; (c) Gyro Heading Reference and Grid Direction; (d) Introduction to Chart Projection: (i) The Gnomonic Projection; (ii) The Mercator Projection; (iii) Great Circles On Mercator Charts; (iv) Other Cylindrical Projections; (v) Lambert Conformal Conic Projections; and (vi) The Polar Stereographic Projection. (e) ICAO Chart Requirements; (f) Charts Used by A Typical Operator; (g) Measurement of Airspeed; (h) Track and Ground Speed; (i) Use of Slide-Rules, Computers and Scientific Calculators; (if Applicable) (j) Measurement of Aircraft Altitude; (k) Point of No Return; (l) Critical Point; (m) General Determination of Aircraft Position; (n) Introduction to Radio Navigation; (o) Ground-Based Radar and Direction-Finding Stations; (p) Relative Bearings; (q) VOR/DME-Type Radio Navigation; (r) Instrument Landing Systems; (s) Navigation Procedures; (t) TCAS/ACAS; and (u) ICAO CNS/ATM Systems (An Overview).

Module	Subject Matter
6	Air Traffic Management (a) Introduction to Air Traffic Management; (b) Controlled Airspace; (c) Flight Rules; (d) ATC Clearance; (e) ATC Requirements for Flight Plans and Aircraft Reports; (f) Flight Information Service (FIS); (g) Alerting Service and Search and Rescue; (h) Communications Services (Mobile, Fixed); (i) Aeronautical Information Service (AIS); and (j) Aerodrome And Airport Services.
7	Meteorology (a) Atmosphere; (b) Atmospheric Temperature and Humidity; (c) Atmospheric Pressure; (d) Pressure, Wind Relationships; (e) Winds Near the Earth's Surface; (f) Wind in The Free Atmosphere; (g) Turbulence; (h) Vertical Motion in The Atmosphere; (i) Formation of Clouds and Precipitation; (j) Thunderstorms; (k) Aircraft Icing; (l) Visibility and RVR; (m) Volcanic Ash; (n) Surface Observations, Upper-Air Observations and Station Model; (o) Air Masses and Fronts, Frontal Depressions; (p) Weather at Fronts and Other Parts of the Frontal Depression; (q) Other Types of Pressure Systems; (r) General Climatology, Weather in The Tropics; (s) Aeronautical Meteorological Reports;

Module	Subject Matter
	(t) Analysis of Surface and Upper-Air Charts; (u) Prognostic Charts; (v) Aeronautical Forecasts; and (w) Meteorological Service For International Air Navigation.
8	Mass (Weight) and Balance Control (a) Introduction to Mass and Balance; (b) Load Planning; (c) Calculation of Payload and Load Sheet Preparation; (d) Aircraft Balance and Longitudinal Stability; (e) Moments and Balance; (f) The Structural Aspects of Aircraft Loading; (g) Dangerous Goods and Other Special Cargo; and (h) Issuing Loading Instructions.
9	Flight Planning (a) Introduction to Flight Planning; (b) Turbo-Jet Aircraft Cruise Control Methods; (c) Flight Planning Charts and Tables for Turbine Engine Aircraft; (d) Calculation of Flight Time and Minimum Fuel for Turbine Engine Aircraft; (e) Route Selection; (f) Flight Planning Situations; (g) Terrain Awareness / CFIT Avoidance; (h) Re Clearance; (i) The Flight Phases; (j) Documents to Be Carried On Flights; (k) Flight Planning Exercises; (l) Threats and Hijacking; (m) EDTO/ETOPS; and (n) Computerize and Flight Planning System (Related to company use).

Module	Subject Matter
10	Flight Monitoring (a) Position of Aircraft; (b) Effects of ATC Reroutes; (c) Flight Equipment Failures; (d) En Route Weather Changes; (e) Emergency Situations; (f) Flight Monitoring Resources; (g) Position Reports; (h) Ground Resource Availability; and (i) Aircraft Tracking System.
11	Communication – Radio (a) International Aeronautical Telecommunications Service; (b) Elementary Radio Theory; (c) Aeronautical Fixed Service; (d) Aeronautical Mobile Service; (e) Radio Navigation Service; and (f) Automated Aeronautical Service.
12	Operations Manual, Part A – General/Basic (a) Organization and Responsibilities; (b) Operational Control and Supervision; (c) Crew Composition; (d) Qualification Requirements; (e) Crew Health Precautions; (f) Flight Time Limitations; (g) Operating Procedures; (h) Handling, Notification and Reporting Occurrences; (i) Aircraft Leasing; and etc.
13	Operations Manual, Part B – Airplane Type Related Training (a) General Concept of Operations Manual Part B (b) Minimum Equipment List; and (c) Configuration Deviation List.

Module	Subject Matter
14	Operations Manual, Part C – Route and Aerodrome Instructions and Information (a) Route and Aerodrome; (b) Route Information; and (c) Aeronautical Chart for company used.
15	Specific Approvals Training (if applicable) (a) PBN Operations, RVSM, FANS, EFBs, PBCS and AWO etc. (i) Specific Aircraft Equipment's; (ii) Flight Planning; (iii) MEL/CDL Requirements; (iv) Normal/Abnormal Procedures; and (v) Contingency Procedures. (b) ETOPS/EDTO (i) ETOPS/EDTO Regulations and Operations Approval; (ii) Aircraft Performance; (iii) Dispatch Procedures; (iv) Diversion Procedures; (v) Area of Operations; (vi) Fuel Requirements; (vii) Dispatch Considerations MEL/CDL; (viii) Weather Minima, And Alternate Airports Selection; and (ix) Documentation.
16	Crisis Management (a) Emergency Response Plan.
17	Safety Management Systems *Course elements refer to the company Safety Management Systems training program.*
18	Aviation Security Awareness (Emergencies and Abnormal Situations) *Course elements refer to the approved Aviation Security training program.*

Module	Subject Matter
19	Quality Management System *Course elements refer to the company Quality Management Safety training program.*
20	Transport of Dangerous Goods by Air *Course elements refer to the approved Dangerous Goods training program.*
21	Crew Resource Management or Human Factor *Course elements refer to the company Crew Resource Management or Human Factor training program.*

7.2 Phase Two (Applied Practical Training)

Module 1: Applied Practical Flight Operations

To provide the trainee with practical experience in flight operations officer/flight dispatcher and the associated duties and responsibilities of the flight operations officer/flight dispatcher. the simulated or assumed operating conditions for each exercise must be clearly specified by the instructor. The exercises should be made as realistic as possible. Past flight records, meteorological forecasts, charts, weather observations, etc., can be used to advantage, and answers arrived at by the trainees compared to what actually took place. A group discussion after each exercise will prove beneficial in eliminating possible misconceptions.

Module 2: Flight Simulator Line Oriented Flight Training (LOFT) Observation

To provide trainees with a better understanding and awareness of the working environment in the cockpit of a commercial air transport aircraft and the practical duties of the flight crew under normal, abnormal and emergency operational situations.

Module 3: On the Job Training (Flight Dispatch Practices)

To develop trainee confidence by providing him /her with an opportunity to apply his / her newly acquired knowledge in an actual operational control environment. In addition, on-the-job training will enable him/her to have first-hand experience on the exigencies of the profession as it is performed by experienced flight operations officer / flight dispatchers under an actual operational environment.

Module 4: **Familiarization Flights**

Route familiarization is considered an essential and integral part of the training of flight operations officer/ flight dispatcher since it supplements that part of the appreciation of pilot work which cannot be learned in a flight simulator.

Note 1: *Module 1 the trainees shall apply the practical flight operations training under the supervision of Flight Operations Instructor.*

Note 2: *Module 4 for the Initial training trainees shall attend the familiarization flight at least 4 sectors, and recurrent training shall be at least 2 sectors. If the operator has more than one aircraft type fleet used, the familiarization flight shall apply to all aircraft fleet.*

Note 3: *The operator shall arrange the training Phase Two sequential by each module 1 to module 4.*

7.2.1 In the event that the flight operations officer/flight dispatcher has passed the theoretical test (Phase One – Basic Knowledge) but has not to performed a familiarization flight for more than 3 months, such flight operations officer/flight dispatcher shall re-attend and pass the theoretical test required by paragraph 8.1, 8.2, 8.3, and 8.4 before resuming their duties.

8. TRAINING SYLLABUS

PHASE ONE - BASIC KNOWLEDGE

Module	Subject	Initial		Difference Aircraft		Recurrent	
		Required	Min Hrs.	Required	Min Hrs.	Required	Min Hrs.
1	Civil Air Law and Regulations	X	14			O	*
2	Aviation Indoctrinations / Aviation Instruction:	X		O	*	O	*
3	Aircraft System. (Related to Company Aircraft Use)	X		X	6	X	4
4	Aircraft Mass (Weight) And Performance. (Related to Company Aircraft Use)	X	10	X	6	X	4
5	Navigation.	X	9	O	*	O	*
6	Air Traffic Management.	X				O	*
7	Meteorology.	X	31			X	2
8	Mass (Weight) And Balance Control.	X		X	12	X	4
9	Flight Planning	X		X		X	4
10	Flight Monitoring.	X		O		X	2

Module	Subject	Initial		Difference Aircraft		Recurrent	
		Required	Min Hrs.	Required	Min Hrs.	Required	Min Hrs.
11	Communication-Radio	X		O		O	*
12	Operations Manual, Part A – General/Basic.	X	12	O	*	X	2
13	Operations Manual, Part B - Airplane Type Related Training	X		X	4	X	2
14	Operations Manual, Part C -Route and Aerodrome Instructions and Information	X		O	*	O	*
15	Specific Approvals Training: PBN Operations, RVSM, FANS, EFBS, PBCS, ETOPS/EDTO, And AWO Etc.;	X	*	O	*	O	*
16	Crisis Management (Emergency Response Plan.)	X	*			X**	*
17	Safety Management Systems.	X	*			X**	*
18	Aviation Security. (Emergencies and Abnormal Situations)	X	*			X**	*
19	Quality Management System.	X	*			O**	*
20	Transport of Dangerous Goods by Air.	X	*			X**	*
21	Crew Resource Management or Human Factor	X	*			X**	*
	Minimum Total Hours	76		28		24	

Note:

X	The mandatory subject is required to include in the training program.
O	The additional subject that may include in the training program.
*	The operator shall specify the minimum training hours in the training syllabus.
**	Refer to the company recurrent training program.

PHASE TWO – APPLIED PRACTICAL TRAINING

Module	Subject Matter	Duration		
		Initial Training	Difference Training	Recurrent Training
1.	Applied Practical Flight Operations	8 Hrs.	-	4
2.	Flight Simulator Line Oriented Flight Training (LOFT) observation	1 Session (4 Hrs)	1 Session (4 Hrs)	-
3.	Flight Dispatch Functions (OJT)	30 Working Days	-	-
4.	Familiarization Flight	4 Sectors	2 Sectors	2 Sectors

(a) The module 1, the trainees shall have applied practical flight operations training under the supervision of the Flight Dispatcher Instructor.

(b) In case of module 2 could not carry out, the flight operations officer/flight dispatcher shall apply familiarization flight additional 2 sectors.

(c) The module 3, the flight operations officer/flight dispatcher shall attend the On the Job Training (OJT) under the supervision of experienced flight operations officer/flight dispatcher or flight dispatcher instructor or personnel who has the competence in the flight operations function.

(d) The module 4, if the operator has more than one aircraft type fleet used, the familiarization flight shall apply to all aircraft fleet and should be covered with the different routes for the Initial Training Program.

(e) The flight operations officer/flight dispatcher shall apply Module 1 to Module 4 within 3 months after complete the theoretical class.

Note: *The familiarization flight or LOFT is typically representative of the operational environment within which the flight operations officer/flight dispatcher will be working. Examples of a representative environment include-ultra long haul, long haul, short haul, over water, mountainous terrain, EDTO, areas of special navigational requirements, or passenger versus cargo flights.*

8.1 Initial Training (Newly hire)

This training program required for flight operations officer/flight dispatcher to ensure that each flight operations officer/flight dispatcher acquires the competence, knowledge, and skills required to perform the duties and responsibilities related to a flight operations officer/flight dispatcher. The training shall be conducted with a minimum of 76 hours.

8.2 Difference Aircraft Training

This training program required for flight operations officer/flight dispatcher who has been trained and qualified for changing from one aircraft type to another aircraft type when assigned by the operator to dispatch a new aircraft type. The two areas of emphasis in different training are the following:

(a) The unique features of the specific aircraft; and

(b) The specific dispatcher duties for that aircraft.

This will consist of an aircraft system, performance, special operations, and flight planning with a minimum of 28 hours. Additionally, the operator shall be arranging appropriate training courses with 2 sectors familiarization flight.

8.3 Recurrent Training

This training program required to conducted annually for flight operations officer/flight dispatcher, who has been trained and qualified to ensure the maintenance of competence, knowledge, and skills through a series of theoretical training, exercise, simulated exercises, written exam, etc. relevant to each aircraft type on which the flight operations officer/flight dispatcher will be assigned duties. The training shall be conducted as a minimum of 24 hours, and complete all of the subjects described in Phase One (Basic Knowledge) refer to paragraph 8 of this appendix.

Flight operations officer/flight dispatcher shall receive recurrent training and a proficiency test to maintain currency.

Recurrent training validity is 12 months. If carried out in 3 months preceding the expire, the subsequent validity will be 12 months from the original expiry.

8.4 Requalification Training

This training program required to requalify the flight operations officer/flight dispatcher to who has been trained and qualified by the operator, but who has become unqualified due to not having satisfactorily completed recurrent training, a proficiency check, or loss of recency experience for intervals.

The operator shall ensure that each flight operations officer/flight dispatcher who has become unqualified completes training and attend the On the Job Training (OJT) under supervision of flight operations officer/flight dispatcher licensed followed by familiarization flights as per the conditions below:

Gap Period	Require Training Hours (Minimum Hours)	OJT	Familiarization Flight
More than 6 Months - 12 Months	See note 1	2	-
More than 12 Months - 24 Months	24	3	2
More than 24 Months - 36 Months	36	7	2
More than 36 Months - 60 Months	48	7	2
More than 60 Months	Complete Initial Training Program		

Note 1: *A flight operations officer/flight dispatcher is required dispatch at least two (2) flight under the supervision of another flight operations officer/flight dispatcher and attend On the Job Training (OJT) for 2 days prior to resuming duties.*

Note 2: *The operator shall ensure that each flight operations officer/flight dispatcher who has become unqualified completes the subjects as described in the Recurrent Training Syllabus with require training hours.*

9. TRAINING FACILITIES

The operator shall ensure that suitable classroom training facilities are provided. An evaluation should be conducted and consideration should be given to subject matter, type of training (such as initial/recurrent), instructor's workload management, feedback/evaluations and size of facilities. The number of trainees shall be limited to 25 per classroom except joint training such as CRM, DG, and Aviation Security.

Each trainee's workspace should include space to house trainee's work surface, any additional equipment, the chair, space for chair pushback and maneuverability.

9.1 Use of Instructional Aids

(a) Instructional aids include the use of CBT, which may encompass the use of electronic devices as well as web-based training (commonly referred to as eLearning). Instructional aids can be used in a classroom setting or as part of distance learning.

(b) CBT can provide dynamic and interactive tools to address specific portions of a training program. CBT is predominantly relevant to knowledge objectives. A knowledge objective relates to the recall of facts, the identification of policies, rules, or procedures; generally committing concepts to memory. CBT is less appropriate for evaluating hands on motor skills or soft skills. CBT provides flexibility, allowing trainees to study at their own pace and according to their schedule. When exploring

the possibility of CBT, the operator should give consideration to the technology accessible and the equipment that is required to deliver the training.

If the operator chooses to conduct the CBT as part of distance learning, the review/testing of material delivered should be considered in a classroom environment. Regardless of the method used for CBT (classroom vs. distance learning), the training program should contain a means of testing or evaluation to ensure training effectiveness, currency, and that training objectives have been met.

10. PROFICIENCY CHECK FOR FLIGHT OPERATIONS OFFICER/FLIGHT DISPATCHERS

To demonstrate his proficiency, a flight operation officer/flight dispatcher shall undergo following test/examinations.

10.1 Written Test/Examination

Each flight operations officer/flight dispatcher after having undergone the prescribed training (basic knowledge) shall appear in a written examination conducted by the instructor and must achieve at least 70 percent in order to pass the theoretical test in each mandatory subjects.

10.2 Proficiency Check

The flight operations officers /flight dispatchers shall undergo proficiency check to demonstrate their proficiency to the flight dispatcher instructor or the personnel who has the competent in the flight operations function. The proficiency check shall commence after completed the Initial training and annual proficiency check.

11. FLIGHT DISPATCHER INSTRUCTOR

A training program and training standardization for flight operations officer/flight dispatcher shall be established. Flight Dispatcher Instructor shall be appropriately qualified to integrate elements of flight operations officer/flight dispatcher skills and knowledge.

Flight Dispatcher Instructors shall receive recurrent training and testing annually to ensure their competency with respect to delegated tasks by using the assessment process acceptable to the Authority, implemented by the operator or training organization.

The conduct of flight operations officer/flight dispatcher training and of tests carried out by the operator's instructors may be observed by Authority qualified inspectors. The Authority shall monitor the standards of all instructors by:

(a) Monitoring each instructor while he/she conducts a skill test or check;

(b) Reviewing the operators' utilization of instructors on a regular basis; and

(c) Monitoring during standardization and random checks.

The operators shall select and appoint the flight dispatch instructor and shall ensure their appointed instructors meet at least the appropriate minimum requirements in terms of experience and knowledge as specified in paragraph 11.1 Failure to comply with the operators' approved/accepted manuals or the Authority regulatory requirements may result in disqualifying that flight dispatch instructor and cancellation of previous training conducted.

11.1 Flight Dispatcher Instructor Qualifications

Flight Dispatcher Instructor shall:

(a) Have served a total of 5 years as a full-time qualified flight dispatcher with an airline;

(b) Have adequate skills and knowledge of the relevant flight operations and operations control;

(c) Have adequate knowledge of the principal duties and responsibilities of the flight operations officer/flight dispatcher as specified in ICAO Annex 6;

(d) Have adequate knowledge of the principal aircraft characteristic and performance;

(e) Have adequate knowledge which shall include:

(i) Civil Air Law and Regulation;

(ii) Weight (Mass) and Balance;

(iii) Navigation;

(iv) Air Traffic Management;

(v) Meteorology;

(vi) Flight Planning;

(vii) Flight Following and Monitoring; and

(viii) Communication and radio of aircraft used.

(f) Have received instruction in training techniques and skills in order to conduct flight operations officer/flight dispatcher training courses; which shall be included as follows:

(i) The learning process;

(ii) Elements of effective teaching;

(iii) Student evaluation and testing;

(iv) Course development;

(v) Lesson planning;

(vi) Classroom training techniques; and

(vii) Facilitation skills.

(g) Have demonstrated the knowledge, skills, and credibility required to train the flight

operations officer/flight dispatcher;

(h) Have completed a train the trainer course;

(i) Have completed flight operations officer/flight dispatcher training;

(j) Hold a recent valid flight operations officer/flight dispatcher license; and

(k) A flight dispatcher instructor holding a recent qualification as a flight dispatcher instructor may continue to be a flight dispatcher instructor after passed the assessment.

11.2 Assessment of Flight Dispatcher Instructor

(a) A flight dispatcher instructor shall be assessed by the operator when conducting the first flight operations officer/flight dispatch training program. The approval shall be valid as long as the instructor remains in the employment of the operator or organization. The assessment shall be valid for a period of 3 years.

(b) The operator shall ensure that the process for the assessment is included in Operations Manual Part D or be a separate document which shall be approved by the Authority. Describing methods for observing, recording, interpreting, and debriefing the flight dispatcher instructor. All personnel involved in the assessment must be credible and competent in the flight operations function.

11.3 Recency and Renewal of Qualification as Flight Dispatcher instructor

For recency of the 3 years validity period, the flight dispatcher instructor shall:

(a) Conduct at least 1 training class in any 12 months period; and

(b) Be assessed within the last 6 months of the 3 years validity period by the operator. If this requirement is not met, then the instructor shall conduct one training session under the supervision of a qualified instructor prior to resuming any training; and

(c) Flight dispatch instructors who have conducted at least one training session in the previous 12 months shall receive recurrent training, which shall be included all subjects in the operator's approved training program, except for the subjects instructed by the flight dispatch instructors. If this requirement is not met, the flight dispatch instructors shall receive recurrent training for all subjects, in accordance to the operator's approved training program.

11.4 Contracted Flight Dispatcher Training

If the operator chooses not to establish its own flight dispatcher training, another operator, a third party or a training organization may be contracted to provide the training. In the case of contracted flight dispatcher training, the operator shall ensure that the content of the course covers the specific culture, the type of operations, and the associated procedures of the operator.

12. RECORDS OF FLIGHT OPERATIONS OFFICER TRAINING AND TESTS

The operator shall have and maintain a system for the management and control of all training records to ensure the content and retention of such records is in accordance with the Authority regulations, as applicable, to ensure records are subjected to standardized processes for:

(a) Identification;

(b) Legibility;

(c) Maintenance;

(d) Retrieval;

(e) Protection and security; and

(f) Disposal, deletion (electronic records) and archiving.

12.1 Records must be maintained to show trainees' attendance at each type of training and the retention of the records period shall be a minimum of 3 years. The training record should include, but not limited to:

(a) Training (training dates, proficiency assessments, test records, course content, etc.);

(b) Aircraft familiarization (including flight package, voyage report as applicable); and

(c) Special training, if applicable

12.2 The operators shall keep records for all flight operations officer to show when the next training and tests are due for the recurrent. There should also be an effective system to guard against his/her duty being rostered when training and tests are overdue.

12.3 Records of all initial training, aircraft type-specific training/operator, recurrent training, differences training, route familiarization flights, and proficiency check of all flight operations officer/flight dispatcher shall be made fully available when requested by the Authority.

12.4 When utilizing an electronic system for the management and control of training records, the operator ensures the system provides for a scheduled generation of back-up record files.

12.5 To facilitate inspection by the Authorised Officers, all flight operations officer/flight dispatcher must carry their license issued by the Authority whenever they are on duty.

12.6 The operator should maintain the following training programme materials:

(a) Current training programme contents and lesson plans;

(b) Validation of training programme and results; and

(c) An annual programme update/review.

12.7 An operator is required to maintain the following records of their instructors and examiners:

(a) Qualifications and training record;

(b) Training classes observed and conducted;

(c) Examinations received and conducted;

(d) Checks as carried out by the authorized personnel;

(e) Records of performance review; and

(f) Licenses and certificates in accordance with regulatory requirements.

13. TERMS AND CONDITIONS

13.1 Modules and topics concerning aircraft technical, aircraft system, performance shall be conducted by operator qualified instructors.

13.2 The Crew Resource Management (CRM) training should be joint the class with flight crew.

13.3 The On the Job Training (OJT) may be conducted under the supervision of flight operations officer/flight dispatcher licensed or flight dispatcher instructor or personnel who has the competent in the flight operations function as applicable.

13.4 In the event that the flight operations officer/flight dispatcher has been completed training, and not performed his or her duties as an operating flight operations officer/ flight dispatcher for more than 6 months, the flight operations officer/flight dispatcher shall re-attend the training course and pass the examination before resuming their duties.

13.5 During the training course under item 8.1, 8.2, 8.3, or 8.4 if the operator has to temporarily suspend the training with reasonable causes, the operator shall inform the Authority without delay and provide the continued training within 30 days from the date such event terminated.

13.6 The Operator is responsible to consistently improve and develop their flight operations officer/ flight dispatcher training program to be up-to-date and be in accordance with safety standards, regulations, and requirements of the Authority. The modified training program must be submitted to the Authority at least 30 days for approval prior to the conduct of such training.

APPENDIX E

GUIDELINES FOR CABIN CREW TRAINING AND CHECKING

1 INTRODUCTION

The Civil Aviation Authority of Thailand (CAAT) requires all applicants for an Air Operator Certificate (AOC) to establish and maintain a training programme, approved by CAAT, to be completed by all persons before being assigned as a cabin crew member to familiarize themselves with the aviation environment and to acquire sufficient knowledge and proficiency required to perform the duties and discharge the responsibilities related to the safety of passengers and flight during normal, abnormal and emergency operations.

Training required shall cover at least the elements specified in Chapter 6 of this document. It shall include theoretical and practical training and related examination that the applicants shall undergo to demonstrate that they have attained the level of knowledge and proficiency required. In addition, the training programme shall be:

(a) Provided by training organisations or commercial air transport operators approved to do so by the competent authority;

(b) Performed by personnel suitably experienced and qualified for training elements to be covered; and

(c) Conducted according to a training programme and syllabus documented in the organisation's approval. The content of this chapter is adaptable and operators should tailor it to suit their operations.

2 CONDUCT OF TRAINING COURSES AND ASSOCIATED CHECKING

2.1 Equipment and Procedures

The following definitions apply for the purpose of training programmes, syllabi and the conduct of training and checking on equipment and procedures:

(a) **'Safety equipment'** means equipment installed/carried to be used during day-to-day normal operations for the safe conduct of the flight and protection of occupants (e.g. seat belts, child restraint devices, safety card, safety demonstration kit).

(b) **'Emergency equipment'** means equipment installed/carried to be used in case of abnormal and emergency situations that demand immediate action for the safe conduct of the flight and protection of occupants including life preservation (e.g. drop-out oxygen, crash axe, fire extinguisher, protective breathing equipment, manual release tool, slide-raft).

(c) **'Normal procedures'** means all procedures established by the operator in the operations manual for day-to-day normal operations (e.g. pre-flight briefing of cabin crew, pre-flight checks, passenger briefing, securing of galleys and cabin, cabin surveillance during flight)

(d) **'Emergency procedures'** means all procedures established by the operator in the operations manual for abnormal and emergency situations. For this purpose, 'abnormal' refers to a situation that is not typical or usual, deviates from normal operation and may result in an emergency.

2.2 Training Methods, Training Facilities and Devices

2.2.1 The operator shall establish training methods that take into account the following:

(a) Training should include the use of cabin training devices, audio-visual presentations, computer-based training and other types of training, as most appropriate to the training element; and

(b) A reasonable balance between the different training methods should be ensured so that the cabin crew member achieves the level of proficiency necessary for a safe performance of all related cabin crew duties and responsibilities.

2.2.2 When assessing the representative training devices to be used, further to the criteria specified in Chapter 6 of this document, the operator should:

(a) Take into account that a representative training device may be used to train cabin crew as an alternative to the use of the actual aircraft or required equipment;

(b) Ensure that those items relevant to the training and checking intended to be given accurately represent the aircraft or equipment in the following particulars:

(i) Layout of the cabin in relation to doors/exits, galley areas and safety and emergency equipment stowage as relevant;

(ii) Type and location of passenger seats and cabin crew stations;

(iii) Doors/exits in all modes of operation, particularly in relation to the method of operation, mass and balance and operating forces, including failure of power-assist systems where fitted; and

(iv) Safety and emergency equipment of the type provided in the aircraft (such equipment may be 'training use only' items and, for oxygen and protective breathing equipment, units charged with or without oxygen may be used); and

(c) Ensure that those items relevant to the training and checking intended to be given accurately represent the aircraft or equipment in the following particulars:

(i) Door/exit arming/disarming;

(ii) Direction of movement of the operating handle;

(iii) Direction of door/exit opening;

(iv) Power-assist mechanisms; and

(v) Assisting evacuation means such as slides and ropes.

(d) Take into account that differences in exit operating characteristics between actual aircraft exits and the emergency exit trainer can be of critical importance during an

emergency evacuation, especially as this may lead the cabin crew members to an incorrect assessment of the serviceability of the exit and/or to incorrectly operate that exit. When a representative training device does not replicate the actual aircraft exit operating characteristics, any differences between the operating characteristics of the actual aircraft exits and those of the emergency exit trainer shall be highlighted during training.

2.2.3 For classroom-based training, the operator shall take into account the following:

(a) General space requirements

In planning for space requirements, consideration should be given to the following:

(i) The trainee's work station;

(ii) The area required for hands-on exercises;

(iii) The instructor work stations; and

(iv) The storage area.

(b) Classroom facilities

The size of classrooms is dependent on the following:

(i) Number of trainees in a class;

(ii) Trainee work station size;

(iii) Class configuration;

(iv) Size of aisles;

(v) Use of media (in particular projected media); and

(vi) Hands-on exercises (if applicable).

(c) The learning environment

The key to a good learning environment is the elimination of discomforts and other undesirable characteristics. A good learning environment includes the following:

(i) The temperature should be comfortable;

(ii) Ventilation should be adequate;

(iii) Lighting should be of adequate level for work or viewing;

(iv) Distracting sound should be kept to a minimum;

(v) Work areas should be aesthetically pleasing;

(vi) Work stations, including chairs, should be comfortable;

(vii) Work space should be adequate;

(viii) Work area should be clean;

(ix) Training equipment should be adequate;

(x) Visual media should be visible from all angles and seats; and

(xi) Audio media should be audible to all present.

(d) Use of instructional aids

(i) Instructional aids include the use of CBT. For the purposes of this Appendix, CBT may encompass the use of electronic devices as well as web-based training (commonly referred to as eLearning). Instructional aids can be used in a classroom setting or as part of distance learning.

(ii) CBT can provide dynamic and interactive tools to address specific portions of a training programme. CBT is predominantly relevant for knowledge objectives. A knowledge objective relates to the recall of facts, the identification of policies, rules or procedures; generally committing concepts to memory. CBT is less appropriate for evaluating hands-on motor skills or soft skills. CBT provides flexibility, allowing trainees to study at their own pace and according to their schedule. When exploring the possibility of CBT, the operator should give consideration to the technology accessible and the equipment that is required to deliver the training.

(iii) Instructor and/or technical support are recommended for CBT. If the operator chooses to conduct the CBT as part of distance learning, the review/testing of material delivered should be considered in a classroom environment. Regardless of the method used for CBT (classroom vs. distance learning), the training programme should contain a means of testing or evaluation to ensure training effectiveness, currency, and that training objectives have been met.

(iv) CBT should be accompanied by a learning management system (LMS). Consideration should be given to the design of the programme and to each individual module. These should be maintained accordingly.

(v) Any operator without CBT may apply any other means of teaching aids training. The training programme should contain means of testing or evaluation to ensure training effectiveness, currency, and that training objectives have been met.

2.2.4 Safety and emergency equipment

Safety and emergency equipment used on the operator's aircraft shall be available during training, according to the applicable training session. Training for each piece of equipment should be based on the following, if applicable:

(a) General description;

(b) Use;

(c) Location(s);

(d) Pre-flight serviceability check(s);

(e) Removal from stowage;

(f) Operation;

(g) Conditions for operation;

(h) Operational limitations and duration of use;

(i) Operation under adverse conditions;

(j) Precautions for use; and

(k) Post-use procedures (including relocation of equipment, if applicable).

Emergency and survival equipment may include, but not limited to:

(a) Installed/portable emergency signaling system (e.g. Emergency Locator Transmitter, Radio Locator Beacon);

(b) Child restraint systems;

(c) Extension seat belt;

(d) Restraint device;

(e) Medical kit and its contents;

(f) Automated External Defibrillator (AED) and associated equipment (CPR masks, shields, resuscitator bags, etc.); and

(g) Any other equipment (including any additional equipment suited to the likely environment e.g. Arctic gear).

Equipment that is removed from operation, or other representative training equipment considered acceptable by the Authority, can be used for training purposes. The operator shall ensure that the training equipment, its components and features necessary to conduct effective training are in good condition.

2.2.5 Use of other operator training devices

(a) Where an operator arranges to use training devices owned by another operator, the training must comply with the approved training programme and operating procedures of the operator whose crew are being trained.

(b) If significant differences exist in terms of cabin layout and equipment, such training should be restricted accordingly.

2.3 Fire Fighting and Water Survival

2.3.1 A simulated firefighting exercise shall be conducted in a confined area, to simulate cabin fire, and under the supervision of an appropriate instructor. The device used for a simulated fire-fighting exercise should include aircraft furnishings as found on board an aircraft, such as seats, galley units, lavatories, panels, overhead bins and waste bins. Fire-fighting equipment and the restraints used shall be representative to those installed on an aircraft with respect to weight, dimensions, controls, types and operations.

2.3.2 Fire extinguishers used for live fire-fighting should be charged with the appropriate agent or with an environmentally friendly agent.

2.3.3 Wet drills should be carried out in a body of water or pool of sufficient depth to realistically perform the simulated exercise.

2.3.4 A life raft exercise should be conducted using life-saving equipment that is representative to that installed on the aircraft with respect to weight, dimensions, appearance, features and operation. The rafts may be substituted if the equipment used is similar with respect to weight, dimensions, appearance, and features. In such cases, training must address any differences in the operation of the raft.

2.4 Checking

2.4.1 Checking required for each training course shall be accomplished by the method appropriate to the training element to be checked. These methods include:

(a) Practical demonstration;

(b) Computer-based assessment;

(c) In-flight check; and

(d) Oral or written test.

2.4.2 Training elements that require individual practical participation may be combined with practical checks.

3 RECOMMENDATIONS FOR MANAGEMENT ASPECTS OF THE CABIN SAFETY TRAINING PROGRAMME

3.1 Overview

Cabin crew training managers, training programme developers, instructors and evaluators are integral to successful training programmes and the development of competent cabin crew members. These professionals shall possess a good understanding of the learning process and how to positively influence human behaviour. Training development and continued evaluation of training programmes are also needed to obtain quality training. Therefore, operators shall establish qualifications for key personnel and implement a process for the continuous improvement of training programmes.

Cabin crew safety training manager shall be appointed by the operator. The cabin crew safety training manager's qualifications shall be in accordance with Chapter 6 of this document, as a minimum.

The cabin crew safety training manager's responsibilities may include the following:

(a) Assuring a current and approved cabin crew safety training programme;

(b) Assuring training equipment and facilities meet the required standards;

(c) Providing advice into the development of safety and emergency procedures;

(d) Providing advice into the development of directives and notices to cabin crew members;

(e) Supervising cabin crew training personnel and ensuring that the appropriate training and guidance is provided.

(f) Assuming responsibilities delegated by the relevant management;

(g) Supervising the training of cabin crew members, in accordance with the approved training programme;

(h) Maintaining cabin crew training records;

(i) Determining the training strategy;

(j) Liaising with other company departments to ensure that cabin safety objectives are met;

(k) Liaising with regulatory authorities;

(l) In his/her absence, delegating all responsibilities to another adequately qualified person as determined by the operator; and

(m) Administering and communicating as necessary to fulfill the foregoing responsibilities.

3.2 Cabin Crew Instructor/Evaluator

3.2.1 The operators are required to qualify and assign different individuals to fulfill the distinct roles of cabin crew instructors and evaluator. If this is not the case, both the roles of the instructor and evaluator may be assigned to the same individual. However, there should be a clear distinction in the competencies required to perform the respective duties (i.e. instructor/evaluator). If the instructor also performs the role of an evaluator on trainees that he/she instructed, he/she should remain impartial during the assessment.

3.2.2 Prior to the issue of a cabin crew instructor qualification (e.g. certificate or authorization), all candidates should hold a cabin crew qualification, for which the privilege to instruct is being sought

3.2.3 Prior to the issue of a cabin crew evaluator qualification (e.g. certificate or authorization), all candidates should hold a cabin crew qualification, for which the privilege to examine is being sought.

3.2.4 Qualified and authorized instructors may be assigned to carry out instruction, and auditing duties to determine that all required performance standards have been satisfactorily achieved.

3.2.5 Qualified and authorized evaluator may be assigned to carry out assessments, and auditing duties to determine that all required performance standards have been satisfactorily achieved. The evaluator is responsible for making a determination of the actual standards attained and any recommendation for corrective action, if necessary.

3.2.6 Prior to an organization authorizing the provision of instruction, instructors shall undergo a selection process designed to assess that the individual’s knowledge, capability and competency are suitable for the instructor’s role and to determine the person’s motivation. In addition, selection of an instructor shall be based on criteria intended to define a proven capability in the subject for which he/she expects to instruct, in accordance with the competencies described in Chapter 6 of this document.

3.2.7 Prior to an organization authorizing the provision of examination, evaluators should undergo a selection process designed to assess that the individual’s knowledge, capability and competency are suitable for the evaluator’s role and to determine the person’s motivation. In addition, selection of an evaluator should be based on criteria intended to define a proven capability in the subject for which he/she intends to evaluate, in accordance with the competencies described in Chapter 6 of this document.

3.2.8 Training programmes for the instructor/evaluator role shall focus on development of the competencies listed in Chapter 6 of this document. The competency framework consists of competency units, competency elements, and performance criteria. The competency framework for instructors/evaluators of cabin crew shall be based on the following competency units:

(a) Manage safety of the training environment;

(b) Prepare the training environment;

(c) Manage and support the trainee;

(d) Conduct training;

(e) Perform trainee assessment;

(f) Perform course evaluation; and

(g) Continuously improve performance.

3.2.9 All instructors/evaluators shall receive recurrent training and be re-assessed annually by qualified personnel determined by operator according to a documented training and assessment process acceptable to the authority, implemented by the operator or training organization, or at intervals.

3.3 Cabin Crew Training Records

3.3.1 An operator shall have and maintain a system for the management and control of all training records to ensure the content and retention of such records is in accordance with CAAT regulations, as applicable, to ensure records are subjected to standardized processes for:

(a) Identification;

(b) Legibility;

(c) Maintenance;

(d) Retrieval;

(e) Protection and security; and

(f) Disposal, deletion (electronic records) and archiving.

3.3.2 When utilizing an electronic system for the management and control of training records, the operator ensures the system provides for a scheduled generation of back-up record files.

3.3.3 The operator shall maintain the following records for all of its cabin crew members. The training record shall include, but not limited to:

(a) Training (trainees' attendance, competency assessments, test records, course content, etc.);

(b) Aircraft qualifications (including familiarisation visits and flights, as applicable); and

(c) Special qualifications, if applicable (e.g. AED training, in-charge cabin crew member qualification, etc.).

3.3.4 The operator shall maintain the following training programme materials:

(a) Current training programme contents and lesson plans;

(b) Validation of training programme and results; and

(c) An annual programme update/review.

4 CABIN CREW TRAINING PROGRAMMES

The following different types of training that shall be provided, as a minimum (as applicable), to cabin crew members.

(a) Initial Training;

(b) Aircraft Type Specific Training/Operator Conversion Training;

(c) Recurrent Training;

(d) Differences Training; and

(e) In-Charge Cabin Crew Training and its Recurrent

4.1 Initial Training

4.1.1 Initial training is required for the persons who have not previously operated as a cabin crew member. The goal of initial training is to ensure that each trainee acquires the competencies, knowledge and skills required to perform the duties and responsibilities related to the safety of passengers and flight during normal, abnormal and emergency situations. The initial training shall be accomplished through classroom instruction and additionally (if applicable) computer-based training (CBT) complemented by a series of hands-on and simulated exercises such as first aid, firefighting and water survival training. Cabin crew trainees must complete initial training before they are assigned duties as cabin crew members.

4.1.2 The initial training shall be modular and include at least the following elements in the following table. Modules can be followed in any sequence.

TABLE 1: CABIN CREW INITIAL TRAINING
Minimum Topics to Cover
Aviation Indoctrination;
Aviation Security;
Crew Co-ordination;
Aeromedical Aspects and First Aid;
Rescue Breathing and Practical Cardio Pulmonary Resuscitation;
Fire and Smoke Training;
Water Survival Training;
Survival and the Use of Survival Equipment Training;
Human Factors and Crew Resource Management (CRM) Training;

Aerodrome Emergency Services;
Dangerous Goods Training, Prohibited and Dangerous Items;
Safety Management System Training;
Cabin Crew General and Services Duties and Responsibilities;
Abusive Passengers;
Handling Unaccompanied Minors;
Trafficking in Persons;
Seat Allocation;
Flight Time Limitations;
Aircraft Safety on the Ramp;
Passenger Briefing;
Cabin Baggage and Cabin Clutter;
Brace Positions;
Evacuation Procedures and Emergency Situations;
Crowd Control; and
Pilot Incapacitation.

Table 1 CABIN CREW INITIAL TRAINING

Note: *Detailed training requirements of each topic found in Table 1 can be referred to Chapter 6 of this document*

4.2 Aircraft Type Specific Training/Operator Conversion Training

4.2.1 Aircraft Type Specific Training/Operator Conversion Training shall include, but not limited to, the elements in the following table, if applicable to the particular aircraft.

TABLE 2: CABIN CREW AIRCRAFT TYPE SPECIFIC TRAINING / OPERATOR CONVERSION TRAINING
Minimum Topics to Cover
Emergency and Survival Equipment;
Fire and Smoke Training;
Protective Breathing Equipment;
Practical Training;
Pilot Incapacitation;

Passenger Briefing on Self Help Exits; Cabin Baggage and Cabin Clutter; Brace Positions; Aircraft Familiarisation Visits; and Familiarisation Flights.

Table 2 CABIN CREW AIRCRAFT TYPE SPECIFIC TRAINING / OPERATOR CONVERSION TRAINING

Note: *Detailed training requirements of each topic found in Table 2 can be referred to Chapter 6 of this document.*

4.2.2 Aircraft Type Specific Training/Operator Conversion Training should emphasize on the following:

(a) Installed emergency locator transmitter;

(b) Normal procedures and the related hands-on and/or simulated exercises;

(c) Abnormal and emergency procedures and the related hands-on and/or simulated exercises;

(d) Design-related elements that may impact on normal and/or emergency procedures (stairs, smoke curtain, non-forward-facing passenger seats (if applicable), cargo areas if accessible from the passenger compartment during flight (if applicable), etc.) This training and associated checking shall be accomplished through classroom instruction, CBT (if applicable) as well as hands-on and simulated exercises with a representative training device capable of reproducing the appropriate environment/equipment characteristics, or on an actual aircraft; and

(e) This training shall be completed before being first assigned to operate as a cabin crew member on an aircraft type.

4.3 Recurrent Training

4.3.1 Recurrent training is conducted annually to ensure the maintenance of competencies, knowledge and skills through a series of theoretical and practical training, hands-on exercises, written exam, etc. relevant to each aircraft type on which the ground instructor will be imparting training.

4.3.2 The recurrent training is mandatory for all cabin crew within a period of 12 consecutive months; and for a cabin crew who have been absent from active flying duties for more than 3 months up to 12 months.

4.3.3 The recurrent training validity is 12 months. If carried out in 2 months preceding the expiry, the subsequent validity will be 12 months from the original expiry.

4.3.4 The training shall include the following elements in the following table as a minimum, as applicable to the particular aircraft:

TABLE 3: CABIN CREW RECURRENT TRAINING
Minimum Topics to Cover
The Annual Emergency Survival Test, which shall include but not limited to; Human Performance and reinforcement of Crew Resource Management; Aspects of emergency and survival appropriate to the aircraft type; Crowd control techniques; Pilot incapacitation; Location and use of emergency survival equipment; Appropriate drills and procedures; and First aid. Periodic Practice Once annually, cabin crew are to demonstrate their competence in carrying out the following practical drills: Use of emergency and lifesaving equipment required to be carried; Use of each type extinguishers and protective breathing equipment carried on board the aircraft(s) to be operated; Touch drills and the use of emergency exits in normal and emergency mode; First aid, practical rescue breathing and Cardio Pulmonary Resuscitation; Use of first aid and universal precaution kits. Once every 36-months period, cabin crew are to demonstrate their competence in carrying out the following practical drills: Use of emergency evacuation slide representative to the highest of the A/C main deck; Boarding a slide raft/life raft with a life jacket representative to the actual equipment on board the aircraft(s) to be operated. Security recurrent training; and Dangerous goods recurrent training and testing. Safety Management System Training;

Table 3 CABIN CREW RECURRENT TRAINING

Note: *Detailed training requirements of each topic found in Table 3 can be referred to Chapter 6 of this document.*

4.4 Differences Training

4.4.1 Cabin crew differences training and the associated checking shall be accomplished through classroom instruction, CBT (if applicable), as well as hands-on and simulated exercises with a representative training device capable of reproducing the appropriate environment/equipment characteristics, or on an actual aircraft.

4.4.2 The programme and syllabus of the differences training should take into account the cabin crew member's previous training as documented in his/her training records.

4.4.3 When developing the training programme and syllabus for differences training, the operator should consider the non-mandatory (recommendations) elements for the relevant type that are provided in the data established in accordance with regulations.

4.4.4 Aircraft differences training shall be conducted according to a syllabus and include the use of relevant equipment and emergency procedures and practice on a representative training device or on the actual aircraft.

4.4.5 The training shall include the following elements in the following table as a minimum, as applicable to the particular aircraft:

TABLE 4: CABIN CREW DIFFERENCES TRAINING
Minimum Topics to Cover
Doors/exits (type, number, location and operation);
Assisting evacuation means (slide, slide-raft, life raft, rope, etc.);
Safety and emergency equipment, including location and operation;
Aircraft systems relevant to crew duties and responsibilities;
Normal procedures and the related hands-on and/or simulated exercises;
Abnormal and emergency procedures and the related hands-on and/or simulated exercises; and
Designed-related elements that may impact on normal and/or emergency procedures (stairs, smoke curtain, social areas, non-forward-facing passenger seats (if applicable), cargo areas if accessible from the passenger compartment during flight (if applicable), etc

Table 4 CABIN CREW DIFFERENCES TRAINING

Note: *Detailed training requirements of differences training can be referred to Chapter 6 of this document.*

4.5 In-Charge Cabin Crew Training and Its Recurrent

4.5.1 The in-charge cabin crew member (also referred to as cabin leader, lead cabin crew member, onboard leader, senior cabin crew member, etc.) is a cabin crew leader who has overall responsibility for the conduct and coordination of cabin procedures applicable during normal operations, abnormal and emergency situations for flights operated with more than one cabin crew member.

4.5.2 In multi-cabin crew operations, an in-charge cabin crew member shall be designated by the operator. The in-charge cabin crew member has the responsibility to the flight crew for coordination of normal, abnormal and emergency procedures specified in the operations manual and for managing situations with the other cabin crew members. Prior to being designated as an in-charge cabin crewmember, the following criteria should be met:

(a) Minimum experience considered acceptable to CAAT; and

(b) Successful completion of the operator's in-charge cabin crew member training (as required by CAAT).

Note: *Start-up operators should establish alternative minimum experience requirements acceptable to CAAT.*

4.5.3 Operators are to ensure that in-charge cabin crew members maintain the required skills and remain proficient on the duties and responsibilities specific to that role. In order to achieve this goal, cabin crew members designated as in-charge cabin crew shall receive recurrent training. The delivery methods used may vary. An operator may develop a standalone in-charge cabin crew member recurrent training programme or embed aspects of this programme as part of its recurrent training programme.

4.5.4 If the operator chooses to develop a standalone recurrent training programme specific for in-charge cabin crew members, this should be conducted in addition to the regular annual recurrent training required for all cabin crew. It is required that this training programme be provided annually.

4.5.5 In-charge cabin crew training shall include the following elements in the following table as a minimum:

TABLE 5: IN-CHARGE CABIN CREW TRAINING
Minimum Topics to Cover in Initial In-Charge Cabin Crew Training
Pre-flight briefing; Communication and cooperation with the crew; Review of legal and operator's requirements; Accident and incident reporting systems and requirements; Human factors and Crew Resource Management; Flight and duty time limitations and rest requirements; Safety on the ramp; Aircraft diversion involving emergency first aid cases; Minimum Equipment List; Aviation Security; Use of Automated External Defibrillators (if carried); and Leadership skills.
Minimum Topics to Cover in Recurrent In-Charge Cabin Crew Training
All topics covered during the initial in-charge cabin crew training; and Management of emergency scenarios.

Table 5 IN-CHARGE CABIN CREW TRAINING

Note: *Detailed training requirements of each topic found in Table 5 can be referred to Chapter 6 of this document.*

APPENDIX F

GUIDELINES FOR CABIN CREW MANUAL

1 INTRODUCTION

The Cabin Crew Manual itemizes the minimum standard for content which an air operator must include in the publication of a Cabin Crew Manual. When developing a Cabin Crew Manual for regulatory acceptance, the air operator must extract the components from the standard which are applicable to their operation.

2 APPLICATION

The Cabin Crew Manual shall be divided into two parts:

PART 1

This part establishes the safety and emergency procedures, and information which must be contained in the Cabin Crew Manual, issued to each cabin crew, readily available for reference during all phases of flight (pre-flight, in-flight and post-flight) and is accepted by the Authority.

PART 2

This part establishes additional information which is not required to be readily available for reference during flight. It must be issued to each cabin crew and is accepted by the Authority.

Notwithstanding the above an air operator may choose to issue both parts in one publication. Each part shall be kept up-to-date by the cabin crew and contain at least the following:

(a) A table of contents;

(b) A list of effective pages;

(c) Amending procedures;

(d) Amendment control page;

(e) Preamble;

(f) The date of the last amendment to each page specified on that page; and

(g) A reference to each applicable regulatory requirement.

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3 CABIN CREW MANUAL STRUCTURE

The operators shall include, but not limited to, the following information on safety and emergency procedures in their Cabin Crew Manual. Such information may be organized in a different order than that presented in this Appendix. However, the operators must provide a detailed index/cross reference

3.1 PART 1 SECTION 1: SAFETY PROCEDURES

3.1.1 The Civil Aviation Authority of Thailand - Roles/functions of Inspectors

(a) Inspector identification;

(b) Air operator procedures - Carriage of Inspectors; and

(c) Authority of Inspectors.

3.1.2 Cabin crew responsibility in order to follow and enforce company policies/procedures and regulatory requirements.

3.1.3 Cabin crew responsibility in order to communicate any safety concerns they may have or that may be communicated to them by a passenger to the Captain.

3.1.4 Cabin Crew Manual

(a) Revision procedures;

(b) Air operator procedures for accessibility; and

(c) Responsibility to update personal copy(s) of manual(s).

3.1.5 Air operators' policy on cabin crew consumption of alcohol/medication/drugs

3.1.6 Flight Deck

(a) Authority of the Pilot-in-Command;

(b) Chain of command while on duty; and

(c) Safe communication practices with the flight deck.

3.1.7 Admittance to the Flight Deck

(a) Pilot-in-Command's authority for admittance to the flight deck; and

(b) Policies and procedures regarding admittance to flight deck and occupancy of flight deck seats.

3.1.8 Sterile Flight Deck

(a) Definition and Procedures;

(b) Phases of flight; and

(c) Emergency communication during these periods.

3.1.9 Flight Deck Service

(a) Safety guidelines; and

(b) Procedures for crew meals.

3.1.10 Security Pass

(a) Policies/procedures regarding use/wearing of the security pass; and

(b) Procedures on the loss of security pass.

3.1.11 Crew Complement

(a) Minimum cabin crew on each aircraft type;

(b) Crew position assignment priorities on each aircraft type; and

(c) Operations Specification for exceptional circumstances.

3.1.12 Crew Pre-Flight Safety Briefings

(a) Procedures for:

(i) When and by whom to be conducted; and

(ii) Requirements, content and format.

3.1.13 Pre-Flight Serviceability Checks of Safety and Emergency Equipment:

(a) When to complete the checks:

(i) Change of crew;

(ii) Change of aircraft; and

(iii) Continuous duty periods when all crews away from the aircraft.

(b) Who to perform checks, information on associated paperwork and checklists.

(c) During the pre-flight checks, the operator shall ensure the following check:

(i) Existing;

(ii) Correct location;

(iii) Correct quantity;

(iv) Correct type;

(v) Accessibility;

(vi) Serviceability;

(vii) Condition; and

(viii) Sealed (if applicable).

(d) What to do if equipment is:

(i) Unserviceable;

(ii) Missing; and

(iii) Replaced.

3.1.14 Special Categories of Passengers (SCPs)

(a) Definition and description of passengers deemed "Special Categories of Passengers" (SCPs);

(b) Restrictions in seating and numbers to be carried on each aircraft type;

(c) Procedures for special briefing prior to departure to meet the particular requirements of each individual passenger who may require special assistance, including content and methodology;

(d) Seat back recline procedures; and

(e) Procedures for carriage of stretcher(s) and incubator(s) (if applicable).

3.1.15 Passenger Safety Announcements

(a) Pre-flight passenger safety announcement and demonstration:

(i) Identify the requirement for prior to departure; and

(ii) Identify the content of the followings, but not limited to:

(1) Carry-on baggage regulations;

(2) Use of seatbelts: fastening, releasing, tightening;

(3) Correct stowage of passenger's seat features (e.g. tray tables, armrests, TV monitors, and etc.);

(4) Location of emergency exits and exit location signs;

(5) Seatbelt and no smoking signs;

(6) Oxygen mask locations, donning and operation;

(7) Life jacket location, removal from stowage, donning and operation;

(8) Location, operation, instructions for other floatation equipment;

(9) Emergency lighting/floor proximity lighting system;

(10) Passengers advised that they may draw any concerns to the attention of a safety announcement and demonstration;

(11) Passenger operated electronic devices; and

(12) Passenger safety cards.

(b) Identify the content of the after-take-off briefing including but not limited to:

(i) Smoking regulations; and

(ii) Recommending the use of seatbelt in-flight.

(c) Identify the requirement for and the content of briefings regarding turbulence:

(i) Directing the use of seatbelts and/or harnesses, when provided; and

(ii) Stowing carry-on baggage.

(d) Identify the content of the pre-landing briefing including but not limited to:

(i) Carry-on baggage stowage;

(ii) Seatbelt requirements;

(iii) The use and stowage of PEDs; and

(e) Correct stowage of passenger's seat features (e.g. tray tables, armrests, TV monitors, and etc.);

(f) Identify the content of the after-landing briefing including but not limited to:

(i) Remaining seated with seatbelts fastened;

(ii) Carry-on baggage requirements;

(iii) Smoking restrictions; and

(iv) Safe movement away from aircraft.

3.1.16 Carriage of Guide and Service Animal(s) Procedures (if applicable).

3.1.17 Carriage of Animals in the Cabin Procedures (if applicable).

3.1.18 Child Restraint Systems

(a) Terms of acceptance;

(b) Maximum weight, height of occupants;

(c) Procedures for the carriage of the seat;

(d) Labelling requirements;

(e) Seating locations restrictions; and

(f) Special briefing and handling requirements.

3.1.19 Infant and Child Seating Restrictions

(a) Regulatory Requirements; and

(b) Procedures

3.1.20 Exit Row Seating Restrictions and Special Briefing Requirements.

3.1.21 Prisoners/Escorts

(a) Transportation procedures; and

(b) Restrictions.

3.1.22 Cabin Supervision

(a) Definition; and

(b) Procedures on station stops, during boarding and deplaning of passengers.

3.1.23 Carriage of Weapons Procedures

3.1.24 Passenger Head Count/Weight and Balance Procedures

3.1.25 Door Procedures/Signals (Normal Operation)

(a) Closing of doors;

(b) Arming/Disarming of doors; and

(c) Opening of doors.

3.1.26 Inoperative Doors

(a) MEL relief given to carriers when a door/slide is inoperative, including but not limited to:

(i) Number of doors/slides that may be inoperative for each aircraft type;

(ii) Passenger load and seating restrictions for each aircraft type;

(iii) Cabin crew duties and manning of stations for take-off and landing when this condition occurs; and

(iv) Signage, placarding, and announcement to passengers regarding inoperative door/slide.

3.1.27 Ground Service

(a) Regulatory requirements; and

(b) Procedures.

3.1.28 Duties Prior to/During Pushback/Taxi/Preparation for Take-off

(a) Regulatory requirements and procedures; and

(b) Safety duties only.

3.1.29 Pre-Take-off/Pre-Landing Checks, Cabin/Galley Secure

(a) Procedures for:

(i) Passenger;

(ii) Cabin;

(iii) Galley; and

(iv) Lavatory.

(b) Air operator's procedures to ensure that cabin/galley duties are complete and cabin crew seated and secured with their seat belts and safety harnesses (if applicable) prior to commencement of the take-off roll and prior to landing.

3.1.30 Passenger Medical Oxygen

(a) Procedures for acceptance of passengers and equipment; and

(b) Stowage/securing means/devices for take-off, landing, and in-flight turbulence.

3.1.31 Seat Belts/No Smoking Signs

(a) Cabin crew duties when a seat belt/no smoking sign is changed (ON/OFF)

3.1.32 Seat Belts

(a) Requirement for seat belts;

(b) Passenger requirement for use;

(c) Crew requirement for use; and

(d) Seat belt extensions.

3.1.33 Smoking

(a) Non-Smokers Health Act;

(b) Regulatory requirements including enforcement; and

(c) Air operator procedures.

3.1.34 Use of Portable Electronic Devices (PED)

(a) Procedures for;

(i) Items permitted without restriction;

(ii) Items permitted during cruise; and

(iii) Items prohibited.

(b) Procedures when interference to aircraft systems is experienced; and

(c) Use of devices on open ramps and during boarding/deplaning.

3.1.35 Turbulence

(a) Definitions;

(b) Cabin crew duties/responsibilities for each category;

(c) Service;

(d) Communication between crew (flight deck, cabin, etc.); and

(e) In-charge cabin crew responsibilities.

3.1.36 Signals for Take-off/Landing Imminent and Associated Procedures.

3.1.37 Silent Review

(a) Description;

(b) Phases of flight when required; and

(c) Content.

3.1.38 Cabin Crew Seat/Station

(a) When Cabin crew must occupy seat;

(b) Requirement to occupy assigned station/seat;

(c) Persons authorized to occupy; and

(d) Final safety checks to confirm that the cabin is clear.

3.1.39 Unserviceable Cabin Crew Seat (Aircraft MEL)

(a) Conditions which constitute an unserviceable cabin crew seat;

(b) Procedures for unserviceable cabin crew seat;

(i) Alternate seating;

(ii) Alternate procedures for communication, evacuation; and

(iii) Conditions for occupying alternate seat.

3.1.40 Cabin Baggage

(a) Regulatory requirements;

(b) Procedures for acceptance;

(c) Approved stowage;

(d) Restricted areas;

(e) Procedures for management of excess baggage; and

(f) Crew carry-on baggage procedures.

3.1.41 Cargo in Passenger Seats/Cabin

(a) Regulatory requirements;

(b) Equipment used to meet compliance; and

(c) Procedures for acceptance and securing.

3.1.42 Galley/Service Equipment

(a) Safety procedures; and

(b) Use of galley equipment/service during turbulence.

3.1.43 Duties after Landing/Taxi-in

3.1.44 Fueling with Passengers on Board

(a) Regulatory requirements; and

(b) Procedures and conditions.

3.1.45 Cabin Checks/Lavatory Checks During Flight

3.1.46 Liquor Laws

(a) Regulations;

(b) Air operator responsibilities;

(c) Cabin Crew responsibilities; and

(d) Enforcement.

3.1.47 Unruly, Unmanageable and Impaired Passengers

(a) Cabin crew procedures on acceptance/refusal.

3.1.48 Transportation of Dangerous Goods

(a) Definition;

(i) Dangerous goods accepted;

(ii) Dangerous goods forbidden; and

(iii) Dangerous goods excepted.

(b) 9 classes of dangerous goods;

(c) Packaging labels examples;

(d) List of dangerous goods excepted:

(i) On the aircraft;

(ii) On person;

(iii) Carry-on baggage; and

(iv) Carry-on or checked baggage.

(e) Dangerous goods spill/leak procedures

3.1.49 Cabin Crew Safety Responsibilities/Duties of Each Position (Station) on Each Aircraft Type.

3.1.50 Incident Reporting Procedures

3.1.51 Aircraft Surface Contamination Procedures

(a) Description of surface contamination;

(b) Description of "Clean Aircraft Concept";

(c) Cabin crew responsibilities;

(d) Crew communication;

(e) De-icing/anti-icing;

(f) Definition and application;

(g) Cabin crew responsibility to monitor wing surface conditions for contamination in conditions of adverse weather; and

(h) Cabin crew responsibility to report to the pilot-in-command, any time prior to the takeoff roll, any concerns conveyed by a passenger relating to wing contamination.

3.1.52 Safety on the Ramp

3.1.53 Announcements – General

(a) Air operator language procedures;

(b) When announcements must be made;

(c) Demonstration positions in cabin on each aircraft;

(d) Content/methodology of demonstration; and

(e) Cabin crew duties during pre-recorded announcements/demonstrations.

3.1.54 Rejected (Aborted) Take-off

(a) Description; and

(b) Cabin crew procedures.

3.1.55 Missed Approach

(a) Description; and

(b) Cabin crew procedures.

3.2 PART 1 SECTION 2: EMERGENCY PROCEDURES

3.2.1 Rapid Decompression

(a) Causes;

(b) Physical signs;

(c) Physiological symptoms; and

(d) Procedures during and following rapid decompression/emergency decent.

3.2.2 Cabin Pressurization Problems

(a) Causes;

(b) Signs and symptoms; and

(c) Procedures.

3.2.3 Fire Prevention

(a) Enforcement of no-smoking policies;

(b) Monitoring of lavatory and cabin at specific intervals during flight;

(c) Responding to smoke detector activation; and

(d) Investigation of unusual smoke/fumes/odors in the cabin.

3.2.4 Fire Fighting

(a) Use of various extinguishers on specific classes of fires;

(b) Technique of searching for fires;

(c) Communication procedures;

(d) Fire fighting primary and back-up responsibilities;

(e) Safe practices in fighting fires;

(f) Management of specific types of fires;

(i) Fire on a person;

(ii) Oven/galley fire;

(iii) Hidden fires/inaccessible fires;

(iv) Cargo compartment fires;

(v) Electrical fire;

(vi) Lavatory fire;

(vii) Waste bin fire;

(viii) Seat fire;

(ix) Fire/smoke in flight deck;

(x) Overhead bin fire; and

(xi) Cabin baggage fire.

(g) Post fire procedures.

3.2.5 Flash Fire/Flashover Description

3.2.6 Engine Fires/APU Fires/Torching

(a) Description; and

(b) Procedures.

3.2.7 Fuel Spills/Fires

(a) Description; and

(b) Procedures.

3.2.8 Gate/Apron Emergencies

(a) Description; and

(b) Procedures.

3.2.9 PTV Mated to the Aircraft Emergencies Procedures

3.2.10 Cabin Smoke/Smoke Removal

(a) Description; and

(b) Procedures.

3.2.11 Fuel Fumes in the Cabin

(a) Description; and

(b) Procedures.

3.2.12 Fuel Dumping

(a) Aircraft in fleet that are capable of fuel dumping;

(b) Description; and

(c) Procedures.

3.2.13 Incapacitated Flight Deck Crew Member Procedures

3.2.14 Incapacitated Cabin Crew Procedures

3.2.15 Passenger Brace Positions for Impact

(a) Difference seating configurations and orientation;

(b) Passengers with arm held infants; and

(c) Pregnant passengers.

3.2.16 Cabin Crew Brace Positions

(a) Forward facing seat;

(b) Aft facing seat;

(c) Passenger seat; and

(d) Procedures regarding brace position for each take-off/landing.

3.2.17 Brace Commands

(a) Unprepared emergency landing; and

(b) Prepared emergency landing.

3.2.18 Emergency Evacuation Commands

(a) General

(i) Purpose;

(ii) Technique;

(iii) Correct use; and

(iv) Pacing (speed in making emergency announcements).

3.2.19 Emergency Evacuation Commands - Applications

(a) General commands for land, inadvertent water contact and ditching;

(b) Blocked/jammed exit commands; and

(c) ABP commands.

3.2.20 Notification of an Emergency

(a) Flight deck-to-cabin

(i) Communication; and

(ii) Procedures.

(b) Cabin-to-flight deck

(i) Communication;

(ii) Procedures; and

(iii) Critical phases of flight.

(c) Cabin Crew-to-Cabin Crew communication procedure.

3.2.21 Brace Signals

(a) Descriptions;

(b) Primary signal;

(c) Alternate signal; and

(d) Crew member responsibilities at the brace signal.

3.2.22 Evacuations vs. Rapid Disembarkation

(a) Descriptions;

(b) Conditions under which evacuation would be necessary; and

(c) Conditions under which disembarkation would be necessary.

3.2.23 Evacuations

(a) General - Likelihood and recognition of unprepared emergencies for take-off/landing and alertness.

(b) Possible evacuation scenarios

(i) Land; at airport, away from airport;

(ii) Inadvertent water; at airport, away from airport;

(iii) Tidal flats or swamps; and

(iv) Ditching.

(c) Initiation

(i) Flight deck and cabin crew.

(d) When/how evacuation is initiated

(e) Crew responsibilities

(i) Each aircraft;

(ii) Equipment, stations, exits (primary/secondary); and

(iii) Land and water.

3.2.24 Evacuation Signals

(a) Descriptions;

(b) Primary signal/variations;

(c) Alternate signal/variations;

(d) Crew member responsibilities at the evacuation signal; and

(e) Evacuation cancellation.

3.2.25 Prepared Emergency Landing/Ditching

(a) Procedures according the operator requirement

Note: *The operator must develop procedures in a format that crew members may use when preparing for an emergency landing or ditching that will serve as a checklist. The selected format must include responsibilities of each crew member for the purpose of cabin, passenger, galley and self-preparation. All passenger advisory announcements must be included.*

3.2.26 Exit Priorities on Land/Ditching

3.2.27 Post-Evacuation and Survival

(a) Responsibilities of crew members (e.g. grouping passengers, first aid, etc.);

(b) Survival priorities (e.g. shelter, first aid, water, food, etc.);

(c) Hazards inherent in different environments as applicable to the air carrier's operation (e.g. sea, desert, jungle, wilderness, and arctic);

(d) Identify on board equipment and supplies that can enhance survival;

(e) Survival equipment; and

(f) Signaling and recovery techniques.

Note: *Most accidents occur during take-off and landing. In keeping with the principles of risk management, an air operator must tailor their post-evacuation and survival techniques to the environment in with their stations are located. For example, an air operator that operates in and out of an arctic station would address post evacuation procedures relative to arctic conditions. However, an air operator that overflies an arctic station does not require arctic survival.*

3.3 PART 1 SECTION 3: AIRCRAFT OPERATIONS

3.3.1 Aircraft Exits

The operator must identify and describe the location, features and operation of each of the exits on the aircraft in both normal and emergency mode.

3.3.2 Normal Operation

(a) Who opens/closes specific doors;

(b) Signals/conditions to open/close;

(c) Precautions and exit assessment;

(d) Opening/closing procedures; and

(e) Crew communications.

3.3.3 Arming/Disarming Procedures

(a) Who arms/disarms specific doors;

(b) When to arm/disarm;

(c) Arm/disarm checks;

(d) Precautions;

(e) Abnormalities/corrective actions; and

(f) Crew communications.

3.3.4 Emergency Operation

(a) Signals to open;

(b) Exit assessment/conditions/attitude of aircraft;

(c) Opening/alternate opening procedures;

(d) Precautions;

(e) Slide/raft (ramp) deployment, inflation & use;

(f) Slide/raft (ramp) failure;

(g) Escape tape, ropes location and use; and

(h) Crew communications.

3.3.5 Air Stairs/Ventral Stairs

(a) Controls;

(b) Operations (normal & emergency);

(c) Operational precautions; and

(d) Crew communications.

3.3.6 Flight Deck Escape Routes

(a) Location(s), operation(s) and method(s) of egress; and

(b) Conditions for use.

3.3.7 Communications Systems

(a) Public address system, interphone system and emergency operation procedures

Note: *Where applicable, identify procedures to follow when equipment is unserviceable (i.e. MEL relief/alternatives) and procedures to follow if systems become unserviceable while airborne.*

3.3.8 Electrical Systems

(a) Galley power shut off location(s) and procedures;

(b) Galley appliance overheat/malfunctions;

(c) Circuit breakers;

(i) Location(s);

(ii) Purpose;

(iii) Description; and

(iv) Reset procedures.

(d) Emergency lighting;

(i) Location(s)/operation of controls for activation; and

(ii) Location(s)/operation - portable lighting units.

(e) Oxygen systems.

(i) Location(s)/operation/manual release-cabin; galleys; lavatories; and

(ii) Location(s)/operation - flight deck oxygen masks.

3.3.9 Miscellaneous

(a) Cabin crew seat/stations- locations and cabin positions in all configurations for pre-flight passenger safety demonstrations and emergency landing briefings;

(b) Flight crew seats - two-person flight deck description of seats, controls and restraint system;

(c) Passenger seat unserviceability procedures;

(d) Stowage area unserviceability procedures;

(e) Water supply, sinks, drains (galleys/lavatories);

(i) Location and description/operation of shut-off valves; and

(ii) Precautions for using sinks to avoid scalding ground personnel.

(f) Galley;

(i) Stowages;

(ii) Circuit breakers;

(iii) Latching/Locking mechanisms;

(iv) Service carts and brakes; and

(v) Waste bin flap

(g) Lifts/elevators (if applicable);

(i) Abnormal and emergency operation;

(ii) Control override procedures; and

(iii) Escape procedures.

(h) Curtains and partitions procedures for take-off, landing and turbulence management;

(i) Lavatories;

(i) Door locking mechanisms (external);

(ii) Emergency entry procedures;

(iii) Positioning and locking of lavatory door for take-off and landing;

(iv) Electrical outlets;

(v) Location and operation of water heater units;

(vi) Location and operation of "waste receptacle" fire extinguisher;

(vii) Location and operation of smoke detector units;

(viii) Location and condition of temperature indicator placards (if applicable); and

(ix) Location and condition of waste container and waste bin flaps.

(j) Emergency equipment locations diagram;

(k) Fueling - emergency exits;

(l) Cabin crew seating priority; and

(m) Exit row seating requirements.

3.3.10 Unique Features

Identify any features, procedures and/or equipment unique or different within the aircraft type in the operator's fleet.

(a) Describe each of the differences, their impact on the carrier's standard operating procedures and the importance to flight safety of crew members being familiar with them;

(b) Describe the impact of these differences on crew communication and crew coordination procedures and ways to ensure crew members are familiar with these differences prior to the flight, i.e.: crew briefing, familiarization walk-throughs; and

(c) Definition and description and operational procedures of

(i) Blow-out panels;

(ii) Flight deck door; and

(iii) Smoke barrier.

3.4 PART 1 SECTION 4: SECURITY PROCEDURES

3.4.1 Security Training

Air Operator Security Training Programme shall at minimum include the following elements:

(a) Determination of the seriousness of any occurrence;

(b) Crew communication and coordination;

(c) Appropriate self-defense responses;

(d) Use of non-lethal protective devices assigned to crew members whose use is authorized by the operator;

(e) Understanding of behavior of terrorists so as to facilitate the ability of cabin crew to cope with hijacker's behavior and passenger responses;

(f) Live situational training exercises regarding various threat conditions;

(g) Flight crew compartment procedures to protect the airplane;

(h) Airplane search procedures and guidance on least-risk bomb locations where practicable; and

(i) Post-flight concerns for the crew.

Note: *Further details on Security Training Programme, refer to Chapter 4, paragraph 17 and National Civil Aviation Security Training Programme.*

3.5 PART 1 SECTION 5: SAFETY AND EMERGENCY EQUIPMENT

3.5.1 Minimum Equipment List

(a) General function;

(b) Who uses it; and

(c) Location

3.5.2 Log Book/Entries

(a) When used

(i) Who makes entries;

(ii) What should be entered; and

(iii) What to do when entries have been made.

3.5.3 Specific Equipment

For each piece of safety and emergency equipment carried, identify the following:

(a) General description;

(b) Correct name/terminology;

(c) Purpose;

(d) Components;

(e) Location(s);

(f) Pre-flight serviceability check(s);

(g) Operations procedures (primary/alternate, including removal from stowage);

(h) Operational limitations (duration/range/temperature/minimum PSI's etc.);

(i) Operation under adverse conditions;

(j) Operational precautions;

(k) Precautions for use; and

(l) Post-use procedures (including relocation of equipment, if applicable).

3.5.4 Location of Equipment of Each Aircraft

3.6 PART 1 SECTION 6: FIRST AID

The First Aid section shall include components 3.6.1 to 3.6.12 or the air operator may have these components in a separate document, provided the document is:

(a) Referenced in the Cabin Crew Manual;

(b) Issued to each cabin crew;

(c) Readily available for reference during all phases of flight (pre-flight, in-flight and post-flight); and

(d) Approved by the Authority.

3.6.1 Medical Emergencies

Procedures regarding management of in-flight medical emergency (e.g. emergency scene management)

3.6.2 Signs, Symptoms and Management of:

(a) In-flight medical emergencies and incidents;

(b) Shock, unconsciousness and fainting;

(c) Artificial respiration/ CPR - adult, child and infant;

(d) Choking - adult, child and infant;

(e) Cardiovascular emergencies;

(f) Wounds and bleeding;

(g) Fractures, dislocations and sprains;

(h) Head/spinal injuries;

(i) Burns;

(j) Asthma, allergies and poisons;

(k) Medical conditions;

(l) Altitude related conditions;

(m) Hemorrhage;

(n) Heart attacks;

(o) Stroke, epilepsy, diabetes;

(p) Use of therapeutic oxygen and oxygen sets;

(q) Emergency childbirth;

(r) Stress reactions and allergic reactions;

(s) Air sickness;

(t) Transmissible, quarantinable, and endemic diseases;

(u) Personal hygiene; and

(v) Poisoning, effect of drugs and intoxication.

3.6.3 Time of Useful Consciousness

(a) Description; and

(b) Time frames.

3.6.4 Cabin Crew Safety

(a) Cabin crew to be seated during critical phases of flight even when a medical emergency may be in progress on board.

3.6.5 Cabin Crew Responsibilities

(a) Specific air operator policies and procedures regarding such items as administration of medication, use of equipment, calling for a physician, notification of the flight deck, etc; and

(b) Necessary information required to ensure that appropriate medical assistance is available upon arrival.

3.6.6 Personal Protection

(a) Procedures regarding prevention of cabin crew injury (e.g. syringes, needles); and

(b) Hygienic protocol to ensure the safety of cabin crew (e.g. latex gloves, face masks).

3.6.7 Carriage of Passengers with Contagious Diseases

(a) Procedures;

(b) Equipment; and

(c) Precautions.

3.6.8 Suspected Death Procedures

3.6.9 Other First Aid Equipment Use and Precautions

3.6.10 Aircraft First Aid Kit(s) and Emergency Medical Kits Contents and Use

3.6.11 Reporting Medical Incidents Procedures

3.6.12 Control of Infectious Diseases

The operator shall ensure that cabin crew/flight crew are provided with appropriate knowledge and training of communicable disease to cover but not limited to the following;

(a) Observation of symptom and signs

(b) Handling procedure

(i) Management;

(ii) Use of protective devices; and

(iii) Isolation of the suspected passenger.

(c) Communication

(i) Reporting process;

(ii) Cabin to flight deck;

(iii) Flight deck to ATC and etc.;

(iv) Documentation;

(v) General declaration form; and

(vi) Cabin report form.

3.7 PART 2 SECTION 1: COMPANY/ DEPARTMENTAL ORGANIZATION

3.7.1 In-Flight Department

An air operator shall include:

(a) In-flight department name, i.e.: cabin services, in-flight services, on board services, etc.;

(b) An organizational chart showing the reporting structure of the in-flight department to the entire organization, as well as the reporting structure within the in-flight department; and

(c) A job description for each operational individual i.e.: cabin crew manager, in-charge cabin crew member, cabin crew; and cabin crew competency.

3.8 PART 2 SECTION 2: SAFETY PROCEDURES

3.8.1 Explanation of Regulatory Requirements

(a) CAAT Regulations; and

(b) Associated standards.

3.8.2 Air operator policy and procedures on:

(a) Blood donation;

(b) Scuba diving;

(c) Effects of alcohol/drugs on crew members while on duty/at altitude;

(d) Security pass/company I.D. and air operator;

(e) Deportees; and

(f) Cabin lighting for various phases of flight during day and night operations.

3.9 PART 2 SECTION 3: EMERGENCY PROCEDURES

3.9.1 Introduction on the purpose of procedures

3.9.2 Leadership

(a) Description/importance;

(b) Passenger negative panic; and

(c) Passenger positive panic.

3.9.3 Pressurization

(a) Identify how cabin pressure is maintained;

(b) Identify how cabin pressure is monitored; and

(c) Compartments of aircraft that are pressurized.

3.10 PART 2 SECTION 4: AIRCRAFT SPECIFIC

3.10.1 Communications Systems - Location(s); Pre-Flight Service and Equipment Checks; Operations; for each of:

(a) Public address system;

(b) Interphone system;

(c) Passenger call system;

(d) Automated announcement system; and

(e) On board entertainment system.

3.10.2 Electrical Systems - Location(s); Pre-Flight Service and Equipment Checks; Operations; for each of:

(a) Lighting

(i) Cabin ceiling lighting;

(ii) Cabin sidewall lighting;

(iii) Entry lighting;

(iv) Work station lighting;

(v) Galley lighting;

(vi) Flight deck entry-way lighting;

(vii) Lighting in miscellaneous stowage compartments;

(1) Threshold, cross-aisle lighting; and

(2) Electrically operated coat racks/stowage units.

(b) Ovens, water boilers, coffee makers and any other galley appliances

(i) Locations, descriptions;

(ii) Restraint systems;

(iii) Operations; and

(iv) Procedures in case of overheat and/or malfunctions.

(c) Refrigeration units

(i) Locations, descriptions, operations;

(ii) Procedures relating to overheat/malfunctions; and

(iii) Restraint systems.

(d) Electrical control panels

(i) Locations;

(ii) Descriptions; and

(iii) Operations.

(e) Seatbelt and no smoking signs

(f) Cabin indications of use/change

(g) Heating/air conditioning

(i) Components;

(ii) Controls; and

(iii) Operations.

3.10.3 Miscellaneous

(a) Cabin configuration

(i) Seating configuration/classes of service;

(ii) Location of galleys; and

(iii) Location of exits.

(b) Cabin crew seats/stations

(i) Locations;

(ii) Description of seats and controls;

(iii) Restraint system;

(iv) Operation of seat; and

(v) Materials condition.

(c) Passenger seats

(i) Description of seats and controls;

(ii) Restraint system;

(iii) Special features - footrest, moveable armrests, stowage, etc.;

(iv) Unserviceability procedures;

(v) Good condition; and

(vi) Not blocking exits.

(d) Stowage areas

(i) Location(s);

(ii) Controls/operation if applicable;

(iii) Maximum loading;

(iv) Restraint(s);

(v) Access to equipment; and

(vi) Crew baggage.

(e) Water supply, sinks, drains

(i) Location and capacity of potable water supply; and

(ii) Precautions.

(f) Lifts/elevators

(i) Location;

(ii) Controls;

(iii) Maximum loading; and

(iv) Operation.

(g) Curtains and partitions

(i) Locations; and

(ii) Use/restrictions.

(h) Lavatories

(i) Locations; and

(ii) Features.

(i) Signs, Markings and Placards

(i) Certification requirements;

(ii) Characteristics; and

(iii) Content.

(j) Crew rest area (if applicable)

(i) Locations;

(ii) Locking mechanisms;

(iii) Escape hatch;

(iv) Communication system; and

(v) Safety and emergency equipment.

(k) Carpet condition;

(l) Floor panel condition

APPENDIX G

GUIDELINES FOR CREW RESOURCE MANAGEMENT (CRM) TRAINING FOR ALL CREW

1 INTRODUCTION

The Civil Aviation Authority of Thailand (CAAT) requires all applicants for an Air Operator Certificate (AOC) to establish and maintain a training programme for Crew Resource Management (CRM), approved by CAAT, to be completed by all persons before being assigned as a cabin crew member. CRM encompasses a wide range of knowledge, skills and attitudes including communications, situational awareness, problem solving, decision-making, and teamwork. The elements, which comprise CRM, may be seen as a management system which makes optimum use of all available resources (e.g. equipment, procedures and people) to promote safety and enhance the efficiency of flight operations.

CRM is concerned not so much with the technical knowledge and skills required to fly and operate an aircraft but rather with the cognitive and interpersonal skills needed to manage the flight within an organized aviation system. In aviation, as in other walks of life, these skill areas often overlap with each other, and they also overlap with the required technical skills. As a result, CRM training requires an approach which is different from instruction of technical subjects and it is necessary to stipulate requirements for personnel conducting CRM training.

The content of this Appendix is adaptable and operators should tailor it to suit their operations.

PART A GUIDELINES FOR CREW RESOURCE MANAGEMENT (CRM) TRAINING FOR CABIN CREW

A1 APPLICABILITY

This part prescribes the guidelines for Cabin Crew Member CRM training programme development and the requirements for internal appointment of CRM instructor. Approval for the personnel of Scheduled/Non-scheduled Operators, Approved Training Organizations (ATO) and the conditions under which those approvals are exercised.

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A2 GENERAL PRINCIPLES FOR CRM TRAINING FOR CABIN CREW MEMBER

A2.1 To conduct CRM training course, operators shall take into account the followings:

(a) CRM should be the effective utilization of all available resources (e.g. crew members, aircraft systems and supporting facilities) to achieve safe and efficient operation.

(b) The objective of CRM should be to enhance the communication and management skills of the crew members, as well as the importance of effective coordination and two-way communication between all crew members.

(c) Operator's CRM training should reflect the culture of the operator, the scale and scope of the operation together with associated operating procedures and areas of operation that produce particular difficulties.

(d) Accordingly, where required during CRM training, if relevant aircraft type-specific case studies are not available, then other case studies relevant to the scale and scope of the operation should be considered.

(e) Cabin Crew Members CRM training should focus on issues related to cabin crew duties and, therefore, should be different from flight crew CRM training. However, the coordination of the tasks and functions of flight crew and cabin crew should be addressed.

(f) Whenever practicable, combined training should be provided to flight crew and cabin crew, particularly senior cabin crew members. This should include feedback.

(g) Where appropriate, CRM principles should be integrated into relevant parts of cabin crew training.

(h) CRM training should include group discussions and the review of accidents and incidents (case studies).

(i) Whenever it is practicable to do so, relevant parts of CRM training should form part of the training conducted in cabin training devices or in the aircraft.

(j) CRM training courses should be conducted in a structured and realistic manner.

(k) There should be no assessment of CRM skills. Feedback from instructors or members of the group on individual performance should be given during training to the individuals concerned.

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A3 ELIGIBILITIES

A3.1 CRM Instructor

A3.1.1 All personnel conducting CRM training for cabin crew member should be appropriately qualified to integrate elements of CRM into all appropriate training programmes. To be eligible for approval as CRM Instructor, the operator shall ensure that the candidates possess the following qualifications:

(a) Flight Crew/Cabin Crew CRM Instructor

Flight crew/cabin crew CRM instructor shall:

(i) Have suitable current experience of commercial air transport operations as a flight crew member or cabin crew member. If not current, the crew shall have had a minimum experience of 5 years as flight or cabin crew. The experience should be acquired within the last 5 years from the date of application;

(ii) Have received knowledge and instructions on company's safety culture and SOPs;

(iii) Have received instructions on human factors performance limitations (hpl);

(iv) Have completed appropriate crm training course and all cabin crew crm training as required by this appendix;

(v) Have received instruction in training techniques and skills in order to conduct CRM courses; which shall include but not limited to:

(1) The learning process;

(2) Elements of effective teaching;

(3) Student evaluation and testing;

(4) Course development;

(5) Lesson planning;

(6) Classroom training techniques; and

(7) Facilitation skills.

(vi) Have received additional instruction in the fields of group management, group dynamics and personal awareness;

(vii) Have observed one introductory crm course conducted by a qualified crm instructor;

(viii) Be supervised by an appropriately qualified crm instructor when conducting their first CRM training course; and

(ix) Undergo a satisfactory internal assessment by the operator/organization.

(b) Non-crew CRM Instructor

An experienced non-flight crew/non-cabin crew CRM instructor may continue to be a CRM instructor, provided that the provisions specified in (4.1.1) (a) (1) to (4.1.1) (a) (9) are satisfied and that the instructor demonstrates a satisfactory knowledge of the related training content specified in Chapter 6 and Appendix X of this document.

A4 OPERATOR'S ISSUANCES OF APPROVAL FOR CRM INSTRUCTOR

A4.1 On satisfactory completion of requirements specified in Para 4 and 5 above, the candidate shall be required to conduct a sample CRM training session attended by the personnel qualified for his/her assessment and evaluation.

A4.2 Based on satisfactory performance, approval will be issued by the operator, which shall be valid as long as the CRM instructor remains in the employment of the operator/organization.

A5 RECENCY REQUIREMENTS / RE-APPROVAL FOR CRM INSTRUCTOR

A5.1 To continue exercising the functions, a CRM instructor shall have conducted at least one CRM training session in the previous 6 months. If this requirement is not met, then the CRM instructor shall conduct one CRM training session under the supervision of a qualified CRM instructor prior to resuming CRM training.

A5.2 Re-approval in case of change of operator/organization shall require training as per Paragraph 4 of this Appendix followed by approval as in Paragraph 5 above.

A6 THIRD PARTY SERVICE UTILISATION FOR CRM INSTRUCTOR

An operator/organization may utlilize the services of a CRM instructor employed with another operator/organization. This shall require the CRM instructor to be conversant with the SOPs, type of operation and organizational culture.

A7 CRM TRAINING PROGRAMMES FOR CABIN CREW

A7.1 When developing CRM training programme for cabin crew, the operators should take into account an effective liaison between flight crew and cabin crew training departments. Provision should be made to allow, whenever practicable, flight and cabin crew instructors to observe and comment on each other's training. Consideration should be given to creating films of flight crew compartment scenarios for playback to all cabin crew during recurrent training, and to providing the opportunity for cabin crew members, particularly senior cabin crew members, to participate in flight crew training exercises.

A7.2 CRM training for senior cabin crew members

(a) CRM training for senior cabin crew members should be the application of knowledge gained in previous CRM training and operational experience relevant to the specific duties and responsibilities of a senior cabin crew member.

(b) The senior cabin crew member should demonstrate the ability to manage the operation and take appropriate leadership/management decisions.

A7.3 The programme of each CRM training course, its content and the level to be achieved should comply with the relevant elements specified in table 1 below as applicable to the appropriate training course to be completed.

TABLE 1: CABIN CREW CRM TRAINING
Minimum Topics to Cover in Initial CRM Training
General Principles
Human factors in aviation General instructions on CRM principles and objectives; Human performance and limitations;
Relevant to the Individual Cabin Crew Member
Personality awareness, human error and reliability, attitudes and behaviours, self assessment; Stress and stress management; Fatigue and vigilance; Assertiveness; Error prevention and detection; Situation awareness, information acquisition and processing; Shared situation swareness, information acquisition and processing; Workload management; Effective communication and co-ordination between all crew members including the flight crew and inexperienced cabin crew members, cultural differences; Leadership, co-operation, synergy, decision making, delegation; Individual and team responsibilities, decision making and actions; Identification and management of the passenger human factors (crowd control, passenger stress, conflict management, medical factors); Specifics related to aeroplane types (narrow/wide bodies, single, multi deck), flight crew and cabin crew composition and number of passengers (as required);
Relevant to the Operator and the Organisation (Principles)
Company safety culture, SOPs, organizational factors, factors liked to the type of operations; Effective communication and co-ordination with other operational personnel and ground services; Participation in cabin safety incident and accident reporting; and Case based studies (as appropriate).
Minimum Topics to Cover in Recurrent CRM Training

Personality awareness, human error and reliability, attitudes and behaviours, self assessment;
Fatigue and vigilance;
Assertiveness;
Error prevention and detection;
Situation awareness, information acquisition and processing;
Shared situation swareness, information acquisition and processing;
Workload management;
Effective communication and co-ordination between all crew members including the flight crew and inexperienced cabin crew members, cultural differences;
Leadership, co-operation, synergy, decision making, delegation;
Individual and team responsibilities, decision making and actions;
Identification and management of the passenger human factors (crowd control, passenger stress, conflict management, medical factors);
Specifics related to aeroplane types (narrow/wide bodies, single, multi deck), flight crew and cabin crew composition and number of passengers (as required);
Company safety culture, SOPs, organizational factors, factors liked to the type of operations;
Effective communication and co-ordination with other operational personnel and ground services;
Participation in cabin safety incident and accident reporting; and
Case based studies (as appropriate).

Table 1: CABIN CREW CRM TRAINING

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PART B GUIDELINES FOR CREW RESOURCE MANAGEMENT (CRM) TRAINING FOR FLIGHT CREW

B1 GENERAL PRINCIPLES FOR CRM TRAINING FOR FLIGHT CREW

B1.1 CRM should be the effective utilization of all available resources (e.g. crew members, aircraft systems and supporting facilities) to achieve safe and efficient operation.

B1.2 The objective of CRM is to enhance the communication and management skills of the flight crew member concerned. Emphasis is placed on the non-technical knowledge, skills and attitudes of flight crew performance.

B1.3 CRM training should be conducted in the non-operational environment (classroom) and in the operational environment (Flight Simulation Training Device (FSTD or aircraft). Tools such as group discussions, team task analysis, team task simulation and feedback should be used.

B1.4 Whenever possible, classroom training should be conducted in a group session away from the pressures of the usual working environment, so that the opportunity is provided for flight crew members to interact and communicate in an environment conducive to learning.

B1.5 Whenever practicable, parts of the CRM training should be conducted in Flight Simulation Training Devices (FSTDs) that reproduce a realistic operational environment and permit interaction. This includes but is not limited to Line-Oriented Flight Training (LOFT) scenarios.

B1.6 CRM principles should be integrated into relevant parts of flight crew training and operations including checklists, briefings, abnormal and emergency procedures.

B1.7 Combined CRM training for flight crew, cabin crew and technical staff

(a) Operators should provide combined training for flight crew, cabin crew and technical staff during recurrent CRM training.

(b) The combined training should address at least:

(i) Effective communication, coordination of tasks and functions of flight crew, cabin crew and technical staff; and

(ii) Mixed multinational and cross-cultural flight crew, cabin crew and technical staff, and their interaction, if applicable.

(c) The combined training should be expanded to include medical passengers, if applicable to the operation.

(d) Combined CRM training should be conducted by flight crew CRM instructor or cabin crew CRM instructor.

(e) There should be an effective liaison between flight crew, cabin crew and technical staff training departments. Provision should be made for transfer of relevant knowledge and skills between flight crew, cabin crew and technical staff CRM instructors.

B1.8 CRM training should address hazards and risks identified by the operator's safety management system.

B2 INITIAL OPERATOR'S CRM TRAINING

B2.1 The flight crew member should complete the initial operator's CRM training once. When the type of operation of a new operator is not different, the new operator should not be required to provide the initial operator's CRM training to this flight crew member a second time.

B2.2 The initial training should cover all elements specified in Table 1.

B3 OPERATOR CONVERSION COURSE - CRM TRAINING

When the flight crew member undertakes a conversion course with a change of aircraft type or change of operator, elements of CRM training should be integrated into all appropriate phases of the operator's conversion course, as specified in Table 1.

B4 ANNUAL RECURRENT CRM TRAINING

B4.1 Annual recurrent CRM training should be provided in such a way that all CRM training elements specified for the annual recurrent training in Table 1 are covered over a period not exceeding 3 years.

B4.2 Operators should update their CRM recurrent training programme over a period not exceeding 3 years. The revision of the programme should take into account information from the operator's safety management system including the results of the CRM assessment.

B5 COMMAND COURSE – CRM TRAINING

The operator should ensure that elements of CRM training are integrated into the command course, as specified in Table 1.

B6 TRAINING ELEMENTS

The CRM training elements to be covered are specified in Table 1. The operator should ensure that the following aspects are addressed:

B6.1 Automation and philosophy on the use of automation

(a) The CRM training should include training in the use and knowledge of automation, and in the recognition of systems and human limitations associated with the use of automation. The operator should, therefore, ensure that the flight crew member receives training on:

(i) The application of the operations policy concerning the use of automation as stated in the operations manual; and

(ii) System and human limitations associated with the use of automation, giving special attention to issues of mode awareness, automation surprises and over-reliance including false sense of security and complacency.

(b) The objective of this training should be to provide appropriate knowledge, skills and attitudes for managing and operating automated systems. Special attention should be given to how automation increases the need for crews to have a common understanding of the way in which the system performs, and any features of automation that make this understanding difficult.

(c) If conducted in an FSTD, the training should include automation surprises of different origin (system- and pilot-induced).

B6.2 Monitoring and intervention

Flight crew should be trained in CRM-related aspects of operation monitoring before, during and after flight, together with any associated priorities. This CRM training should include guidance to the pilot monitoring on when it would be appropriate to intervene, if felt necessary, and how this should be done in a timely manner. Reference should be made to the operator procedures for structured intervention as specified in the operations manual.

B6.3 Resilience development

CRM training should address the main aspects of resilience development. The training should cover:

(a) Mental flexibility

Flight crew should be trained to:

(i) Understand that mental flexibility is necessary to recognise critical changes;

(ii) Reflect on their judgement and adjust it to the unique situation;

(iii) Avoid fixed prejudices and over-reliance on standard solutions; and

(iv) Remain open to changing assumptions and perceptions.

(b) Performance adaptation

Flight crew should be trained to:

(i) Mitigate frozen behaviours, overreactions and inappropriate hesitation; and

(ii) Adjust actions to current conditions.

B6.4 Surprise and startle effect

CRM training should address unexpected, unusual and stressful situations. The training should cover:

(a) Surprises and startle effects; and

(b) Management of abnormal and emergency situations, including:

(i) The development and maintenance of the capacity to manage crew resources;

(ii) The acquisition and maintenance of adequate automatic behavioural responses; and

(iii) Recognising the loss and re-building situation awareness and control.

B6.5 Cultural differences

CRM training should cover cultural differences of multinational and cross-cultural crews. This includes recognising that:

(a) Approaches to the same situation or problem;

(b) Difficulties may arise when crew members with different mother tongue communicate in a common language which is not their mother tongue; and

(c) Cultural differences may lead to different methods for identifying a situation and solving a problem.

B6.6 Operator's safety culture and company culture

CRM training should cover the operator's safety culture, its company culture, the type of operations and the associated procedures of the operator. This should include areas of operations that may lead to particular difficulties or involve unusual hazards.

B6.7 Case studies

(a) CRM training should cover aircraft type-specific case studies, based on the information available within the operator's safety management system, including:

(i) Accident and serious incident reviews to analyse and identify any associated nontechnical causal and contributory factors, and instances or examples of lack of CRM; and

(ii) Analysis of occurrences that were well managed.

(b) If relevant aircraft type-specific or operator-specific case studies are not available, the operator should consider other case studies relevant to the scale and scope of its operations.

B7 CRM TRAINING SYLLABUS

Table 1 below specifies which CRM training elements should be covered in each type of training.

The levels of training in Table 1 can be described as follows:

(a) Required' means training that should be instructional or interactive in style to meet the objectives specified in the CRM training programme or to refresh and strengthen knowledge gained in a previous training.

(b) 'In-depth' means training that should be instructional or interactive in style taking full advantage of group discussions, team task analysis, team task simulation, etc., for the acquisition or consolidation of knowledge, skills and attitudes. The CRM training elements should be tailored to the specific needs of the training phase being undertaken.

Table 1: Flight Crew CRM Training

CRM Training Elements	Initial Operator's CRM Training	Operator Conversion Course When changing aircraft type	Operator Conversion Course When changing operator	Annual Recurrent Training	Command Course
General Principles					
Human factors in aviation; General instructions on CRM principles and objectives; Human performance and limitations; Threat and error management.	In-depth	Required	Required	Required	Required
Relevant to The Individual Flight Crew Member					
Personality Awareness, Human Error and Reliability, Attitudes and Behaviors, Self-Assessment and Self-Critique; Stress and Stress Management; Fatigue and Vigilance; Assertiveness, Situation Awareness, Information Acquisition and Processing.	In-depth	Not required	Not required	Required	In-depth

Relevant to The Flight Crew					
Automation and Philosophy on The Use of Automation	Required	In-depth	In-depth	In-depth	In-depth
Specific type-related differences	Required	In-depth	Not required	Required	Required
Monitoring and Intervention	Required	In-depth	In-depth	Required	Required
Relevant to The Entire Aircraft Crew					
Shared Situation Awareness, Shared Information Acquisition and Processing; Workload Management; Effective Communication and Coordination Inside and Outside the Flight Crew Compartment; Leadership, Cooperation, Synergy, Delegation, Decision-Making, Actions; Resilience Development; Surprise and Startle Effect; Cultural Differences.	In-depth	Required	Required	Required	In-depth
Relevant to the Operator and The Organisation					
Operator's Safety Culture and Company	In-depth	Required	In-depth	Required	In-depth

Culture, Standard Operating Procedures (SOPs), Organisational Factors, Factors Linked to the type of Operations; Effective Communication and Coordination with Other Operational Personnel and Ground Services.					
Case Studies	In-depth	In-depth	In-depth	In-depth	In-depth

Table 2 Flight Crew CRM Training

B8 ASSESSMENT OF CRM SKILLS

B8.1 Assessment of CRM skills is the process of observing, recording, interpreting and debriefing crews and crew member's performance using an accepted methodology in the context of the overall performance.

B8.2 The flight crew member's CRM skills should be assessed in the operational environment, but not during CRM training in the non-operational environment. Nevertheless, during training in the non-operational environment, feedback from the flight crew CRM instructor or from trainees on individual and crew performance may be given to the crew members concerned.

B8.3 The assessment of CRM skills should:

(a) Include debriefing the crew and the individual crew member;

(b) Serve to identify additional training, where needed, for the crew or the individual crew member; and

(c) Be used to improve the CRM training system by evaluating de-identified summaries of all CRM assessments.

B8.4 Prior to the introduction of CRM skills assessment, a detailed description of the CRM methodology, including the required CRM standards and the terminology used for the assessment, should be published in the operations manual.

B8.5 Methodology of CRM skills assessment

The assessment should be based on the following principles:

(a) Only observable behaviours are assessed;

(b) The assessment should positively reflect any CRM skills that result in enhanced safety; and

(c) Assessments should include behaviour that results in an unacceptable reduction in safety margin.

B8.6 Operators should establish procedures, including additional training, to be applied in the event that flight crew members do not achieve or maintain the required CRM standards.

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B9 QUALIFICATION OF FLIGHT CREW CRM INSTRUCTOR

B9.1 The provisions described herein should be fulfilled by flight crew CRM instructors responsible for classroom CRM training. However, following provisions are not applicable to:

(a) Instructors, holding a Flight Instructor Certificate, who conduct CRM training in the operational environment; and

(b) Instructors conducting training other than CRM training, but integrating CRM elements into this training.

B9.2 All personnel conducting CRM training for flight crew should be appropriately qualified to integrate elements of CRM into all appropriate training programmes. The operator shall ensure that the candidates possess the following qualifications:

(a) A training and standardisation programme for flight crew CRM instructors should be established.

(b) A flight crew CRM instructor, in order to be suitably qualified, should:

(i) Have adequate knowledge of the relevant flight operations;

(ii) Have adequate knowledge of human performance and limitations (HPL);

(iii) Have completed flight crew initial operator's CRM training;

(iv) Have adequate group facilitation skills;

(v) Have demonstrated the knowledge, skills and credibility required to train the CRM training elements in the non-operational environment, as specified in table 1.

(c) The following qualifications and experiences are also acceptable for a flight crew CRM instructor in order to be suitably qualified:

(i) A flight crew member holding a recent qualification as a flight crew CRM instructor may continue to be a flight crew CRM instructor after the cessation of active flying duties if he/she maintains adequate knowledge of the relevant flight operations.

(ii) A former flight crew member may become a flight crew CRM instructor if he/she maintains adequate knowledge of the relevant flight operations and fulfils the provisions of (b)(ii) to (b)(iv).

(iii) An experienced CRM instructor may become a flight crew CRM instructor if he/she demonstrates adequate knowledge of the relevant flight operations and fulfils the provisions of (b)(ii) to (b)(iv).

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B10 TRAINING OF FLIGHT CREW CRM INSTRUCTOR

10.1 Training of flight crew CRM instructors should be both theoretical and practical. Practical elements should include the development of specific instructor skills, particularly the integration of CRM into line operations.

10.2 The basic training of flight crew CRM instructors should include the training elements for flight crew, as specified in Table 1. In addition, the basic training should include the following:

(a) Introduction to CRM training;

(b) Operator's safety management system;

(c) Characteristics, as applicable:

(i) Of the different types of CRM trainings (initial, recurrent, etc.);

(ii) Of combined training; and

(iii) Related to the type of aircraft or operation; and

(d) Assessment.

B10.3 The refresher training of flight crew CRM instructors should include new methodologies, procedures and lessons learned.

B10.4 Instructors, holding a Flight Instructor Certificate in accordance with The Authority Requirement, who are also CRM instructors, may combine the CRM instructor refresher training with instructor refresher training.

B10.5 The training of flight crew CRM instructors should be conducted by flight crew CRM instructors with a minimum of 3 years' experience. Assistance may be provided by experts in order to address specific areas.

B11 ASSESSMENT OF FLIGHT CREW CRM INSTRUCTOR

B11.1 A flight crew CRM instructor should be assessed by the operator when conducting the first CRM training course. This first assessment should be valid for a period of 3 years.

B11.2 The operator should ensure that the process for the assessment is included in the operations manual describing methods for observing, recording, interpreting and debriefing the flight crew CRM instructor. All personnel involved in the assessment must be credible and competent in their role.

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B12 RECENCY AND RENEWAL OF QUALIFICATION AS FLIGHT CREW CRM INSTRUCTOR

B12.1 For recency of the 3-year validity period, the flight crew CRM instructor should:

(a) Conduct at least 2 CRM training events in any 12-month period;

(b) Be assessed within the last 12 months of the 3-year validity period by the operator; and

(c) Complete CRM instructor refresher training within the 3-year validity period.

B12.2 The next 3-year validity period should start at the end of the previous period.

B12.3 For renewal, i.e. when a flight crew CRM instructor does not fulfill the provisions of paragraph B12.1 of this appendix, he/she should, before resuming as flight crew CRM instructor:

(a) Comply with the qualification provisions of 9 and 11; and

(b) Complete CRM instructor refresher training.

B13 CONTRACTED CRM TRAINING

If the operator chooses not to establish its own CRM training, another operator, a third party or a training organisation may be contracted to provide the training. In case of contracted CRM training, the operator should ensure that the content of the course covers the specific culture, the type of operations and the associated procedures of the operator. When crew members from different operators attend the same course, the CRM training should be specific to the relevant flight operations and to the trainees concerned.

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APPENDIX H

QUALITY ASSURANCE CHECKS

Engineering quality assurance procedures should ensure that sample checks identified in the paragraphs below are carried out.

Note:- *This summary of quality assurance checks is not exhaustive but is intended to provide an indication of the range of checks necessary. Additional or difference checks may be needed in respect of particular support arrangements.*

1 CHECKS ON AIRCRAFT WHILST UNDERGOING SCHEDULED MAINTENANCE

(a) Compliance with maintenance schedule requirements and ensuring that only worksheets and cards reflecting the latest amendment standard are used;

(b) Completion of worksheets, including the transfer of defects to additional worksheets; their control, and final assembly. Action taken in respect of items carried forward, not completed during the particular inspection or maintenance task;

(c) Compliance with manufacturer's and company standard specifications;

(d) Standards of inspection and workmanship;

(e) Conservation of aircraft corrosion prevention techniques and other protective processes;

(f) Procedures adopted during shift-changeover to ensure continuity of inspection and responses; and

(g) Precautions taken to ensure that all aircraft are checked, on completion of any work or maintenance, for loose tools and miscellaneous small items such as split pins, wire, rivets, nuts, bolts and other debris, general cleanliness and housekeeping.

2 CHECKS ON AIRCRAFT IN SERVICE

(a) Compliance with company approved practices for cargo restraint, load distribution and spreading such that the approved modifications for cargo configurations are observed;

(b) Procedures to ensure that the aps weight data in use reflects the aircraft configuration and weight and balance schedule;

(c) Satisfactory condition of cargo/ baggage compartments and their linings, cargo handling and restraint equipment and special provisions for the carriage of livestock and attendants; and

(d) Continuing compliance with the authority airworthiness requirements in respect of cabin and other safety provisions.

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3 CHECKS ON TECHNICAL LOGS

(a) Correct completion of sector record pages and their transmission to technical records;

(b) Satisfactory rectification of defects for their deferral in accordance with the MEL and Company procedures. The recording of component details and stores control numbers, cross-referencing to deferred defect records and additional worksheets where appropriate and the inclusion of rectification details in the sector record page;

(c) Compliance with required reporting procedures in the event of flights taking place after rectification of defects without issue of a certificate of release to service;

(d) Certification of modifications including the installation of role equipment such as stretchers and conversion of the aircraft from passenger to cargo roles, and return to passenger;

(e) Correct use of maintenance and inspection control systems included in the technical log for the completion of scheduled and pre-planned tasks between scheduled maintenance inspections; and

(f) Operation of systems for recording external damage to the aircraft which has been inspected and is considered safe for further operation.

4 CHECKS ON TECHNICAL SERVICE INFORMATION

(a) Adequacy of aircraft manuals and other technical information appropriate to each aircraft type, including engines, propellers and other equipment, and the continuing receipt of revisions and amendments;

(b) Assessment of manufacturers service information, determining its application to the operator's aircraft and the recording of compliance or embodiment in each aircraft;

(c) Maintaining a register of manuals and technical literature held within the company, their locations and current amendment states; and

(d) Ensuring that all company manuals and documents, both technical and procedural, are kept up to date.

5 CHECKS ON THE OPERATOR'S GENERAL AIRWORTHINESS CONTROL PROCEDURES

(a) Responding to the requirements of Airworthiness Directives, mandatory modifications and inspections, the Authority Airworthiness Requirements and special fleet checks instituted in response to occurrences etc;

(b) Monitoring company practices in respect of scheduling or pre-planning maintenance tasks to be carried out in the open, and adequacy of the facilities provided;

(c) Effective completion of maintenance reviews at intervals required by the approved maintenance schedule and the availability of information to the certificate signatory;

(d) Operation of the defects analysis system for the operator's airframes, engines and systems and its integration with the system for mandatory occurrence reporting; the highlighting of repetitive defects and the control of deferred defects;

(e) Approval of personnel to perform inspections and maintenance tasks on the Operator's aircraft and for the issue of CMR and CRS; the effectiveness and adequacy of training and the recording of personnel experience, training and qualifications for grant of authorisation;

(f) The effectiveness of technical instructions issued to maintenance staff;

(g) The adequacy of staff in terms of qualifications, numbers and ability in all areas of support for the operator which affect airworthiness;

(h) The completeness of the quality audit programme;

(i) Compliance with the requirements of the approved Maintenance Schedule, including maintenance/inspection periods, component overhaul/test/calibration control, records of cycles/landings etc and for granting variations at the request of the operator;

(j) Maintaining logbooks and other required records on behalf of the operator; and

(k) Ensuring that major and minor repairs are only carried out in accordance with approved repair schemes and practices.

6 CHECKS ON STORES AND STORAGE PROCEDURES

(a) The adequacy of stores and storage conditions for rotatable components, small parts, perishable items, flammable fluids, engines and bulky assemblies;

(b) The procedure for examining incoming components, materials and items for conformity with order, release documentation and approved source;

(c) The 'batching' of goods and identification of raw materials, the acceptance of part life items into stores, requisition procedures;

(d) Labelling procedures, including the use of serviceable/ unserviceable/ repairable labels, and their certification and final disposal after installation. Also labelling procedures for components which are serviceable but 'part life' only;

(e) The internal release procedure to be used when components are to be forwarded to other locations within the organisation;

(f) The procedure to be adopted for the release of goods or overhauled items to other organisations. (this procedure should also cover items being sent away for rectification or calibration);

(g) The procedure for the requisitioning of tools together with the system for ensuring that the location of tools is known at all times; and

(h) Control of shelf life and storage conditions in the stores. Control of the free- issue dispensing of standard parts, identification and segregation.

7 CHECKS ON MAINTENANCE FACILITIES

(a) Cleanliness, state of repair and correct functioning of hangars, hangar facilities and special equipment, and the maintenance of mobile equipment;

(b) Adequacy and functioning of special services and techniques including welding, NDT, weighing, painting;

(c) Viewer/printer equipment provided for use with micro-fiche, micro-film and compact disk ensuring regular maintenance takes place and an acceptable standard of screen reproduction and printed copy are achieved; and

(d) The adequacy of special tools and equipment appropriate to each type of aircraft, including engines, propellers and other equipment.

8 CHECKS ON LINE STATIONS, IN ADDITION TO THE FOREGOING AS APPLICABLE

(a) The adequacy of facilities and staff;

(b) The provision of covered accommodation for aircraft when maintenance is undertaken which requires a controlled environment, and for the accomplishment of work in the open where this is unavailable;

(c) The cleanliness, state of repair, correct functioning and maintenance of ground support equipment including ground de-icing/anti-icing equipment;

(d) The effectiveness of any sub-contracted arrangements for ground handling, servicing and maintenance support and compliance with the operator's contracted arrangements;

(e) Quality monitoring of fuel supplies including supplier checks and uplift contamination checks; the effectiveness and completion of fuel tank water drain checks;

(f) The care and maintenance of cargo containers, freight nets, pallets and other cargo equipment;

(g) The currency, scope and effectiveness of locally raised technical instructions and the procedure for bringing them to the notice of maintenance personnel;

(h) Adequacy of the technical publications held at the station for the operator's aircraft, their currency and procedures for amendment; and

(i) The accuracy and control of worksheets or cards, to ensure that only up-to-date issues are used.

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APPENDIX I

CERTIFICATE OF MAINTENANCE REVIEW

1 CERTIFICATE OF MAINTENANCE REVIEW (CMR)

(a) To satisfy the requirement for the CMR of an aircraft, referred to Chapter 9, paragraph 9, a full documented review of the aircraft records shall be carried out by the air operator in order to be satisfied that:

(i) Airframe, engine and propeller flying hours and associated flight cycles have been properly recorded, and;

(ii) The flight manual is applicable to the aircraft configuration and reflects the latest revision status, and;

(iii) All the maintenance due on the aircraft according to the approved maintenance programme has been carried out, and;

(iv) All known defects have been corrected or, when applicable, carried forward in a controlled manner, and;

(v) All applicable airworthiness directives have been applied and properly registered, and;

(vi) All modifications and repairs applied to the aircraft have been registered and are approved or accepted by authority, and;

(vii) All service life limited components installed on the aircraft are properly identified, registered and have not exceeded their approved service life limit, and;

(viii) All maintenance has been released in accordance with authority requirements, and;

(ix) The current mass and balance statement reflect the configuration of the aircraft and is valid, and;

(x) The aircraft complies with the latest revision of its type design approved/ accepted by Authority, and

(xi) If required, the aircraft holds a noise certificate corresponding to the current configuration of the aircraft.

(b) The CMR staff of the air operator shall carry out a physical survey of the aircraft. For this survey, CMR staff not appropriately qualified to type-rated Licensed Aircraft Engineer (LAE) shall be assisted by such qualified LAE.

(c) Through the physical inspection of the aircraft, the CMR staff shall ensure that:

(i) all required markings and placards are properly installed;

(ii) the aircraft complies with its approved flight manual;

(iii) the aircraft configuration complies with the approved documentation;

(iv) no evident defect can be found that has not been addressed; and

(v) no inconsistencies can be found between the aircraft and documented review of records performed in accordance with paragraph 1(a) of this Appendix.

(d) The maintenance review can only be issued:

(i) by CMR staff appropriately authorized by the air operator and accepted by authority, and;

(ii) when satisfied that the maintenance review has been completely carried out and that there is no non-compliance which is known to endanger flight safety.

(e) A copy of the maintenance review issued for an aircraft shall be sent to the Authority within 10 days.

(f) Maintenance review tasks shall not be contracted or sub-contracted.

(g) Should the outcome of the maintenance review be inconclusive, or should the review show discrepancies on the aircraft linked to deficiencies in the content of the maintenance programme, the Authority shall be informed by the air operator as soon as practicable but in any case, within 72 hours from the moment the air operator identifies the condition to which the review relates.

The maintenance review shall not be issued until all findings have been closed.

2 RESPONSIBILITIES OF THE CMR STAFF

(a) The CMR staff are responsible for performing both the documental and the physical survey.

(b) Procedures must be established by the air operator in order to perform the maintenance review.

(c) Procedures must make very clear that the inspections (both documental and physical) belongs to the CMR staff, who can go beyond the depth contained in the GMM if they find it necessary. At the end, it is the responsibility of the CMR staff to be satisfied that the aircraft complies with AOCR, Authority regulations and is airworthy, and the air operator must ensure that no pressure or restrictions are imposed on the CMR staff when performing their duty.

(d) A maintenance review report shall be produced by the CMR staff, detailing all items checked and the outcome of the review.

(e) The CMR staff should have a position in the organisation independent from the airworthiness management process or with overall authority on the airworthiness management process of complete aircraft.

(f) The CMR staff are responsible for the items checked during the maintenance review. If the CMR staff are not independent of the continuing airworthiness management process and were nominated on the basis of the option of having overall authority on such a process, they will be responsible for the full continuing airworthiness of such aircraft. Nevertheless, this responsibility will be a consequence of their position in the organisation and not of their function as the CMR staff.

(g) The issuance of the maintenance review by the CMR staff only certifies that the aircraft is considered airworthy in relation to the scope of the maintenance review performed. It only certifies that the aircraft is considered airworthy at the time of the review. It is the responsibility of the air operator to ensure that the aircraft is fully airworthy at any time.

3 MAINTENANCE REVIEW PROCESS

(a) A full documented review is a check of at least the following categories of documents:

(i) Aircraft continuing airworthiness record system;

(ii) Aircraft technical log system;

(iii) List of deferred defects, Minimum Equipment List and Configuration Deviation List if applicable;

(iv) Aircraft flight manual including aircraft configuration;

(v) Aircraft maintenance programme;

(vi) Maintenance data;

(vii) Relevant work packages;

(viii) AD status;

(ix) Modification and SB status;

(x) Modification and repair approval sheets;

(xi) List of service life limited component;

(xii) Relevant CAAT form 1 or equivalent as specified in the Repair Station Certification Requirements;

(xiii) Mass and balance report and equipment list; and

(xiv) Aircraft, engine and propeller TC data sheets.

(xv) As a minimum, sample checks within each document category should be carried out.

(xvi) The air operator should develop procedures for the CMR staff to produce the maintenance review report that confirms the above have been reviewed and found in compliance with AOCR and CAAT airworthiness regulations.

4 CMR STAFF (PHYSICAL INSPECTION)

(a) The physical inspection could require actions categorized as maintenance (e.g. operational tests, tests of emergency equipment, visual inspections requiring panel opening etc.). In this case, after the maintenance review, a release to service shall be issued.

(b) When the CMR staff are not appropriately qualified to type-rated LAE in order to release such maintenance, they are required to be assisted by such qualified LAE. However, the function of such LAE personnel is limited to perform and release the maintenance actions requested by the CMR staff, it not being their function to perform the physical inspection of the aircraft. The CMR staff shall carry out the physical survey of the aircraft, and this survey includes the verification that no inconsistencies can be found between the aircraft and the documented review of records.

(c) This means that the CMR staff should be the one performing both the documented review and the physical inspection of the aircraft, it not being the intent of the rule to delegate the inspection to LAE who are not the CMR staff.

(d) The physical inspection may include verifications to be carried out during flight.

(e) The air operator should develop procedures for the CMR staff to produce a compliance report that confirms the physical inspection has been carried out and found satisfactory.

(f) To ensure compliance the physical inspection may include relevant sample checks of items.

(g) New aircraft defects identified during the review must also be recorded in the technical log by appropriate type-rated LAE. All aircraft defects require a clearing maintenance action (rectification or appropriate deferral) prior to further flight.

5 MAINTENANCE REVIEW (MAINTENANCE REVIEW REPORT)

The Maintenance Review Report shall be in English and contain at least information in accordance with Attachment 1 of this Appendix (The explanatory note can be removed when keeping the completed report).

If the result of the full maintenance review is unsatisfactory or inconclusive, then this report, along with all necessary supporting information must be sent to the CAAT within the required timeframe from the moment the reason for which the review is inconclusive is found in order to satisfy the requirements of the review.

Once all findings have been corrected and satisfactory, the report can be issued with certification statement and resubmitted to CAAT.

A copy of both physical inspection and document review compliance reports stated above shall be sent to the Authority together with all required supporting documents.

ATTACHMENT 1: MAINTENANCE REVIEW REPORT

Air Operator Name			
AOC No.		**AOC Valid Until**	
Aircraft Owner Name			
CMR Staff Name			
CMR Authorized No.			

Notes for use: also refer to the Explanatory Notes on the last page of this report

- Where an item is satisfactory, indicate '**Y**' into the appropriate column. If not applicable, indicate '**N/A**'
- All aircraft defects will require maintenance action prior to further flight
- Section 5 cannot be certified if there is evidence or indications that the aircraft is not airworthy
- Send the report form to **airworthiness@caat.or.th**

Date next review due	

Complete sign off on Section 5

1. AIRCRAFT DETAILS

Registration Mark								
Classification	☐ Aeroplane		☐ Helicopter		☐ Other : _____			
Category	☐ Passenger		☐ Cargo		☐ Other : _____			
	Airframe		**Engine(s)**			**Propeller(s)**		
State of Design								
TCDS No.		**Rev.**		**Rev.**			**Rev.**	
Manufacturer								
Type / Model								
Serial No.								
Date of Manufacture								
Hours since new								
Cycles sine new								
Date of Overhaul								
Hours since overhaul								
Cycles since overhaul								
TCDS No. for Noise and Emissions							**Rev.**	
Maximum Take-Off Weight							**kg.**	

2. DOCUMENT REVIEW

Date of Document Review				
Place of Document Review				
C of R Reference		**C of R Issue Date**		
C of A Reference		**C of A Expiry Date**		
The aircraft has been issued with a CAAT Type Acceptance Certificate?				
The aircraft conforms to the latest revision of its TCDS and acceptable design changes?				
The aircraft holds a noise certificate corresponding to the current aircraft configuration?				
Approved Flight Manual Reference		**Issue / Rev.**		
Manufacturer Flight Manual Reference		**Issue / Rev.**		
The approved flight manual is applicable to the aircraft configuration and reflects the latest revision status?				
Approved Maintenance Program Reference		**Issue / Rev.**		
Manufacturer Maintenance Program Reference		**Issue / Rev.**		
All maintenance due according to the approved maintenance program has been carried out?				
The aircraft has been maintained for the previous 12 months by CAAT approved maintenance organizations and/or organization with maintenance under AOC privilege?				
Weight and Balance Manual Reference		**Issue / Rev.**		
Date of Last Weighed				
Center of Gravity Data		**% MAC or Other: _____**		
Within limits and accurate?				
The current mass and balance statement reflect the current aircraft configuration and is valid?				
Approved Minimum Equipment List Reference		**Issue / Rev.**		
Master Minimum Equipment List Reference		**Issue / Rev.**		
Aircraft Technical Log Issue / Rev.				
The current Aircraft Technical Log used conforms to the approved format in GMM?				
Aircraft Technical Log (see Note 1) contains all required current information?				
Airframe, engine and propeller flying hours and cycles have been properly recorded?				
All known defects and inoperative equipment / MEL items, CDL items, have been properly rectified or deferred/carried forward in a controlled manner?				

All maintenance and relevant work packages have been carried out and properly released in accordance with approved procedure and maintenance data?	
All components installed onto the aircraft are in a satisfactory condition, released on an acceptable airworthiness approval tag?	
All applicable Airworthiness Directives (AD) have been assessed, incorporated, and recorded?	
All STCs, modifications, and repairs installed onto the aircraft and its components have been correctly approved or accepted by CAAT and appropriately recorded?	
All applicable Instruction for Continued Airworthiness (ICA) for all installed STCs has been incorporated into the approved maintenance program and properly complied?	
All time controlled and life limited components installed on the aircraft are properly identified, registered, and controlled in accordance with approved maintenance program, and have not exceeded their mandatory limit?	
List of persons or organizations having carried out continuing airworthiness activities since the last review:	
List of persons or organizations having carried out maintenance tasks on the aircraft and its components since the last review:	

The following documents are required to be submitted with this report:	**Status Date**
(a) Copy of C of R, C of A, and Noise Certificate	
(b) The latest TCDS of aircraft, engine, and propeller	
(c) Airworthiness Directives status list (Aircraft, Engine, Propeller, Appliances)	
(d) All incorporated modifications (STC, incorporated SB, other approved documents) status list	
(e) All incorporated repairs status list including aircraft external damage marking	
(f) All installed time controlled and life limited components status list	
(g) The latest weight and balance report and equipment list	
(h) Current Certificate of Release to Service	
(i) Aircraft technical logbook with the latest maintenance release	
(j) Deferred / Carried forward defects, MEL, CDL items status list	
(k) Authorized Release Certificate or equivalent of the following applicable components: a. Whole aircraft b. Engine c. Propeller d. APU	

3. AIRCRAFT PHYSICAL SURVEY (see Note 2)

Date of Aircraft Physical Survey							
Place of Aircraft Physical Survey							
Name of Assisting Licensed Aircraft Engineer (see Note 3)							
Assisting LAE Signature							
LAE License No.				**License Valid Until**			
Area	**Satisfied?**	**Area**	**Satisfied?**	**Area**	**Satisfied?**	**Area**	**Satisfied?**
Fuselage		Control Surfaces		Instrument Panel		Power Plant	
Registration Marks		Static Wicks		Avionics		Propellers / Rotors	
Wings		Doors / Panels		Electrics			
Empennage		Cargo		Safety Equipment		Flight Recorders	
Landing Gears		Cockpit / Cabin		Systems			
Aircraft Identification and Placards			Type Certification identification plate fitted?				
			Aircraft registration markings and fireproof plate correct?				
Documents on Board			The required documents are on board (see Note 4)?				
			The weight and balance records are updated?				
			The external damage marking records are updated?				
			The third-party liability insurance certificate is valid?				
			All onboard documentation is valid and correct?				
Inoperative Equipment			Physical check that placarding is correct?				
Components			Overhaul and limited life components verification, where practicable, of serial number's correct?				
			Major components serial numbers are correct?				
Modifications and Repairs			Recorded and accomplished as per requirements?				
General Condition Inspection			Aircraft is in satisfactory condition?				
All required markings and placards (see Note 5) are properly installed and legible?							
The aircraft complies with its approved flight manual?							
The aircraft configuration complies with the approved documentation (TCDS, STC, etc.)?							
All defects have been correctly rectified or deferred/carried forward in a controlled manner (No evidence defect that has not been addressed is found)?							
All existing defects that affect or may affect the airworthiness and safe operation of the aircraft have been made known to the aircraft commander?							
The aircraft condition is consistent with the documented review of records in **Section 2** of this report?							

4. DEFECTS / FINDINGS OBSERVED (see Note 6)

(All defects / findings must be cleared before certifying the review)

Reference	Defects / Findings Description	Rectification / Actions

Extra page(s) attached ? _____

5. CERTIFICATION (see Note 7)

(The review cannot be certified with open defects / findings)

Statement
I certify that all of the above records have been reviewed for the period plus a physical survey of the aircraft undertaken and the aircraft [HS -] is found to be fully in compliance with all of the applicable requirements. **The aircraft in its current configuration complies with the following:** - **Airworthiness directives up to the latest published issue** - **Type certificate datasheet** - **Maintenance programme** - **Limitation for life-limited parts and time-controlled components** - **The valid weight and center of gravity schedule reflecting the current configuration of the aircraft** - **All modifications and repairs requirements** - **The current flight manual including supplements** - **Operational requirements** **In addition, all of the above items are properly entered and certified in the aircraft continuing airworthiness record system and/or in the its technical log.** **At the time of the review, the aircraft is considered airworthy.**

CMR Staff Signature	**I confirm that information in this report is true and accurate** **Report completed date: / /**

Explanatory notes for completing the Maintenance Review Report

General, for all sections

- Enter a '**Y**' in the appropriate column to indicate that the aircraft meets the applicable requirements
- Enter '**N/A**' if the requirement is not applicable to the aircraft or operation

Note 1

Aircraft Technical Log information must contain:

- Details of the registered name and address of the operator
- Aircraft type
- Aircraft national and registration marks
- Details of when the next scheduled maintenance is due
- The current certificate of release to service (CRS)
- Details of all information considered necessary to ensure continued flight safety:
  - The date and place of take-off and landing
  - The times at which the aircraft took off and landed
  - The running total of flying hours/cycles/landings, such that the hours/cycles/landings to the next schedule maintenance or life of an aircraft or component can be determined
  - Details of any failure, defect or malfunction to the aircraft affecting airworthiness or safe operation of the aircraft including emergency systems, and any failure, defect or malfunctions in the cabin or galleys that affect the safe operation of the aircraft or the safety of its occupants that are known to the commander. Date and sign of such entries included
  - The quantity of fuel and oil uplifted and the quantity of fuel available in each tank, or combination of tanks, at the beginning and end of each flight
  - The pre-flight inspection signature
- Details of all deferred or existing defects that affect or may affect the safe operation of the aircraft and must therefore be known to the aircraft commander:
  - A cross reference for each deferred defect such that the original defect can be identified
  - The original date of occurrence of the defect deferred
  - Brief details of the defect
  - Details of the eventual rectification carried out and its CRS or a clear cross-reference back to the document that contains details of the eventual rectification or deferral
- Any necessary maintenance support information that the aircraft commander needs to know.

Note 2

The physical survey could require actions categorised as maintenance (e.g. operational tests, tests of emergency equipment, visual inspections requiring panel opening, etc.). In this case, after the maintenance review, a release to service must be issued. The physical survey may include verifications to be carried out during flight. To ensure compliance, the physical survey may include relevant sample checks of items.

Note 3

If the CMR staff are qualified as type-rated Licensed Aircraft Engineer (LAE), fill in the license number and validity.

When the CMR staff are not appropriately qualified as type-rated LAE in order to release any maintenance as described in Note 2, it is required them to be assisted by such qualified personnel. However, the function of such LAE personnel is limited to performing and releasing the maintenance actions requested by the CMR staff, it not being their function to perform the physical survey of the aircraft. This means that the

CMR staff who is going to sign the maintenance review report should be the one performing both the documented review and the physical survey of the aircraft. It is not the intent of the rule to delegate the survey to LAE personnel who are not CMR staff.

Note 4

Aircraft shall carry the following documents on board:

- Certificate of Registration (C of R)
- Certificate of Airworthiness (C of A)
- Radio License
- Noise Certificate
- Third-Party Liability Insurance Certificate(s)
- Certified True Copy Air Operator Certificate and Copy of Operations Specifications relevant to the aircraft
- Journey logbook or equivalent approved document
- Technical logbook or equivalent approved document
- List of emergency equipment carried on board
- Aircraft Flight Manual (AFM)
- Approved Minimum Equipment List (MEL) / Configuration Deviation List (CDL)
- Electronic Flight Bags – if included in approved Operations Specifications
- Load Sheet or Weight and Balance Report
- Records of aircraft external damage markings
- Any other information necessary for the operation of the aircraft

Note 5

The markings and placards can be required by certification information in TCDS, AFM, manufacturer instructions (ATA Chapter 11), STCs' ICA, Ads, or supplemental information from approved drawing.

Note 6

New aircraft defects identified during the review must also be recorded in the technical log by appropriate type-rated LAE. All aircraft defects require a clearing maintenance action (rectification or appropriate deferral) prior to further flight.

If the result of the full maintenance review is unsatisfactory or inconclusive, then this report, along with all necessary supporting information must be sent to Airworthiness and Aircraft Engineering Department (AIR), CAAT, within 72 hours from the moment the reason for which the review is inconclusive is found in order to satisfy the requirements of the review. Once all findings have been corrected and satisfactory, the report can be issued with certification statement in Section 5 of this report and resubmitted to CAAT.

Note 7

Once the report is completed and certified, it must be submitted along with the documents listed at the end of Section 2 of this report to **airworthiness@caat.or.th** within 10 days.

The next review due date shall be calculated from the certification date in Section 5 of this report.

APPENDIX J

MINIMUM EQUIPMENT LIST (MEL)

1 If deviations from the requirements in the certification of aircraft were not permitted an aircraft could not be flown unless all systems and equipment were operable. Evidences will be provided by the operator to prove that some unserviceability can be accepted in the short term when the remaining operative systems and equipment provide for continued safe operations.

2 A minimum equipment list, approved by the Authority, shall be established based on the master minimum equipment list for the aircraft type by the organization responsible for the type design in conjunction with the State of Design.

3 The operator is required to prepare a minimum equipment list designed to allow the operation of an aircraft with certain systems or equipment inoperative provided an acceptable level of safety is maintained.

4 The minimum equipment list is not intended to provide for operation of the aircraft for an indefinite period with inoperative systems or equipment. The basic purpose of the minimum equipment list is to permit the safe operation of an aircraft with inoperative systems or equipment within the framework of a controlled and sound programme of repairs and parts replacement.

5 Operators are to ensure that no flight is commenced with multiple minimum equipment list items inoperative without determining that any interrelationship between inoperative systems or components will not result in an unacceptable degradation in the level of safety and/or undue increase in the flight crew workload.

6 The exposure to additional failures during continued operation with inoperative systems or equipment must also be considered in determining that an acceptable level of safety is being maintained. The minimum equipment list may not deviate from requirements of the flight manual limitations section, emergency procedures or other airworthiness requirements of the Authority unless the appropriate airworthiness authority or the flight manual provides otherwise.

7 Systems or equipment accepted as inoperative for a flight shall be placarded where appropriate, and all such items should be noted in the aircraft technical log to inform the flight crew and maintenance personnel of the inoperative system or equipment.

8 For a particular system or item of equipment to be accepted as inoperative, it may be necessary to establish a maintenance procedure, for completion prior to flight, to de-activate or isolate the system or equipment. It may similarly be necessary to prepare an appropriate flight crew operating procedure.

9 The responsibilities of the pilot-in-command in accepting an aeroplane for operation with deficiencies in accordance with a minimum equipment list are specified in 11.1.1 of Chapter 5

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APPENDIX K

FLIGHT SAFETY DOCUMENTS SYSTEM

1 ORGANISATION

1.1 A flight safety documents system should be organised according to criteria which are essential to provide easy access to information required for flight and ground operations contained in the various operational documents comprising the system, as well as to manage the distribution and revision of operational documents.

1.2 Information contained in a flight safety documents system should be grouped according to the importance and use of the information, as follows:

(a) Time critical information e.g. Information that can jeopardise the safety of the operation if not immediately available e.g. Flight staff instructions, Internal Notice to Airman (INTAM), changes to flight manual that are made mandatory or approved by the authority.

(b) Time sensitive information e.g. Information that can affect the level of safety or delay the operation if not available in a short time period.

(c) Frequently used information e.g. Operations manual, operator's policies, QRH etc.

(d) Reference information, e.g. Information that is required for the operation but does not fall under (b) or (c) above; and

(e) Information that can be grouped based on the phase of operation in which it is used.

1.3 Time critical information should be placed early and prominently in the flight safety documents system.

1.4 Time critical information, time sensitive information, and frequently used information should be placed in cards and quick-reference guides.

2 VALIDATION

2.1 The flight safety documents system should be validated before deployment, under realistic conditions. Validation should involve the critical aspects of the information use, in order to verify its effectiveness. Interaction among all groups that can occur during operations should be also be included in the validation process.

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3 DESIGN

3.1 A flight safety documents system should maintain consistency in terminology, and in the use of standard terms for common items and actions.

3.2 Operational documents should include a glossary of terms, acronyms and their standard definition updated on a regular basis to ensure access to the most recent terminology. All significant terms, acronyms and abbreviation included in the flight documents system should be defined.

3.3 A flight safety documents system should ensure standardisation across documents types, including writing style, terminology use of graphics and symbols, and formatting across documents. This includes a consistent location specific types of information, consistent use of units of measurement and consistent use of codes.

3.4 A flight safety documents system should include a master index to locate, in a timely manner, information included in more than one operational document.

Note:- *The master index must be placed in the front of each document and consist of no more than three levels of indexing. Pages containing abnormal and emergency information must be tabbed for direct access.*

3.5 A flight safety documents system should comply with the requirements of the operator's quality system, where applicable.

4 DEPLOYMENT

4.1 Operators shall monitor deployment of the flight safety documents system, to ensure appropriate and realistic use of the documents, based on the characteristics of the operational environment and in a way which is both operationally relevant and beneficial to operational personnel. This monitoring shall include a formal feedback system for obtaining input from operational personnel.

5 AMENDMENT

5.1 Operators shall develop an information gathering, review, distribution and revision control system to process information and data obtained from all sources relevant to the type of operation conducted.

Note:- *Aircraft manufacturers provide information for the operation of specific aircraft that emphasises the aircraft systems and procedures under conditions that may not fully match the requirements of operators. Operators shall ensure that such information meets their specific needs.*

5.2 Operators shall develop an information gathering, review and distribution system to process information resulting from changes that originates within the operator, including:

(a) Changes resulting from the installation of new equipment;

(b) Changes in response to operating experience;

(c) Changes in an operator's policies and procedures;

(d) Changes in an operator certificate; and

(e) Changes for purposes of maintaining cross fleet standardisation.

Note:- *Operators shall ensure that crew coordination philosophy, policies and procedures are specific to their operation.*

5.3 A flight safety documents system shall be reviewed:

(a) At least once a year;

(b) After major events (mergers, acquisitions, rapid growth, downsizing, etc.);

(c) After technology changes (introduction of new equipment); and

(d) After changes in safety regulations.

5.4 Operators shall develop methods of communicating new information. The specific methods should be responsive to the degree of communication urgency.

Note:- *As frequent changes diminish the importance of new or modified procedures, it is desirable to minimise changes to the flight safety documents system.*

5.5 New information shall be reviewed and validated considering its effects on the entire flight safety documents system.

5.6 The method of communicating new information shall be complemented by a tracking system to ensure currency by operational personnel. The tracking system should include a procedure to verify that operational personnel have the most recent updates.

APPENDIX L

LOW VISIBILITY OPERATIONS - TRAINING AND QUALIFICATIONS

1 GENERAL

1.1 The content in this Appendix is applicable to both aeroplanes and helicopters in general. In the case when it is applicable only to helicopters, it would be specified separately. Detailed information on Aeroplane operations can also be found in GM for All Weather Operations. An operator shall develop flight crew member training programmes and ensure that the programmes for low visibility operations include structured courses of ground, flight simulator and/or flight training.

1.2 Flight crew members with no experience in Category II or III operations must satisfy the training requirements contain in this Appendix.

1.3 The operator may abbreviate the course content for pilots with Category II and III experience, provided the content of the abbreviated course is acceptable to the Authority.

(a) Flight crew members with Category II and III experience may undertake an abbreviated ground training course.

(b) Flight crew members with Category II or III experience with the operator may undertake an abbreviated ground, flight simulator and/or flight training course. The abbreviated course must include at least the requirements in Paragraph 4.

2 GROUND TRAINING

2.1 An operator must ensure that the initial ground training course for low visibility operations covers at least:

(a) The characteristics and limitations of the ILS and/or MLS;

(b) The characteristics of the visual aids;

(c) The characteristics of fog;

(d) The operational capabilities and limitations of the particular airborne system;

(e) The effects of precipitation, ice accretion, low level wind shear and turbulence;

(f) The effects of specific helicopter malfunctions;

(g) The use and limitations of RVR assessment systems;

(h) The principles of obstacle clearance requirements;

(i) Recognition and action to be taken in the event of failure of ground equipment;

(j) The procedures and precautions to be followed with regard to surface movement during operations when the RVR is 400 m or less and any additional procedures required for take-off in condition below 150 m;

(k) The significance of Decision Heights based upon radio altimeters and the effect of terrain profile in the approach area on radio altimeter readings and on the automatic approach/landing systems;

(l) The importance and significance of Alert Height if applicable and the action in the event of any failure above and below the alert height;

(m) The qualification requirements for pilots to obtain and retain approval to conduct Low Visibility Take-offs and Category II and III operations; and

(n) The importance of correct seating and eye position.

3 FLIGHT SIMULATOR TRAINING AND/OR FLIGHT TRAINING

3.1 An operator shall ensure that flight simulator and/ or flight training for low visibility operations includes:

(a) Checks of satisfactory functioning of equipment, both on the ground and in flight;

(b) Effect of minima caused by changes in the status of ground installations;

(c) Monitoring of automatic flight control systems and auto-land status annunciators with emphasis on the action to be taken in the event of failures of such systems;

(d) Action to be taken in the event of failures such as engines, electrical systems, hydraulics or flight control system;

(e) The effect of known unserviceability and use of minimum equipment lists;

(f) Operating limitations resulting from airworthiness certification;

(g) Guidance on the visual cues required at decision height together with information on maximum deviation allowed from glide path or localiser; and

(h) The importance and significance of Alert Height if applicable and the action in the event of any failure above and below the Alert Height.

3.2 Each flight crew member shall be trained to carry out his duties and instructed on the coordination required with other crew members. Maximum use should be made of suitably equipped flight simulators for this purpose.

3.3 Training shall be divided into phases covering normal operations with no helicopter or equipment failures but including all weather conditions which may be encountered and detailed scenarios of helicopter and equipment failure which could affect Category II or III operations. If the helicopter system involves the use of hybrid or other special systems (such as head up displays or enhanced vision equipment), flight crew members must practice the use of these systems during the flight simulator phase of training.

3.4 The operator shall include training on incapacitation procedures appropriate to low visibility take-offs and Category II or III operations.

3.5 For helicopters with no type specific flight simulator, operators must ensure that the flight training phase specific to the visual scenarios of Category II operations is conducted in a

flight simulator approved for the purpose by the Authority. Such training must include a minimum of 4 approaches. Training that is type specific shall be practiced in the helicopter.

3.6 Category II and III training shall include at least the following exercise:

(a) Approach using the appropriate flight guidance, autopilots and control systems installed in the helicopter, to the appropriate decision height and to include transition to visual flight and landing;

(b) Approach with all engines operating using the appropriate flight guidance systems, autopilots and control systems installed in the helicopter down to the appropriate decision height followed by missed approach, all without external visual reference;

(c) Where appropriate, approaches using automatic flight systems to provide automatic flare, hover, landing and roll-out; and

(d) Normal operations of the applicable system both with and without acquisition of visual cues at decision height.

3.7 Subsequent phases of training shall include at least:

(a) Approaches with engine failure at various stages of the approach

(b) Approaches with critical equipment failure (e.g. electrical systems, auto flight systems, ground and /or airborne ILS/MLS systems and status monitor).

(c) Approaches where failure of auto flight equipment at low level require either:

(i) Reversion to manual flight to control flare, hover, landing and roll out or missed approach; or

(ii) Reversion to manual flight on a degraded automatic mode to control missed approaches from, at or below decision height including those which may result in a touchdown on the runway.

(d) Failure of the systems which will result in excessive localiser and/or glideslope deviation, both above and below decision height, in the minimum visual conditions authorised for the operation. In addition, a continuation to a manual landing must be practiced if a head-up display forms the only flare mode; and

(e) Failures and procedures specific to helicopter type or variant.

3.8 The training programme must provide practice in handling faults which require a reversion to higher minima.

3.9 The training programme must include, the handling of the helicopter when, during a fail passive Category III approach, the fault causes the autopilot to disconnect at or below decision height when the last reported RVR is 300 m or less.

3.10 When take-offs are conducted in RVRs of 400 m or below, training shall be established to cover systems failure and engine failures resulting in continued as well as rejected take-offs.

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4 CONVERSION TRAINING REQUIREMENTS TO CONDUCT LOW VISIBILITY TAKE-OFF AND CATEGORY II AND III OPERATIONS.

4.1 Each flight crew member shall successfully complete low visibility procedure training to qualify for conversion to a new type or variant of helicopter in which the low visibility take-off and Category II and III Operations will be conducted. A flight crew member may undertake an abbreviated training programme in accordance with Paragraph 1.3 provided he has the necessary training and experience.

4.2 Ground training shall follow the requirements contained in Paragraph 2. 1, taking into account the flight crew member's training and experience in Category II and III operations.

4.3 Notwithstanding Paragraph 1. 3, a flight crew member undergoing simulator training and/ or flight training shall meet the following requirements:

(a) A minimum of 8 approaches and/or landings in a flight simulator approved for the purpose;

(b) When no type specific flight simulator is available, a minimum of 3 approaches including at least one go-around is required on the helicopter; and

(c) Appropriate additional training if any special equipment is required such as head-up displays or enhanced vision equipment.

4.4 Flight Crew Qualification

4.4.1 The operator shall ensure that each flight crew member completes a check specific to the operator and the type of helicopter operated before conducting Category II or III operations. The check may be replaced by the successful completion of the flight simulator and/ or flight training prescribed in Paragraph 4.3 above.

4.5 Line Flying under Supervision.

4.5.1 An operator shall ensure that each flight crew member shall have undergone supervision before performing the following operations:

(a) For Category II when a manual landing is required, a minimum of 3 landings from autopilot disconnect.

(b) For Category III, a minimum of 3 Autolands except that only 1 Autoland is required when the training required in sub-paragraph 4.3 above has been carried out in a full flight simulator.

4.6 Addition Experience Requirements for Pilot-in-command

4.6.1 The operator shall not designate a flight crew member as pilot-in-command for low visibility take-off, and Category II and III operations unless the flight crew member has achieved:

(a) 50 hours or 20 sectors as pilot-in-command on the type before performing any Category II or III operations; and

(b) 100 hours or 40 sectors as pilot-in-command on the type. 100 m must be added to the applicable Category II or III RVR minima unless he has been previously qualified for Category II or III operations with another operator.

4.6.2 The Authority may authorise a reduction in the command experience requirement contained in Paragraph 1 for flight crew members who have Category II or III command experience.

4.7 Low visibility Take-off with RVR less than 150m

4.7.1 An operator must ensure that prior to authorisation to conduct take-offs in RVRs below 150 m the following training is carried out:

(a) Normal take-off in minimum authorised RVR conditions;

(b) Take-off in minimum authorised RVR conditions with an engine failure at or after TDP; and

(c) Take-off in minimum authorised RVR conditions with an engine failure before the TDP.

4.7.2 An operator shall ensure that the training required in sub -paragraph 4 . 7. 1 above is carried out in an approved flight simulator. This training must include the use of any special procedures and equipment. Where no approved simulator exists, the Authority may approve such training in a helicopter without the requirement for minimum RVR conditions.

4.7.3 An operator shall ensure that a flight crew member has completed a check before conducting low visibility take-offs in RVRs of less than 150 m if applicable. The check may only be replaced by successful completion of the flight simulator and/ or flight training prescribed in sub-paragraph 4. 7. 1 on initial conversion to a helicopter type.

4.8 Recurrent Training and Checking

4.8.1 An operator shall ensure that, in conjunction with the normal recurrent training and operator proficiency checks, a pilot's knowledge and ability to perform the tasks associated with the particular category of operation, including low visibility take-off for which he is authorised is checked.

4.8.2 The recurrent training shall include a minimum of two approaches, of which one must be a missed approach and at least one low visibility take-off to the lowest applicable minima. The period of validity for this check is 6 months including the remainder of the month of issue

4.8.3 Recurrent training and checking for Category III operations must be performed in a flight simulator approved by the Authority for Category III training.

4.8.4 For recurrent training and checking for Category III operations on helicopters with a fail passive flight control system, the operator shall ensure that flight crew members completes training at least once every 18 months for a missed approach as a result of an autopilot failure at or below decision height when the last reported RVR is 300 m or less.

4.8.5 The Authority may authorise recurrent training for Category II operations in a helicopter type where no approved flight simulator is available.

4.9 Recency Requirements

4.9.1 The operator shall not assign a flight crew member to function as a pilot-in command or a co-pilot for low visibility take-off, Category II and III operations unless he has maintained his recency for low visibility take-off, Category II and III operations by having carried out at least three approaches and landings using approved Category II/ III procedures, at least one of which must be conducted in the helicopter, in the preceding 180 days.

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APPENDIX M

ADDITIONAL REQUIREMENTS FOR APPROVED OPERATIONS BY SINGLE ENGINE TURBINE-POWERED AEROPLANES AT NIGHT AND/OR IN INSTRUMENT METEOROLOGICAL CONDITIONS (IMC)

1 TURBINE ENGINE RELIABILITY

1.1 Turbine engine reliability shall be shown to have a world fleet power loss rate of less than 1 per 100,000 engine hours.

1.1.1 Power loss rate should be determined as a moving average over a specified period (e.g. a 12-month moving average if the sample is large). Power loss rate, rather than in-flight shut-down rate, is used as it is considered to be more appropriate for single-engine aeroplane.

1.1.2 In determining power loss rate the actual period selected should reflect the global utilisation and the relevance of the experience included (e.g. early data may not be relevant due to subsequent mandatory modifications which affected the power loss rate) After the introduction of a new engine variant and whilst global utilisation is relatively low, the total available experience may have to be used to try to achieve a statistically meaningful average.

Note:- *Power loss in this context is defined as any loss of power, the cause of which may be traced to faulty engine or engine component design or installation, including design or installation of the fuel ancillary or engine control systems.*

1.1.3 A reliability programme should be established covering the engine and associated systems. The engine programme should include engine hours flown in the period and in-flight shutdown rate for all causes and the unscheduled engine removal rate, both on a 12-month moving average basis. The event reporting process should cover all items relevant to the ability to operate safely at night and/or IMC. Any sustained adverse trend should result in an immediate evaluation by the operator in consultation with the Authority and the manufacturer with a view to determining actions to restore the intended safety level. The operator should develop a parts control programme with support from the manufacturer that ensures that the proper parts and configuration are maintained for single engine turbine-powered aeroplanes approved to conduct these operations. The programme includes verification that parts placed on an approved single engine turbine-powered aeroplane during parts borrowing or pooling arrangements, as well as those parts used after repair or overhaul, maintain the necessary configuration of that aeroplane approved for single engine operations.

1.1.4 In assessing turbine engine reliability, evidence should be derived from world fleet database covering as large a sample as possible of operations considered to be representative. Data from engine trend monitoring and event reports should also be monitored to ensure that there is no indication that the operator’s experience is unsatisfactory.

1.2 The operator shall be responsible for engine trend monitoring which should include the following:

(a) An oil consumption monitoring programme based on manufacturers' recommendations; and

(b) An engine condition monitoring programme describing the parameters to be monitored, the method of the data collection and corrective action process, based on the manufacturer's recommendations. The monitoring is intended to detect turbine engine deterioration at an early stage before safe operation is affected.

1.3 To minimise the probability of in-flight engine failure, the engine shall be equipped with:

(a) An ignition system that activates automatically, or is capable of being operated manually, for take-off and landing, and during flight in visible moisture;

(b) A magnetic particle detection or equivalent system that monitors the engine, accessories gearbox and reduction gearbox, and which includes a flight deck caution indication; and

(c) An emergency engine power control device that permits continuing operation of the engine through a sufficient power range to safely complete the flight in the event of any reasonably probable failure of the fuel control unit.

2 SYSTEMS AND EQUIPMENT

2.1 Single-engine turbine-powered aeroplanes approved to operate at night and/or in IMC shall be equipped with the following systems and equipment intended to ensure continued safe flight and to assist in achieving a safe forced landing after an engine failure, under all allowable operating conditions:

(a) Two separate electrical generating systems, each one capable of supplying all probable combinations of continuous in-flight electrical loads for instruments, equipment and systems required at night and/or in IMC;

(b) A radio altimeter;

(c) An emergency electrical supply system of sufficient capacity and endurance following loss of all generated power to, as a minimum:

(i) Maintain the operation of all essential flight instruments, communication and

(ii) Navigation systems during a descent from the maximum certificated altitude in a glide configuration to the completion of a landing;

(iii) Lower the flaps and landing gear, if applicable;

(iv) Provide power to one pitot heater, which must serve an air speed indicator clearly visible to the pilot;

(v) Provide for operation of the landing light specified in sub- paragraph (j) below;

(vi) Provide engine restart, if applicable; and

(vii) Provide for the operation of the radio altimeter;

(d) Two attitude indicators, powered from independent sources;

(e) A means to provide for at least one attempt at engine re-start;

(f) Airborne weather radar;

(g) A certified area navigation system capable of being programmed with the positions of aerodromes and safe forced landing areas, and providing instantly available track and distance information to those locations;

(h) For passenger operations, passenger seats and mounts which meet dynamically-tested performance standards and which are fitted with a shoulder harness or a safety belt with a diagonal shoulder strap for each passenger seat;

(i) In pressurised aeroplanes, sufficient supplemental oxygen for all occupants for descent following engine failure at the maximum glide performance from the maximum certificated altitude to an altitude at which supplemental oxygen is no longer required;

(j) A landing light that is independent of the landing gear and is capable of adequately illuminating the touchdown area in a night forced landing; and

(k) An engine fire warning system.

3 OPERATIONAL AND MAINTENANCE PROGRAMME REQUIREMENTS

3.1 The approval to undertake operations by single-engine turbine-powered aeroplanes at night and/ or in IMC specified in the air operator certificate will include the particular airframe/ engine combinations, including the current type design standard for such operations, the specific aeroplane approved, and the areas or routes of such operations.

3.2 The operator's maintenance control manual shall include a statement of certification of the additional equipment required, and of the maintenance and reliability programme for such equipment, including the engine.

4 OPERATIONS MANUAL AND ROUTE PLANNING

4.1 The flight manual shall include limitations, procedures, approval status and other information relevant to operations by single-engine turbine-powered aeroplanes at night and/or in IMC.

4.2 The operations manual shall include all necessary information relevant to operations by single-engine turbine-powered aeroplanes at night and/ or IMC. This shall include all of the additional equipment, procedures and training required for such operations, route and/ or area of operation and aerodrome information (including planning and operating minima).

4.3 Route planning should take account of all relevant information in the assessment of intended routes or areas of operations, including the following:

(a) The nature of the terrain to be flown, including the potential for carrying out a safe forced landing in the event of an engine failure or major malfunction;

(b) Weather information, including seasonal and other adverse meteorological influences that may affect the flight; and

(c) Other criteria and limitations as specified by the authority.

4.4 An operator should identify aerodromes or safe forced landing areas available for use in the event of engine failure, and the position of these shall be programmed into the area navigation system.

Note 1:- *A safe forced landing in this context means a landing in which it can reasonably be expected that it will not lead to serious injury or loss of life, even though the aeroplane may incur extensive damage.*

Note 2:- *Operation over routes and in weather conditions that permit a safe forced landing in the event of an engine failure, as specified in Chapter 2 paragraph 27.1, is not required by paragraphs 4 .3 and 4.4 above for aeroplanes approved in accordance with Chapter 2 paragraph 27.2. The availability of forced landing areas at all points along a route is not specified for these aeroplanes because of the very high engine reliability, additional systems and operational equipment, procedures and training requirements specified in this Appendix.*

5 ROUTE LIMITATIONS OVER WATER

5.1 Operators of single-engine turbine-powered aeroplanes carrying out operations at night and/or in IMC should make an assessment of the route limitations over water. The distance from an area suitable for forced landing/ ditching that the aeroplane may be operated should be determined, which equates to the glide distance from the cruise altitude to the forced landing area, following engine failure, assuming still air conditions. Additional distance may be included taking into account the likely prevailing conditions and the type of operation. This should include considerations for sea conditions, the survival equipment carried, the achieved engine reliability and the search rescue services available.

5.2 Any additional distance allowed beyond the glide distance should not exceed a distance equivalent to 15 minutes at the aeroplane's normal cruise speed.

6 MINIMUM EQUIPMENT LIST

6.1 The minimum equipment list of an operator approved in accordance with AOCR Chapter2 paragraph 27. 2 shall specify the operating equipment required for night and/ or IMC operations, and for day/VMC operations.

7 EVENT REPORTING

7.1 An operator approved for operations by single-engine turbine-powered aeroplanes at night and/or in IMC shall report all significant failures, malfunctions or defects to the Authority.

8 OPERATOR CERTIFICATION OR VALIDATION

8.1 The operator shall demonstrate the ability to conduct operations by single- engine turbine-powered aeroplanes at night and/or in IMC to the Authority.

8.2 The certification process should include the operator's ability to ensure adequacy of its procedures for normal, abnormal and emergency operations, including actions following engine, systems or equipment failures. In addition to the normal requirements for operator certification or validation, the following items should be addressed in relation to operations by single-engine turbine-powered aeroplanes:

(a) Proof of the achieved engine reliability of the aeroplane engine combination referred to in paragraph 1 above;

(b) Specific and appropriate training and checking procedures including those to cover engine failure/malfunction on the ground, after take-off and en- route and descend to a forced landing from the normal cruising altitude;

(c) A maintenance programme which is extended to address the equipment and systems referred to in paragraph 2 above;

(d) An MEL modified to address the equipment and system necessary for operations at night and/or in IMC;

(e) Planning and operating minima appropriate to the operations at night and/or in IMC;

(f) Departure and arrival procedures and any route limitations;

(g) Pilot qualifications and experience; and

(h) The operations manual, including limitations, emergency procedures, approved routes or areas of operation, the MEL and normal procedures related to the equipment referred to in chapter 2 above.

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APPENDIX N

AUTOMATIC LANDING SYSTEMS, HEAD-UP DISPLAY (HUD) OR EQUIVALENT DISPLAYS AND VISION SYSTEMS

INTRODUCTION

The material in this attachment provides guidance for certified automatic landing systems, HUD or equivalent displays and vision systems intended for operational use in aeroplanes engaged in international air navigation. These systems and hybrid systems may be installed and operated to reduce workload,

improve guidance, reduce flight technical error and enhance situational awareness and/or obtain operational credits. Automatic landing systems, HUD or equivalent displays and vision systems may be installed separately or together as part of a hybrid system. Any operational credit for their use requires a specific approval from the State of the Operator.

Note 1:- *"Vision systems" is a generic term referring to the existing systems designed to provide images, i.e. Enhanced Vision Systems (EVS) , Synthetic Vision Systems (SVS) and Combined Vision Systems (CVS).*

Note 2:- *Operational credit can be granted only within the limits of the airworthiness approval.*

Note 3:- *Currently, operational credit has been given only to vision systems containing an image sensor providing a real-time image of the actual external scene on the HUD.*

Note 4:- *More detailed information and guidance on automatic landing systems, HUD or equivalent displays and vision systems is contained in the Manual of All- Weather Operations (Doc 9365) This manual should be consulted in conjunction with this attachment.*

1 HUD AND EQUIVALENT DISPLAYS

1.1 General

1.1.1 A HUD presents flight information into the pilot's forward external field of view without significantly restricting that external view.

1.1.2 Flight information should be presented on a HUD or an equivalent display, as required for the intended use.

1.2 Operational applications

1.2.1 Flight operations with a HUD can improve situational awareness by combining flight information located on head-down displays with the external view to provide pilots with more immediate awareness of relevant flight parameters and situation information while they continuously view the external scene. This improved situational awareness can also reduce errors in flight operations and improve the pilot's ability to transition between instrument and visual references as meteorological conditions change.

1.2.2 A HUD may be used to supplement conventional flight deck instrumentation or as a primary flight display if certified for this purpose.

1.2.3 An approved HUD may:

(a) Qualify for operations with reduced visibility or reduced RVR; or

(b) Replace some parts of the ground facilities such as touchdown zone and/or centre line lights.

1.2.4 The functions of a HUD may be provided by a suitable equivalent display. However, before such systems can be used, the appropriate airworthiness approval should be obtained.

1.3 HUD training

Training and recent experience requirements for operations using HUD or equivalent displays should be established by the State of the Operator. Training programmes should be approved by the State of the Operator and the implementation of the training should be subject to oversight by that State. The training should address all flight operations for which the HUD or equivalent display is used.

2 VISION SYSTEMS

2.1 General

2.1.1 Vision systems can display electronic real-time images of the actual external scene achieved through the use of image sensors, i.e. EVS, or display synthetic images, which are derived from the on-board avionic systems, i.e. SVS. Vision systems can also consist of a combination of these two systems, called combined vision systems (i.e. CVS). Such a system may display electronic real-time images of the external scene using the EVS component of the system. The information from vision systems may be displayed head-up and/or head-down. Operational credit may be granted to vision systems which are appropriately qualified.

2.1.2 Light Emitting Diode (LED) lights may not be visible to infrared- based vision systems. Operators of such vision systems will need to acquire information about the LED implementation programmes at aerodromes where they intend to operate. More details about the consequences of LED lights are contained in the Manual of All-Weather Operations (Doc 9365).

2.2 Operational applications

2.2.1 Flight operations with EVS allow the pilot to view an image of the external scene obscured by darkness or other visibility restrictions. The use of EVS will also allow acquisition of an image of the external scene earlier than with natural, unaided vision, hence providing for a smoother transition to references by natural vision. The improved acquisition of an image of the external scene may improve situational awareness. It may also qualify for operational credit if the information from the vision system is presented to the pilots in a suitable way and the necessary airworthiness approval and specific approval by the State of the Operator have been obtained for the combined system.

2.2.2 Vision system imagery may also enable pilots to detect other aircraft on the ground, terrain or obstructions on or adjacent to runways or taxiways.

2.3 Operational concepts

2.3.1 Instrument approach operations include an instrument phase and a visual phase. The instrument phase ends at the published MDA/H or DA/H unless a missed approach is initiated. Using the EVS or CVS does not change the applicable MDA/H or DA/H. The continued approach to landing from MDA/H or DA/H will be conducted using visual references. This also applies to operations with vision systems. The difference is that the visual references will be acquired by use of an EVS or CVS, natural vision or the vision system in combination with natural vision (see Figure H-1).

2.3.2 Down to a defined height in the visual segment, typically at or above 30 m (100 ft), the visual references may be acquired solely by means of the vision system. The defined height depends on the airworthiness approval and specific approval by the State of the Operator. Below this height, the visual references should be solely based on natural vision. In the most advanced applications, the vision system may be used down to touchdown without the requirement for natural vision acquisition of visual references. This means that such a vision system may be the sole means of acquiring visual references and can be used without natural vision.

2.4 Vision systems training

Training and recent experience requirements should be established by the State of the Operator. Training programmes should be approved by the State of the Operator and the implementation of the training should be subject to oversight by that State.

Training should address all flight operations for which the vision system is used.

2.5 Visual references

2.5.1 In principle, the required visual references do not change due to the use of an EVS or CVS, but those references are allowed to be acquired by means of either vision system until a certain height during the approach as described in 2.3.1.

2.5.2 In States that have developed requirements for operations with vision systems, the use of visual references have been regulated and examples of this are provided in the Manual of All- Weather Operations (Doc 9365).

3 HYBRID SYSTEMS

A hybrid system generically means that two or more systems are combined. The hybrid system typically has improved performance compared to each of the component systems, which in turn may qualify for operational credit. The inclusion of more systems in the hybrid system normally enhances the performance of the system. The Manual of All-Weather Operations (Doc 9365) contains some examples of hybrid systems.

4 OPERATIONAL CREDITS

4.1 Aerodrome operating minima are expressed in terms of minimum visibility/ RVR and MDA/ H or DA/ H. When aerodrome operating minima are established, the combined capability of the aeroplane's equipment and on- ground infrastructure should be taken into account. Better equipped aeroplanes may be able to operate into lower natural visibility conditions, lower DA/H and/or operate with less ground infrastructure. Operational credit means that the aerodrome operating minima may be reduced in case of suitably equipped aeroplanes. Another way to grant operational credit is to allow visibility requirements to be fulfilled, wholly or partly, by means of the on-board systems. HUD, automatic landing or vision systems, which were not available at the time when the criteria for aerodrome operating minima were originally established.

EVS operations

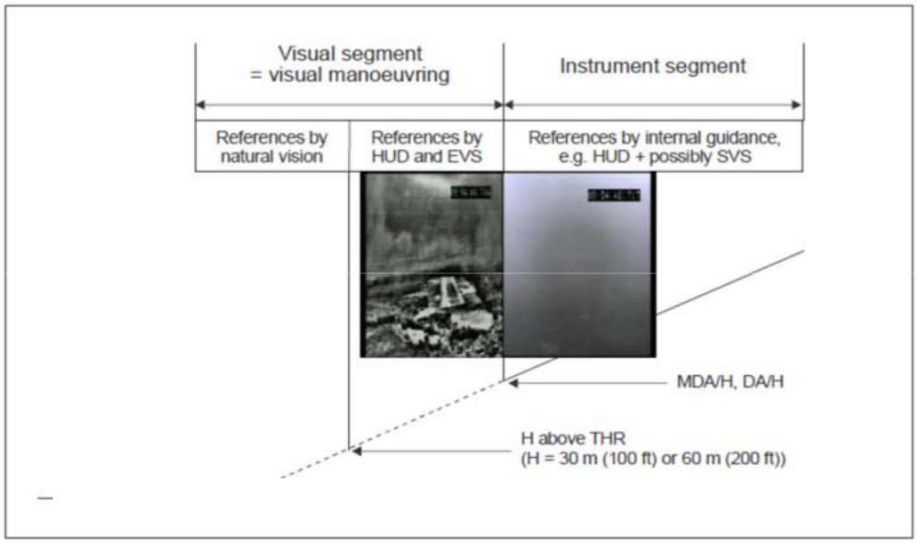

Figure 1 H-1. EVS Operations - Transition from Instrument to Visual

4.2 The granting of operational credits does not affect the classification (i.e. Type or Category) of an instrument approach procedure since they are designed to support instrument approach operations conducted using aeroplanes with the minimum equipment prescribed.

4.3 The relation between the procedure design and the operation can be described as follows. The OCA/H is the end product of the procedure design which does not contain any RVR or visibility values. Based on the OCA/H and all the other elements such as available runway visual aids, the operator will establish MDA/H or DA/H and RVR/visibility, i.e. the aerodrome operating minima. The values derived should not be less than those prescribed by the State of the Aerodrome.

5 OPERATIONAL PROCEDURES

5.1 In proving the operational use of automatic landing system, a HUD or equivalent displays, The operator shall;

(a) Ensure that the equipment meets the appropriate airworthiness certification requirements;

(b) Carried out a safety risk assessment of the operations supports by the automatic landing systems, a HUD or equivalent displays;

(c) Established and documented the procedures for the use of, and training requirements for, automatic landing systems, a HUD or equivalent displays.

5.2 In accordance with paragraph 5.1, the operator should develop suitable operational procedures associated with the use of an automatic landing system, a HUD or an equivalent

display, vision systems and hybrid systems. These procedures should be included in the operations manual and cover at least the following:

(a) Limitations;

(b) Operational credits;

(c) Flight planning;

(d) Ground and airborne operations;

(e) Crew resource management;

(f) Standard operating procedures; and

(g) ATS flight plans and communication.

6 APPROVALS

6.1 General

Note:- *When the application for a specific approval relates to operational credits for systems not including a vision system, the guidance on approvals in this attachment may be used to the extent applicable as determined by the State of the Operator.*

6.1.1 Where aeroplanes are equipped with automatic landing systems, a HUD or equivalent displays, or any combination of those systems into a hybrid system, the use of such system for the safe operation of an aeroplane shall be approved by the Authority.

6.1.2 The operator that wishes to conduct operations with an automatic landing system, a HUD or an equivalent display, a vision system or a hybrid system will need to obtain certain approvals as prescribed in the relevant SARPs. The extent of the approvals will depend on the intended operation and the complexity of the equipment.

6.1.3 Systems that are not used for an operational credit or otherwise critical to the aerodrome operating minima, e. g. vision systems used to enhance situational awareness may be used without a specific approval. However, the standard operating procedures for these systems should be specified in the operations manual. An example of this type of operation may include an EVS or an SVS on a head-down display that is used only for situational awareness of the surrounding area of the aeroplane during ground operations where the display is not in the pilot's primary field of view. For enhanced situational awareness, the installation and operational procedures need to ensure that the operation of the vision system does not interfere with normal procedures or the operation or use of other aeroplane systems. In some cases, modifications to these normal procedures for other aeroplane systems or equipment may be necessary to ensure compatibility.

6.1.4 The Standard in paragraph 6.1.1, requires that the use of an automatic landing system, a HUD or an equivalent display, EVS, SVS or CVS or any combination of those systems into a hybrid system, should be approved by the State of the Operator when those systems are used "for the safe operation of an aeroplane". When operational credits are granted by the State of the Operator as per the Standard in Chapter 2, paragraph 13, the use of that system becomes essential for the safety of such operations and is subject to a specific

approval. The use of these systems solely for enhanced situational awareness, reduced flight technical error and/ or reduced workload is an important safety feature, but does not require a specific approval.

6.1.5 Any operational credit that has been granted should be reflected in the operation specifications for the type or individual aeroplane as applicable.

6.2 Specific approvals for operational credit

6.2.1 To obtain a specific approval for operational credit, the operator will need to specify the desired operational credit and submit a suitable application. The content of a suitable application should include:

(a) Applicant details. The AOC holder's company name, AOC number and email.

(b) Aircraft details. Aircraft make(s), model(s) and registration mark(s).

(c) Operator's vision system compliance list. The contents of the compliance list are included in the Manual of All-Weather Operations (Doc 9365). The compliance list should include the information that is relevant to the specific approval requested and the registration marks of the aircraft involved. If more than one type of aircraft/ fleet is included in a single application, a completed compliance list should be included for each aircraft/fleet.

(d) Documents to be included with the application. Copies of all documents to which the operator has made references should be included in the application. There should be no need to send complete manuals; only the relevant sections/pages should be required. Additional guidance material can be found in the Manual of All-Weather Operations (Doc 9365).

(e) Name, title and signature.

6.2.2 The following items should be covered in a vision systems compliance list:

(a) Reference documents used in compiling the submission for approval;

(b) Flight manual;

(c) Feedback and reporting of significant problems;

(d) Requested operational credit and resulting aerodrome operating minima;

(e) Operations manual entries including MEL and standard operating procedures;

(f) Safety risk assessments;

(g) Training programmes; and

(h) Continuing airworthiness.

Expanded guidance on these items is contained in the Manual of All-Weather Operations (Doc 9365).

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APPENDIX O

OPERATIONAL CONTROL

1 OPERATIONAL CONTROL FUNCTIONS

1.1 The operator exercises operational control by making those decisions and performing those actions on a daily basis that are necessary to operate flights safely and in compliance with the regulations. Operational control functions include crew and aircraft scheduling, accepting charter flights from the public, reviewing weather and Notices to Airmen (NOTAM), and flight planning. Another aspect consists of developing and publishing flight control policies and procedures for flight crews and other operations personnel to follow in the performance of their duties.

1.2 The operators are responsible for collecting and disseminating information that is needed to plan and conduct flights safely, including information about enroute and terminal weather conditions, navigation, and aerodrome facilities.

1.3 An operational control function may be centralised in one individual or diversified throughout an operator's organization. In practice, it is not feasible for an individual to exercise operational control without assistance in any but the simplest of flight operations. Most operators create specialised departments for crew scheduling, load control, and other functions. These functions may or may not be placed under the management and supervision of the "Flight Control" department. When these functions are delegated to specialized sections of the operator's organisation, the operator is responsible for the following:

(a) Establishing a means to ensure that all functions have been accomplished before a flight can be authorised to depart;

(b) Establish effective internal communications, operating procedures, and administrative controls to meet this obligation;

(c) Ensuring that these procedures are published in the operator's operations manual; and

(d) Ensuring that all subcontracted activities are carried out in adherence with its policies and procedures and that its sub-contractors provide timely notification to the AOC holder of any irregularities that will affect the safety and operational statues of an aircraft or a flight.

1.4 Responsibility for operational control shall be delegated only to the Pilot-In-Command and to a flight operations officer/flight dispatcher if the operator's approved method of control and supervision of flight operations requires the use of flight operations officer/flight dispatcher personnel.

1.5 The personnel authorized to exercise operational control may delegate certain operational control functions to other individuals, but he or she cannot delegate the responsibility for those functions.

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2 OPERATIONAL CONTROL SYSTEMS

2.1 The operator shall establish and maintain a system for exercising operational control over any flight operated under the terms of its AOC, and relevant to the authorization or declaration.

2.2 Operational control systems vary with the kind of operations the operator is authorized to conduct, the complexity of the operations, the means of communication, and the persons who are involved in preparing for and conducting flights under the operator's system.

2.3 The operator should have adequate contingency plans for dealing with non-routine operations. for example, when adverse weather moves across an area and ATC begins rerouting traffic, a flight operations officer/flight dispatcher and/or other designated personnel workload can increase to several times the routine level.

3 OPERATOR QUALITY ASSURANCE RESPONSIBILITY

3.1 The operator's safety and quality assurance responsibility include ensuring that both its flight crew and operational control employees comply with published policies and procedures.

4 AOC HOLDER'S OPERATIONS MANUAL

4.1 The Operator prepares and keeps the current manual for the guidance of flight, ground, and management personnel in the performance of their duties and responsibilities. The operator shall include in its Operations Manual the duties and responsibilities of those persons to whom authority to exercise operational control has been delegated, providing the name of each manager responsible for flight operations (operational control) including a description of their duties and functions.

4.2 The operations manual shall contain policies and procedures regarding the operational control functions of flight crews, flight operations officer/flight dispatcher, and other designated personnel to exercise operational control functions.

4.3 The operator shall establish the guidelines and procedures to ensure flight operations officer/flight dispatcher and other designated personnel notifies the appropriate authority in the quickest manner of any accident involving an aircraft that results in a fatal or serious injury to any person or substantial damage to the aircraft or property.

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5 SPECIFIC OPERATIONAL FUNCTIONS

5.1 Operational control includes, but is not limited to, the operator's performance of the following functions:

(a) Ensuring that only those operations authorized by the AOC are conducted;

(b) Ensuring that only crewmembers trained and qualified in accordance with the applicable regulations are assigned to conduct a flight;

(c) Ensuring that crewmembers are in compliance with flight and duty time limitations requirements when departing on a flight;

(d) Designating a PIC for each flight;

(e) Providing the personnel who perform operational control functions (PIC, flight operations officer/ flight dispatcher, etc.) with access to all necessary information for the safe conduct of the flight (e.g., weather, NOTAM, airport aeronautical data (analysis), and inoperable instruments and equipment);

(f) Specifying the conditions under which a flight may be released (weather minima, flight planning, airworthiness of aircraft, aircraft loading, and fuel requirements).

(g) Ensuring that each flight has complied with the conditions specified for release before it is allowed to depart.

(h) Ensuring that when the conditions specified for a flight's release cannot be met, the flight is either cancelled, delayed, re-routed, or diverted;

(i) Monitoring the progress of each flight and initiating timely actions when the flight cannot be completed as planned, including diverting or terminating a flight;

(j) Pre flight planning and Preparation and Dissemination of dispatch/flight releases;

(k) Cancelling a flight due to potentially hazardous or unsafe conditions;

(l) Ensuring that each flight is operated in accordance with the limitations of the MEL and CDL;

(m) Ensuring acceptable means of communications in accordance with a two-way communication system, or other means of communication under normal operating conditions between each aircraft and the appropriate operations control office;

(n) When the operator conducting the flight knows of conditions, including airport and runway conditions, that are a hazard to safe operations, it shall restrict or suspend operations until those conditions are corrected;

(o) Ensuring that the flight operations officer/ flight dispatcher and/or other designated personnel has the guidance and procedure for exercising emergency events.

5.2 If the Operator transports dangerous goods as cargo, the operator shall ensure that flight operations officer/flight dispatcher or other designated personnel:

(a) Have access to the same information pertaining to dangerous goods carried as cargo on board the aircraft that is provided to the PIC; and

(b) Are assigned the responsibility to provide detailed information without delay about dangerous goods carried as cargo to emergency services responding to an accident or serious incident involving the operator's aircraft.

5.3 AERONAUTICAL DATA

5.3.1 The operator shall be provided the information necessary to plan, conduct, and control flight operations. The information shall be available to flight crews, flight operations officers /flight dispatchers, and/or other designated personnel to exercise operational control. Most of this information can be obtained through subscriptions to a government service or to commercial aeronautical information and charting service providers. The operator should be expected to supplement these services when necessary and, in all cases, are responsible for ensuring that the information used is accurate and complete.

5.3.2 The operators shall describe a system of obtaining and distributing airport aeronautical data in the manuals. The operator’s system shall contain guidance and procedures by which flight crew, flight operations officers /flight dispatchers, and/or other designated personnel can acquire and apply this information.

5.4 AIRPORT AND FACILITIES

5.4.1 The operator shall ensure this information available to flight crews, flight operations officers /flight dispatchers, and/or other designated personnel. Information should contain in an airport and facilities information include, but are not limited to:

(a) Types of Navigational Aids (NAVAID);

(b) Airport hours of operations;

(c) Communications;

(d) Weather sources;

(e) Type of airspace;

(f) Aircraft Rescue and Fire Fighting (ARFF);

(g) Types of available fuel;

(h) Runway bearing strength;

(i) Airport lighting; and

(j) Special notices and operational procedures.

5.5 NOTAM

5.5.1 The operator shall have a method of providing NOTAMs to flight crews, flight operations officers /flight dispatchers, and/or other designated personnel for domestic and international operations covered by NOTAM systems. NOTAMs include information such as:

(a) Airport or aerodrome closures;

(b) Runway, taxiway, and ramp closures;

(c) Temporary or permanent obstructions;

(d) Inoperative communication facilities;

(e) Inoperative or unmonitored NAVAIDs;

(f) Airspace restrictions and changes;

(g) Changes to or inoperative satellite equipment; and

(h) Radar service availability.

5.6 AIRCRAFT PERFORMANCE AND AIRPORT OBSTACLE DATA

5.6.1 The operator shall obtain and use the airport obstacle data to calculate take off and landing performance for departure, destination, and alternate airports.

5.6.2 The operator shall comply with enroute obstacle clearance requirements, including contingency planning for engine failure.

5.7 WEATHER INFORMATION FOR CONTROL OF FLIGHT OPERATIONS.

5.7.1 The operator shall have adequate weather reporting facilities and procedures to use the approved sources of weather reports and forecasts to control flight operations.

5.7.2 The operator shall have a system or method of obtaining reports and forecasts of adverse weather phenomena. Adverse weather phenomena are meteorological conditions that, if encountered during flight or ground operations, could reduce and even threaten the safety of those operations. Examples of adverse weather phenomena include, but are not limited to:

(a) Thunderstorms;

(b) Icing;

(c) Low-altitude wind shear;

(d) Turbulence;

(e) Natural hazards such as volcanic ash; and

(f) Any meteorological condition that could cause contamination of a runway or other take off surface and directly affect aircraft performance.

5.8. FLIGHT PLANNING.

5.8.1 The operator shall ensure that flight planning has met at least the following requirements:

(a) Adheres to the standards of navigational accuracy required in the airspace traversed;

(b) Meets regulatory and company fuel requirements;

(c) Meets aircraft performance parameters;

(d) Satisfies ATC information and reporting requirements;

(e) Satisfies drift down and supplemental oxygen requirements, where applicable; and

(f) Ensures a safe operating environment.

Note: *The degree of sophistication required in flight planning depends on the type of operations (e.g., domestic, international Extended Operations (ETOPS), re-dispatch/rerelease), navigation conducted, and airspace traversed.*

5.8.2 Operational Flight Plan and ATS Flight Plan, for details refer to chapter 5, paragraph 11

5.8.3 The operator's manual shall contain specific policies, procedures, formats, and forms to be used for flight planning.

5.8.4 The operator shall verify that policies and procedures contain a requirement for flight crew, flight operations officers /flight dispatchers, and/or other designated personnel to verify the accuracy of operational flight plans.

5.8.5 The operator shall ensure that the operations control function has a method to substantiate the estimated fuel performance for any given flight. Substantiation of fuel performance may be as simple as comparing the planned arrival fuel with the actual arrival fuel to see if the actual fuel burned enroute was correctly estimated in the operational flight plan calculation.

5.9 FLIGHT PREPARATION

5.9.1 The operator shall establish the procedure for flight preparation in accordance with chapter 5, paragraph 11.

5.9.2 The Pilot-In-Command (PIC) shall be advised on details about the airworthiness of the aircraft. Information such as the below should preferably be via the technical log:

(a) When the next Scheduled Maintenance is due, by flying hours and calendar time;

(b) Any defects existing on the aircraft affecting its operational airworthiness and safety; and

(c) Any maintenance actions due before the next Scheduled Maintenance.

5.9.3 The operator should provide any other information to the crew member concerning the aircraft and its systems, including changes resulting from modifications, which may affect the operation of the aircraft.

5.10 SELECTION OF ALTERNATE AIRPORTS.

5.10.1 The operator shall establish specific direction and guidance to PICs, flight operations officers /flight dispatchers, and/or other designated personnel for the selection of take off, enroute, and destination alternate airports.

5.10.2 The operator shall ensure that procedures for operations to alternate airports comply with specific approval or Operations Specifications.

PIC, Flight operations officers /flight dispatchers, and/or other designated personnel shall be aware of the effect of weather conditions, inoperative NAVAIDs, and airport conditions when selecting alternate airports. Inoperative NAVAIDs, shifts in wind direction, contaminated runways, or closed runways can all render an airport unacceptable as an alternate.

5.11 WEIGHT AND BALANCE CONTROL.

5.11.1 The operator shall have a means of adequately planning payload and limiting it if necessary when hazardous weather and/or enroute conditions dictate the need to carry additional fuel, or when restrictions posed by runway conditions, terrain, altitude, or inoperable instruments or equipment require the aircraft to be operated at restricted weights. The weight at which an aircraft can be released is limited by take off, enroute terrain clearance, and landing performance limitations specified in AFM.

5.11.2 Loading Assumptions.

Flight operations officers /flight dispatchers and/or other designated personnel shall take into account the estimated or actual payload when calculating (or computing) a flight plan. When working with an estimated payload, flight dispatchers and/or other designated personnel to exercise operational control shall be prepared to revise the flight plan and amend the dispatch/flight release, as necessary, upon discovery of the actual payload when it varies significantly from that which was estimated.

5.11.3 The operators shall provide the guidance on what constitutes a significant variance in the payload to flight crews, flight operations officers /flight dispatchers, and/or other designated personnel to exercise operational control actually include weight adjustments in specific documents on flight plans and/or Weight and Balance (W&B) documents.

5.11.4 The operator shall ensure that the operations manuals contain information and procedures for the computation and control of fuel loads, payloads, take off weights, aircraft centre of gravity (CG). And manual shall clearly delineate the category of employees (e.g., dispatcher, load planner, etc.) making these computations. The operations manual(s) shall contain adequate information and procedures for employees performing these calculations, and methods to ensure that they are calculated accurately and all necessary calculations have been completed accurately before an aircraft departs.

5.12 OPERATIONAL INFORMATION AND FORMS TO BE CARRIED

The operator shall ensure that all the following documents are carried on board every flight:

(a) Operations Manual;

(b) Aircraft Operating Manual or Flight Crew Operating Manual;

(c) Aircraft Flight Manual;

(d) Airport Performance Data;

(e) Minimum Equipment List / Configuration Deviation List;

(f) Standard Operating Procedure and Checklists for Normal, Abnormal and Emergency Procedures;

(g) Technical Log;

(h) Load Sheet or Weight and Balance Report;

(i) Passenger and/or Cargo Manifests;

(j) Operational Flight Plan;

(k) A Copy of The ATS Flight Plan;

(l) Route-specific NOTAM and AIS briefing documentation;

(m) Meteorological information appropriate to the flight;

(n) Current and Suitable Aeronautical Charts to cover the route of the proposed flight and any route along which it is reasonable to expect that the flight may be diverted;

(o) Any information on Search and Rescue Services covering the route of the proposed flight;

(p) Information concerning any dangerous goods that are on board the aircraft, if applicable;

(q) A copy of the procedures to be followed by the Pilot-in Command of an intercepted aircraft, as published in an official publication by the AIS provider (such as an AIC, AIP or NOTAM);

(r) A copy of the visual signals for use by intercepting and intercepted aircraft, as published in an official publication by The AIS Provider (Such as an AIC, AIP or NOTAM);

(s) Aircraft Bomb Search Procedure Checklist.

6 COMMUNICATION

6.1 The operators should establish a process or procedures to record communication between PIC and operational control for each flight. This applies to all communication system utilized by the operator.

6.2 The operator should specify the minimum information each flight should record. The most common and preferred practice is for an operator to record electronically or manually. Each communication record should contain at least the following information:

(a) The date and time (specify the universal coordinated time (UTC)) of the contact (communication). This should include the time the contact was initiated and the time the contract was concluded;

(b) The flight number or call sign.;

(c) Aircraft registration number; and

(d) Approximate position (e.g., closest WPT or NAVAID) of the aircraft during the contact.

7 DISPATCH/FLIGHT RELEASE.

7.1 The flight may not depart from the point of origin unless a dispatch release contains specific authorization for the flight between specified points. The dispatch/flight release may be for a single flight or for a series of flights with intermediate stops. A dispatch/flight release form shall be completed and signed both PIC and/or Flight Operations Officer/Flight Dispatcher before each flight and specifies that a dispatch/flight release must contain at least the following information:

(a) Company or organization name.

(b) Make, model, and registration number of the aircraft.

(c) Flight number.

(d) Date of flight.

(e) Name of the pilot designated as PIC.

(f) The departure airport, destination airport, and alternate airports.

(g) Route of flight.

(h) Minimum fuel supply required by regulation at the start of each take off

(i) The type of operations (IFR or VFR);

(j) Weather reports, available weather forecasts (or a combination thereof) for the destination airport, and alternate airports that are the latest available at the time the PIC signs the flight release. (Print these on or attach them to the flight release.);

(k) For each flight released as an Extended Operations (ETOPS) flight, the ETOPS diversion time for which the flight is released; and

(l) PIC and Flight operations officers /flight dispatchers Name and Signature including License number.

7.2 Each dispatch/flight release is required to contain, or have attached to it, available weather reports or weather forecasts (or a combination thereof) for the destination airport, intermediate stops, and alternate airports that are the latest available at the time the release is signed by the PIC. Any additional weather reports or forecasts that the PIC or the flight operations officers /flight dispatchers considers necessary or desirable must be included.

7.3 The operator shall establish procedures to ensure that, when a flight has been dispatched but is unable to depart as scheduled, the weather information is updated and is the latest available at the time of actual departure (take off).

7.4 The operator shall specific procedures in the operations manual to have the Flight operations officers /flight dispatchers forward to the flight crew any new weather information which may be operationally significant as soon as practical after the aircraft departs, and while it is enroute (when applicable).

7.5 The flight shall not be released unless, considering winds and forecast weather conditions, the flight carries all of the fuel required as specified in Chapter 2, paragraph 6.2

8 FLIGHT MONITORING/FOLLOWING

8.1 A flight operations officer/flight dispatcher or other designated personnel shall monitor the progress of each flight under that operational control until the flight has landed or passed beyond the operational control's area of control, or until the flight operations officer/flight dispatcher or other designated personnel is properly relieved by another.

8.2 Flight monitoring/following, at a minimum, shall consist of the monitoring of each flight time remaining, destination and alternate airport weather trends, enroute winds and weather (including pilot reports), air traffic control (ATC) constraints, and the status of airport and navigational facilities.

8.3 Flight operations officer/flight dispatcher or other designated personnel shall report to the PIC any additional information that could affect the safety of the flight. This information may be delivered by voice message or by other means, such as the Aircraft Communications Addressing and Reporting System (ACARS) as appropriate.

9 RETENTION SYSTEM

9.1 The Operator shall establish a system for the management and control of operational control records to ensure the content and retention of such records are retained for the period minimum 3 months, and to ensure operational records are subjected to standardized processes for:

(a) Identification;

(b) Legibility;

(c) Maintenance;

(d) Retention and retrieval;

(e) Protection and security;

(f) Disposal, deletion (electronic records), and archiving.

9.2 The retention system should ensure that all records are accessible whenever needed within a reasonable time. These records should be organised in a way that ensures traceability and retrievability throughout the required retention period.

9.3 Records should be kept in paper form or in electronic format or a combination of both media. Records stored on microfilm or optical disc form are also acceptable. The records should remain legible and accessible throughout the required retention period. The retention period starts when the record has been created.

9.4 The Operator should have a process or procedures to retain operational information, communications, and data for each flight. As a minimum, such retained flight information and data shall be in accordance with the specifications following information:

(a) Aircraft registration;

(b) Date;

(c) Flight number;

(d) Flight crew names and duty assignment;

(e) Fuel on board at departure, en route and arrival;

(f) Departure and arrival point;

(g) The actual time of departure;

(h) The actual time of arrival;

(i) Flight time;

(j) Incidents and observations, if applicable;

(k) Flight weather briefings;

(l) flight releases or equivalent document;

(m) Load Sheet or Weight and Balance report;

(n) Passenger and/or Cargo Manifest, if applicable.

(o) NOTOC; if applicable

(p) A signed copy of the Operational flight plan or equivalent document, as specified;

(q) ATS flight plan;

(r) Communications records;

(s) Fuel and oil records

(t) Aircraft tracking data to assist SAR in determining the last known position of the aircraft.

(u) Etc.

10 SUBCONTRACTORS OR SERVICES PROVIDER

10.1 The operator may contract for certain equipment, services, and facilities under any circumstances, contract responsibility for operational control. The operator may arrange to have flight following facilities provided by persons other than its employees in accordance with subcontractor or service provider agreements. However, all operational control responsibilities remain with the operators at all times.

10.2 The operator is always responsible for ensuring that the training and qualification of contract personnel meet all regulatory requirements, and that contract personnel are performing their duties in accordance with the operator's policies and procedures.

10.3 The operator shall establish an effective means of maintaining responsibility for the actions and/or inactions of contract personnel should they fail to comply with authority regulations or the operator's policies and procedures. All contract arrangements must be clearly and completely defined in the operator's manual.

APPENDIX P

MAINTENANCE AGREEMENT

1 Where an operator chooses to contract maintenance to another organisation, a written agreement must be drawn up indicating the divisions of responsibility between the two parties for the overall support of the aircraft and for compliance with statutory regulations and other relevant requirements.

2 The purpose of the agreement is to demonstrate a firm commitment by the two parties to the maintenance support of the aircraft in the operation for which application has been made for an Air Operator's Certificate.

3 It is strongly recommended that the portions of the agreement dealing with maintenance identify clearly those tasks which are to be accomplished by the contractor and those tasks which will remain the responsibility of the operator. This is particularly necessary where for example, the operator retains responsibility for line maintenance or spares provision.

4 The agreement should address the following matters:

(a) General arrangements for support of the operation by the maintenance organisation, and for technical liaison between operator and Maintenance Organisation;

(b) Accomplishment of maintenance at the approved locations of the maintenance organisation;

(c) Provision of appropriately approved/licensed maintenance personnel sufficient in numbers for the completion and certification of scheduled maintenance, the rectification of defects and the completion of duplicate inspections;

(d) Training of maintenance personnel and, where necessary, the operator's flight crews;

(e) Arrangements for line maintenance and ground handling at the operator's route stations, including major unscheduled arising such as engine changes and defects requiring major dismantling or jacking;

(f) Control and development of the Maintenance Schedule in response to service experience and manufacturers recommendations, the management and operation of reliability programmes, the preparation of documentation needed to implement the schedule and the arrangements for granting variations to the maintenance schedule requirements;

(g) Airworthiness occurrence control and reporting to the manufacturer and the Authority including MOR, and the control of deferred and repetitive defects;

(h) Maintaining logbooks, component service history, maintenance and other technical records and the transmission of Sector Record page information from the operator to the maintenance organisation;

(i) Manufacturer's Service Bulletins/Information received, assessed and incorporated into modifications and manufacturer's technical programmes;

(j) Compliance with mandatory requirements including mandatory modifications and inspections, and Airworthiness Directives, and for responding to other maintenance and airworthiness requirements published by the responsible Authorities;

(k) Provision of spares, their storage and acceptance;

(l) Ensuring the availability of the necessary tools and equipment to complete the scheduled maintenance and any other work arising under the terms of the agreement;

(m) Provision of suitable maintenance accommodation at all locations where maintenance take place, appropriate to the task; and

(n) Quality auditing of the maintenance arrangements, including in particular the systems and procedures employed to achieve the control of airworthiness, at main base, line stations and en-route wherever support and ground handling takes place.

5 Details of the financial aspect of maintenance agreements may be omitted.

APPENDIX Q

QUALITY MANAGEMENT SYSTEM

The operator shall establish a quality management system with the objective of compliance monitoring and designated Head of Quality to monitor the compliance with, and adequacy of, procedures required to ensure safe operational practices and airworthy aircraft.

The compliance monitoring shall include a direct feedback system of findings to the accountable manager to ensure effective implementation of corrective actions as necessary.

1 COMPLIANCE MONITORING

1.1 The implementation and use of a compliance monitoring function shall enable the operator to monitor compliance with the relevant requirements of this AOCR and other applicable regulatory requirements.

(a) The operator should specify the basic structure of the compliance monitoring function applicable to the activities conducted.

(b) The compliance monitoring function should be structured according to the size of the operator and the complexity of the activities to be monitored.

1.2 The operator shall monitor compliance with the procedures they have designed to ensure safe activities. In doing so, they should as a minimum, and where appropriate, monitor compliance with:

(a) Privileges of the operator;

(b) Manuals, logs, and records;

(c) Training standards; and

(d) Management system procedures.

2 ORGANISATIONAL SETUP

2.1 To ensure that the operator continues to meet the requirements, the Accountable Manager should designate a Head of Quality. The role of the Head of Quality is to ensure that the activities of the operator are monitored for compliance with applicable regulatory requirements, and any additional requirements as established by the operator, and that these activities are carried out properly under the supervision of the relevant head of the functional area.

2.2 The Head of Quality shall be responsible for ensuring that the compliance monitoring program is properly implemented, maintained, and continually reviewed and improved.

2.3 The Head of Quality should:

(a) Have direct access to the accountable manager;

(b) Be able to demonstrate relevant knowledge, background and appropriate experience related to the activities of the operator, including knowledge in quality management system and experience in compliance monitoring; and

(c) Have access to all parts of the operator, and as necessary, any contracted operator.

2.4 In the case the same person acts as Head of Quality and as Head of Safety, the accountable manager, with regards to his/her direct accountability for safety, should ensure that sufficient resources are allocated to both functions, taking into account the size of the operator and the nature and complexity of its activities.

2.5 The independence of the compliance monitoring function should be established by ensuring that audits and inspections are carried out by personnel who are not responsible for the function, procedure, or products being audited.

2.6 In case external personnel is used to perform compliance audits or inspections:

(a) Any such audits or inspections are performed under the responsibility of the Head of Quality; and

(b) The operator remains responsible to ensure that the external personnel have relevant knowledge, background, and experience as appropriate to the activities being audited or inspected; including knowledge and experience in compliance monitoring as defined in Appendix Q, paragraph 2.3 (b) and paragraph 2.5

2.7 The operator retains the ultimate responsibility for the effectiveness of the compliance monitoring function, in particular for the effective implementation and follow-up of all corrective actions.

2.8 Compliance monitoring documentation.

(a) Relevant compliance monitoring documentation should include the relevant part(s) of the operator's flight safety document system.

(b) The Quality Management System Manual should be accepted by the Civil Aviation Authority of Thailand and also include the following:

(i) Terminology;

(ii) Specified activity standards;

(iii) A description of the operator;

(iv) The allocation of duties and responsibilities;

(v) Procedures to ensure regulatory compliance;

(vi) The compliance monitoring program, reflecting:

(1) Schedule of the monitoring program;

(2) Audit procedures;

(3) Reporting procedures;

(4) Follow-up on corrective action procedures;

(5) Recording system;

(6) Contracting/outsourcing control process;

(vii) The training programme referred to Appendix Q, paragraph 2.8 (c) (ii);

(viii) Document control; and

(ix) Management Evaluation

(c) Training

(i) Correct and thorough training is essential to optimize compliance in every operator. In order to achieve a significant outcome of such training, the operator should ensure that all personnel understand the objectives as laid down in the operator's Quality Management System.

(ii) Personnel involved in the compliance monitoring function should receive training on this task. Such training should cover the requirements of compliance monitoring, manuals, and procedures related to the task, audit techniques, reporting, and recording.

(iii) Time should be provided to train all personnel involved in the Quality Management System and for briefing the remainder of the personnel.

(iv) The allocation of time and resources should be governed by the volume and complexity of the activities concerned.

2.9 Operators should monitor compliance with the operational procedures they have designed to ensure safe operations, airworthy aircraft, and the serviceability of both operational and safety equipment. In doing so, where appropriate, the quality management system and compliance monitoring program should cover at least all the following;

(a) Operational Procedures;

(b) Flight Safety Procedures;

(c) Operational Control and Supervision;

(d) Aircraft Performance;

(e) All-Weather Operations;

(f) Communications and Navigational Equipment and Practices;

(g) Mass and Balance, And Aircraft Loading;

(h) Instruments and Safety Equipment;

(i) Ground Operations;

(j) Flight and Duty Time Limitations, Rest Requirements, And Scheduling;

(k) Aircraft Maintenance/Operations Interface;

(l) Use of The MEL;

(m) Flight Crew;

(n) Cabin Crew;

(o) Flight Operations Officer / Flight Dispatcher

(p) Dangerous Goods;

(q) Security;

(r) Safety Management System

(s) Flight Safety Documentation System; And

(t) Contracting / Outsourcing Control

2.10 The specific requirements for the Engineering and Maintenance Quality System are detailed in Chapter 9.

APPENDIX R

LOCATION OF AN AEROPLANE IN DISTRESS

1 PURPOSE AND SCOPE

Location of an aeroplane in distress aims at establishing, to a reasonable extent, the location of an accident site within a 6 NM radius.

2 OPERATION

2.1 An aeroplane in distress shall automatically activate the transmission of information from which its position can be determined by the operator and the position information shall contain a time stamp. It shall also be possible for this transmission to be activated manually. The system used for the autonomous transmission of position information shall be capable of transmitting that information in the event of aircraft electrical power loss, at least for the expected duration of the entire flight.

Note:- *Guidance on the location of an aeroplane in distress is provided in 3 of this chapter.*

2.2 An aircraft is in a distress condition when it is in a state that, if the aircraft behavior event is left uncorrected, can result in an accident. Autonomous transmission of position information shall be active when an aircraft is in a distress condition. This will provide a high probability of locating an accident site to within a 6 NM radius. The operator shall be alerted when an aircraft is in a distress condition with an acceptable low rate of false alerts. In case of a triggered transmission system, initial transmission of position information shall commence immediately or no later than five seconds after the detection of the activation event.

Note 1:- *Aircraft behavior events can include, but are not limited to, unusual attitudes, unusual speed conditions, collision with terrain and total loss of thrust/propulsion on all engines and ground proximity warnings.*

Note 2:- *A distress alert can be triggered using criteria that may vary as a result of aircraft position and phase of flight. Further guidance regarding in-flight event detection and triggering criteria may be found in the EUROCAE ED-237, Minimum Aviation System Performance Specification (MASPS) for Criteria to Detect In-Flight Aircraft Distress Events to Trigger Transmission of Flight Information.*

2.3 When an aircraft operator or an Air Traffic Service Unit (ATSU) has reason to believe that an aircraft is in distress, coordination shall be established between the ATSU and the aircraft operator.

2.4 The organizations that will require the position information of an aircraft in an emergency phase. These shall include, as a minimum:

(a) Air traffic service unit(s) (ATSU); and

(b) SAR Rescue Coordination Centre(s) (RCC) and sub-centres.

Note 1:- *Refer to ICAO Annex 11 for emergency phase criteria.*

Note 2:- *Refer to ICAO Annex 12 for required notifications in the event of an emergency phase.*

2.5 When autonomous transmission of position information has been activated, it shall only be able to be deactivated using the same mechanism that activated it.

2.6 The accuracy of position information shall, as a minimum, meet the position accuracy requirements established for ELTs

3 GUIDANCE FOR LOCATION OF AN AEROPLANE IN DISTRESS

3.1 INTRODUCTION

3.1.1 The following material provides guidance on locating an aeroplane in distress. The Triggered Transmission of Flight Data Working Group (TTFDWG) reviewed forty-two accidents to determine an indication of the distance from a last-known aeroplane position to the location of an accident site. The report concluded that in approximately 95 per cent of the cases, when the aircraft position was known one minute prior to the accident, the accident site location was within a 6 NM radius of that position.

3.1.2 When an aeroplane has an accident into water and becomes submerged, the location of the accident site within a 6 NM radius on the surface becomes more important. Starting the initial search area beyond a 6 NM radius reduces the amount of time available to search for and locate the aeroplane. At current estimated underwater search capabilities of 100 km2/day, an area with a 6 NM radius could be searched in four days. Allowing for naval assets to reach the search area and conduct the search, it is estimated that an area of 2 300 km2, equivalent to a radius of 14 NM, will be able to be searched before the ULD battery degrades. Starting at an area of more than 6 NM radius reduces the probability of a successful location during an initial search, whilst extending the location requirement beyond 6 NM radius reduces the time available to search with no appreciable gain in the probability of recovery.

3.2 CLARIFICATION OF PURPOSE OF EQUIPMENT

3.2.1 Information from which a position can be determined: Information from an aircraft system which either is active, or, when automatically or manually activated, can provide position information which includes a time stamp. This is a performance-based requirement which is not system-specific and may also bring operational benefits.

3.2.2 Emergency locator transmitter (ELT): The current generation of ELTs were designed to provide the position of impact for a survivable accident. The next generation of ELTs may

have the capability to activate a transmission in flight when any of the conditions detailed in EUROCAE ED-237, Minimum Aviation System Performance Specification (MASPS) for Criteria to Detect In-Flight Aircraft Distress Events to Trigger Transmission of Flight Information are met. When an ELT sinks below the surface of water, its signal is not detectable.

3.2.3 Automatic deployable flight recorder (ADFR): The purpose of an ADFR is to have flight recorder data available soon after an accident, in particular for accidents over water. The integrated ELT provides for both locating the accident site for accident investigation and search and rescue purposes. Being floatable, it will assist in locating the accident site by providing an ELT signal when the wreckage sinks below the surface of the water. It also ensures redundancy for one ELT.

3.2.4 Underwater locator device (ULD): A ULD operating at a frequency of 8.8 kHz is attached to the airframe to locate aeroplane wreckage below the surface of water when an ELT signal is not possible to detect. The ULDs operating at 37.5 kHz are attached to the flight recorders and are used for locating the flight recorders under water.

3.3 EQUIPAGE COMPLIANCE

The advancement of technology has made it possible to meet the equipage requirements by different means. Table AE 1 below provides examples of compliance. In such potential installations, the cost will be minimized and the effectiveness of the current installation improved.

Table AE 1. Examples of Compliance

Current	After 1 January 2023
In-service	Application for type certification is submitted to a Contracting State
Two ELTs Two fixed recorders	Example: A system from which a position can be determined; and one ADFR with an integrated ELT; and one combined recorder; or A system from which a position can be determined and one ELT and two fixed recorders and an additional means to retrieve flight recorder data in a timely manner

Table AE 1 Examples of Compliance

Note:- *A system from which a position can be determined and used to comply with Chapter 10, paragraph 18, may replace one of the ELTs required by Chapter 10, paragraph 17.*

APPENDIX S

MEDICAL SUPPLIES

TYPES, NUMBER, LOCATION AND CONTENTS OF MEDICAL SUPPLIES

1 TYPES

1.1 The different types of medical supplies should be provided as follows: first-aid kit(s) for carriage on all aeroplanes, universal precaution kit(s) for carriage on all aeroplanes that require a cabin crew member, and a medical kit for carriage where the aeroplane is authorized to carry more than 100 passengers on a sector length of more than two hours.

1.2 The carriage of AEDs shall be determined by operators on the basis of a risk assessment taking into account the particular needs of the operation. However, many operators carry them because they offer the only effective treatment for cardiac fibrillation. The likelihood of use, and therefore of potential benefit to a passenger, is greatest in aircraft carrying a large number of passengers, over long duration sector lengths.

2 NUMBER OF FIRST-AID AND UNIVERSAL PRECAUTION KITS

2.1 First-aid kits

The number of first-aid kits shall be appropriate to the number of passengers which the aeroplane is authorized to carry:

Passenger	First-Aid Kits
0-100	1
101-200	2
201-300	3
301-400	4
401-500	5
more than 500	6

2.2 Universal precaution kits

For routine operations, one or two universal precaution kits shall be carried on aircraft that are required to operate with at least one cabin crew member. Additional kit(s) should be made available at times of increased public health risk, such as during an outbreak of a serious communicable disease having pandemic potential. Such kits may be used to clean up any potentially infectious body contents such as blood, urine, vomit and faeces and to

protect the cabin crew members who are assisting potentially infectious cases of suspected communicable disease.

3 LOCATION

3.1 First-aid and universal precaution kits shall be distributed as evenly as practicable throughout the passenger cabins. They shall be readily accessible to cabin crew members.

3.2 The medical kit, when carried, shall be stored in an appropriate secure location.

4 CONTENTS

4.1 The following provides guidance on typical contents of first-aid, universal precaution and medical kits.

4.1.1 First-aid kit:

- List of contents
- Antiseptic swabs (10/pack)
- Bandage: adhesive strips
- Bandage: gauze 7.5 cm × 4.5 m
- Bandage: triangular; safety pins
- Dressing: burn 10 cm × 10 cm
- Dressing: compress, sterile 7.5 cm × 12 cm
- Dressing: gauze, sterile 10.4 cm × 10.4 cm
- Tape: adhesive 2.5 cm (roll)
- Steri-strips (or equivalent adhesive strip)
- Hand cleanser or cleansing towelettes
- Pad with shield, or tape, for eye
- Scissors: 10 cm
- Tape: Adhesive, surgical 1.2 cm × 4.6 m
- Tweezers: splinter
- Disposable gloves (multiple pairs)
- Thermometers (non-mercury)
- Mouth-to-mouth resuscitation mask with one-way valve
- First-aid manual, current edition
- Incident record form

The following suggested medications can be included in the first-aid kits:

- Mild to moderate analgesic
- Antiemetic
- Nasal decongestant
- Antacid
- Antihistamine

4.1.2 Universal precaution kit:

- Dry powder that can convert small liquid spill into a sterile granulated gel
- Germicidal disinfectant for surface cleaning
- Skin wipes
- Face/eye mask (separate or combined)
- Gloves (disposable)
- Protective apron
- Large absorbent towel
- Pick-up scoop with scraper
- Bio-hazard disposal waste bag
- Instructions

4.1.3 Medical kit:

Equipment

- List of contents
- Stethoscope
- Sphygmomanometer (electronic preferred)
- Airways, oropharyngeal (three sizes)
- Syringes (appropriate range of sizes)
- Needles (appropriate range of sizes)
- Intravenous catheters (appropriate range of sizes)
- Antiseptic wipes
- Gloves (disposable)
- Needle disposal box
- Urinary catheter
- System for delivering intravenous fluids

- Venous tourniquet
- Sponge gauze
- Tape — adhesive
- Surgical mask
- Emergency tracheal catheter (or large gauge intravenous cannula)
- Umbilical cord clamp
- Thermometers (non-mercury)
- Basic life support cards
- Bag-valve mask
- Flashlight and batteries

Medication

- Epinephrine 1:1 000
- Antihistamine – injectable
- Dextrose 50% (or equivalent) – injectable: 50 ml
- Nitroglycerin tablets, or spray
- Major analgesic
- Sedative anticonvulsant – injectable
- Antiemetic – injectable
- Bronchial dilator – inhaler
- Atropine – injectable
- Adrenocortical steroid – injectable
- Diuretic – injectable
- Medication for postpartum bleeding
- Sodium chloride 0.9% (minimum 250 ml)
- Acetyl salicylic acid (aspirin) for oral use
- Oral beta blocker

If a cardiac monitor is available (with or without an AED) add to the above list:

- Epinephrine 1:10 000 (can be a dilution of epinephrine 1:1 000)

APPENDIX T

OPERATING MINIMA

1 HELIPORT OPERATING MINIMA

1.1 Required RVR/Visibility for operations in performance Class 1

1.1.1 An operator operating in performance Class 1 shall establish an RVR and visibility respectively (RVR/VIS) as take-off minima in accordance with Table 1 below.

Onshore Heliports with IFR Departure Procedure	RVR/Visibility
No lighting and no marking (Day)	250m or the rejected distance, whichever is greater
No marking (Night)	800 m
Runway edge/FATO lighting and centre line marking	200 m
Runway edge/FATO lighting, centre line marking and RVR information	150 m
Offshore Helideck	
Two pilot operations	250 m (1)

Table 1 RVR/Visibility for Take Off

Note 1:- *The pilot-in-command must establish that the take-off path is free of obstacles.*

1.2 2D instrument approach

1.2.1 An operator shall ensure that system minima for 2D instrument approach operation, which are based upon the use of ILS without glide path (LLZ only), VOR, NDB, SRA, and ADF are not lower than the MDH values given in Table 2 below.

Facility	Lowest MDH
ILS (no glide path - LLZ)	250 ft
SRA (terminating at nm)	250 ft
SRA (terminating at 1 nm)	300 ft
SRA (terminating at 2 nm)	350 ft
VOR	300 ft
VOR/DME	250 ft
NDB	300 ft
VDH (QDM & OCH)	300 ft

Table 2 System Minima for 2D Instrument Approach Aide

1.2.2 For 2D instrument approach operation by helicopters performing operations in performance Class 1 or in performance class 2, the minima for RVR given in the following Table shall apply:

Onshore 2D instrument Approach Minima (5)(6)				
MDH (ft)	Facilities/RVR			
	Full (1)	Intermediate (2)	Basic (3)	Nil (4)
250-299 ft	600 m	800 m	1,000 m	1,000 m
300-449 ft	800 m	1,000 m	1,000 m	1,000 m
450 ft and above	1,000 m	1,000 m	1,000 m	1,000 m

Table 3 Onshore 2D Instrument Approach Minima

Note 1:- *Full facilities comprise FATO/runway markings, 720 m or more of Hi/Mi approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights must be on.*

Note 2:- *Intermediate facilities comprise FATO/runway markings, 420 - 719 m of HI/MI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights must be on.*

Note 3:- *Basic facilities comprise FATO/runway markings, <420 m Hi/Mi approach lights, any length of LI approach lights. FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights must be on.*

Note 4:- *Nil approach lights facilities comprise FATO/runway markings. FATO/runway edge lights, threshold lights, FATO/runway end lights or no lights at all.*

Note 5:- *The tables are only applicable to conventional approaches with a nominal descent slope of not greater than 4 degrees. Greater descent slopes will usually require that visual guide slope guidance (e.g. PAPI) is also visible at Minimum Descent Height.*

Note 6:- *The MDH mentioned in Table 3 refers to the initial calculation of MDH. When selecting the associated RVR, there is no need to take account of a rounding up to the nearest ten feet, which may be done for operational purposes e.g. conversion to MDA*

1.3 3D Instrument Approach – Category I operations

1.3.1 For helicopters performing Category I operations in Performance Class 1 or in performance class 2, the following minima for RVR shall apply:

Onshore 3D Instrument Approach Minima (5)(6)(7)				
	Facilities/RVR			
	Full (1)	Intermediate (2)	Basic (3)	Nil (4)
200 ft	500 m	600 m	700 m	1,000 m
201-250 ft	550 m	650 m	750 m	1,000 m
251-300 ft	600 m	700 m	800 m	1,000 m
301 ft & above	750 m	800 m	900 m	1,000 m

Table 4 Onshore 3D Instrument Approach Minima - Category I

Note 1:- *Full facilities comprise FATO/runway markings, 720 m or more of Hi/Mi approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights must be on.*

Note 2:- *Intermediate facilities comprise FATO/runway markings, 420 - 719 m of HI/MI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights must be on.*

Note 3:- *Basic facilities comprise FATO/runway markings, <420 m Hi/Mi approach lights, any length of LI approach lights. FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights must be on.*

Note 4:- *Nil approach lights facilities comprise FATO/runway markings. FATO/runway edge lights, threshold lights, FATO/runway end lights or no lights at all.*

Note 5:- *The Table is applicable to conventional approaches with a glide slope angle up to and including 4 degrees.*

Note 6:- *The DH mentioned in Table 4 refers to the initial calculation of DH. When selecting the associated RVR, there is no need to take account of a rounding up to the nearest ten feet, which may be done for operational purposes e.g. conversion to DA.*

Note 7:- *The DH mentioned in Table 4 refers to the initial calculation of DH. When selecting the associated RVR, there is no need to take account of a rounding up to the nearest ten feet, which may be done for operational purpose (e.g. conversion to DH)*

2 MINIMUM VISIBILITIES FOR VFR OPERATIONS

Altitude Band	Airspace Class	Flight	Distance from cloud
At and above 3,050 m (10,000 ft.) AMSL	A*** B C D E F G	8 km	1,500 m horizontally 300 m (1,000 ft.) vertically
Below 3,050 m (10,000 ft) AMSL and above 900 m (3,000 ft.) AMSL, or above 300 m (1,000 ft.) above terrain, whichever is the higher	A***B C D E F G	5 km	1,500 m horizontally 300 m (1,000 ft.) vertically
At and below 900 m (3,000 ft.) AMSL, or 300 m (1,000 ft.) above terrain, whichever is the higher	A***B C D E	5 km	1,500 m horizontally 300 m (1,000 ft.) vertically
	F G	5 km**	Clear of cloud and with the surface in sight

Table 5 VMC Visibility and Distance from Cloud Minima

* When the height of the transition altitude is lower than 3,050 m (10,000 ft.) AMSL, FL 100 should be used in lieu of 10,000 ft.

** When so prescribed by the appropriate ATS authority:

HELICOPTERS may be operated in Special VFR in flight visibility down to 1,500 m by day, if manoeuvred at a speed that will give adequate opportunity to observe other traffic or any obstacles in time to avoid collision.

*** The VMC minima in Class A airspace are included for guidance to pilots and do not imply acceptance of VFR flights in Class A airspace.

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3 MINIMA FOR FLYING BETWEEN HELIDECKS LOCATED IN CLASS G AIRSPACE

	Day		Night	
	Height (Note1)	**Visibility**	**Height** (Note 1)	**Visibility**
Single Pilot	300 ft.	3 km	500 ft.	5 km
Two Pilots	300 ft.	2 km (Note 2)	500 ft.	5 km

Table 6 Minima for flying between Helidecks located in class G airspace

Note 1:- *The cloud base shall be such as to allow flight at the specified height below and clear of cloud.*

Note 2:- *Helicopters may be operated in flight visibility down to 1,500 m provided the destination or an intermediate structure are continuously visible.*

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APPENDIX U

LIGHTS TO BE DISPLAYED BY AEROPLANES

1 TERMINOLOGY

When the following terms are used in this document, they have the following meanings:

Angles of Coverage

(a) Angle of coverage A is formed by two intersecting vertical planes making angles of 70 degrees to the right and 70 degrees to the left respectively, looking aft along the longitudinal axis to a vertical plane passing through the longitudinal axis.

(b) Angle of coverage F is formed by two intersecting vertical planes making angles of 110 degrees to the right and 110 degrees to the left respectively, looking forward along the longitudinal axis to a vertical plane passing through the longitudinal axis.

(c) Angle of coverage L is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the aeroplane, and the other 110 degrees to the left of the first, when looking forward along the longitudinal axis.

(d) Angle of coverage R is formed by two intersecting vertical planes, one parallel to the longitudinal axis of the aeroplane, and the other 110 degrees to the right of the first, when looking forward along the longitudinal axis.

Horizontal Plane

The plane containing the longitudinal axis and perpendicular to the plane of symmetry of the aeroplane.

Longitudinal Axis of the Aeroplane.

A selected axis parallel to the direction of flight at a normal cruising speed, and passing through the centre of gravity of the aeroplane.

Making Way

An aeroplane on the surface of the water is “making way” when it is under way and has a velocity relative to the water.

Under Command

An aeroplane on the surface of the water is "under command" when it is able to execute maneuvers as required by the International Regulations for Preventing Collisions at Sea for the purpose of avoiding other vessels.

Under Way

An aeroplane on the surface of the water is "under way" when it is not aground or moored to the ground or to any fixed object on the land or in the water.

Vertical Planes

Planes perpendicular to the horizontal plane.

Visible

Visible on a dark night with a clear atmosphere.

2 NAVIGATION LIGHTS TO BE DISPLAYED IN THE AIR

Note:- *The lights specified herein are intended to meet the requirements of Regulation of Civil Aviation Board No. 94 on Rules of the Air for navigation lights.*

As illustrated in Figure 1, the following unobstructed navigation lights shall be displayed:

(a) A red light projected above and below the horizontal plane through angle of coverage L;

(b) A green light projected above and below the horizontal plane through angle of coverage R;

(c) A white light projected above and below the horizontal plane rearward through angle of coverage A.

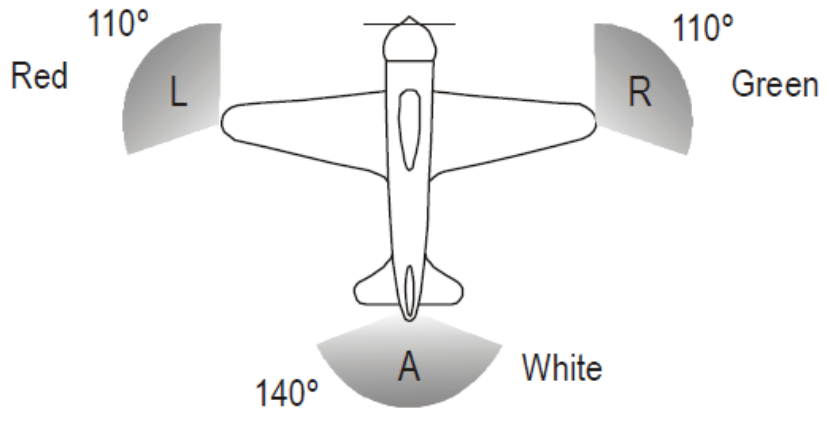


Figure 1

3 LIGHTS TO BE DISPLAYED ON THE WATER

3.1 General

Note:- *The lights specified herein are intended to meet the requirements of Regulation of Civil Aviation Board No. 94 on Rules of the Air for lights to be displayed by aeroplanes on the water.*

The International Regulations for Preventing Collisions at Sea require different lights to be displayed in each of the following circumstances:

(a) When under way;

(b) When towing another vessel or aeroplane;

(c) When being towed;

(d) When not under command and not making way;

(e) When making way but not under command;

(f) When at anchor;

(g) When aground.

The lights required by aeroplanes in each case are described below.

3.2 When under way

As illustrated in Figure 2, the following appearing as steady unobstructed lights:

(a) A red light projected above and below the horizontal through angle of coverage L;

(b) A green light projected above and below the horizontal through angle of coverage R;

(c) A white light projected above and below the horizontal through angle of coverage A; and

(d) A white light projected through angle of coverage F.

The lights described in 3.2 a), b) and c) shall be visible at a distance of at least 3.7 km (2 NM). The light described in 3.2 d) should be visible at a distance of 9.3 km (5 NM) when fitted to an aeroplane of 20 m or more in length or visible at a distance of 5.6 km (3 NM) when fitted to an aeroplane of less than 20 m in length.

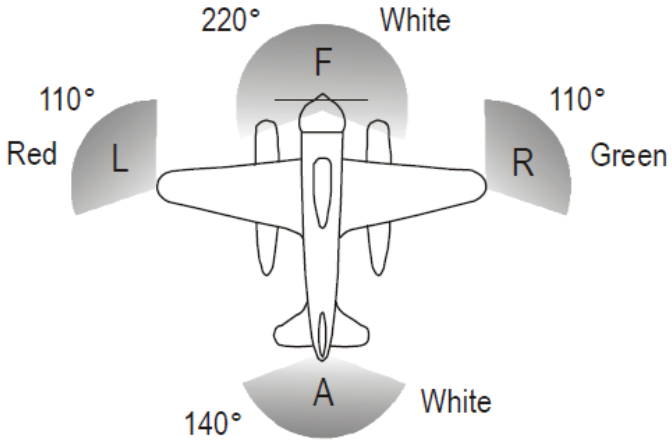


Figure 2

3.3 When towing another vessel or aeroplane

As illustrated in Figure 3, the following appearing as steady, unobstructed lights:

(a) The lights described in 3.2;

(b) A second light having the same characteristics as the light described in 3.2 d) and mounted in a vertical line at least 2 m above or below it; and

(c) A yellow light having otherwise the same characteristics as the light described in 3.2 c) and mounted in a vertical line at least 2 m above it.

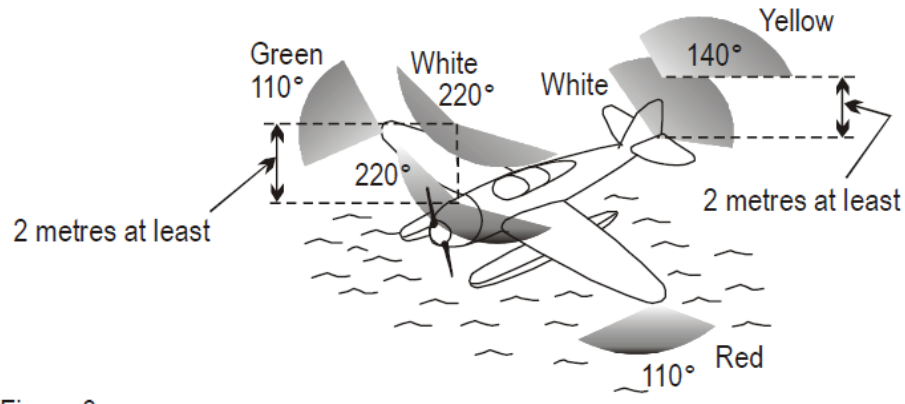


Figure 3

3.4 When being towed

The lights described in 3.2 a), b) and c) appearing as steady, unobstructed lights.

3.5 When not under command and not making way

As illustrated in Figure 4, two steady red lights placed where they can best be seen, one vertically over the other and not less than 1 m apart, and of such a character as to be visible all around the horizon at a distance of at least 3.7 km (2 NM).

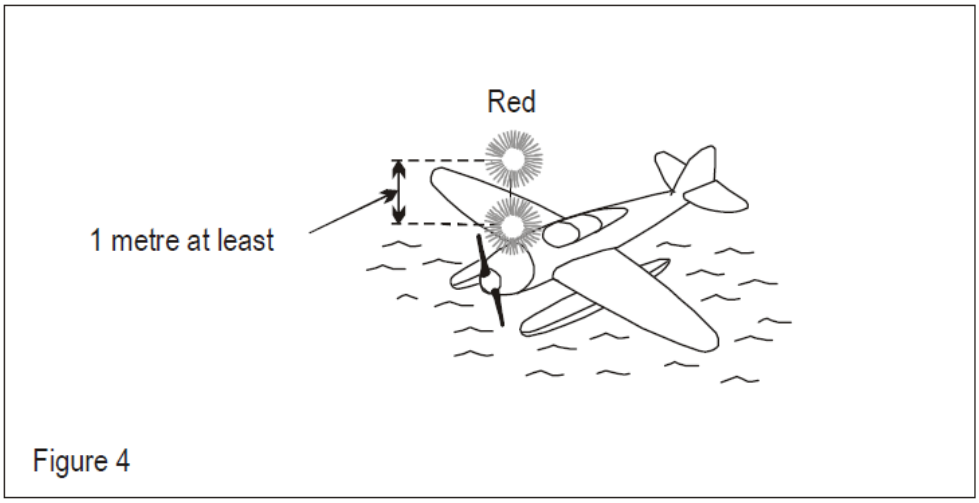


Figure 4

3.6 When making way but not under command

As illustrated in Figure 5, the lights described in 3.5 plus the lights described in 3.2 a), b) and c).

Note:- *The display of lights prescribed in 3.5 and 3.6 is to be taken by other aircraft as signals that the aeroplane showing them is not under command and cannot therefore get out of the way. They are not signals of aeroplanes in distress and requiring assistance.*

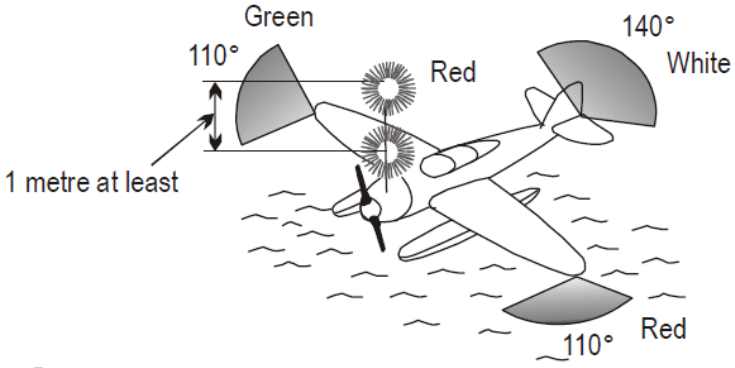


Figure 5

3.7 When at anchor

(a) If less than 50 m in length, where it can best be seen, a steady white light (Figure 6), visible all around the horizon at a distance of at least 3.7 km (2 NM).

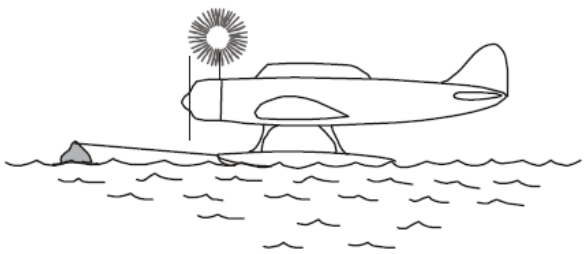
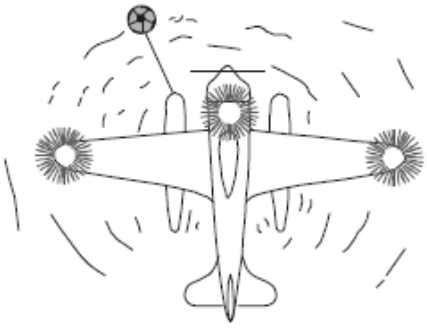


Figure 6

(b) If 50 m or more in length, where they can best be seen, a steady white forward light and a steady white rear light (Figure 7) both visible all around the horizon at a distance of at least 5.6 km (3 NM).

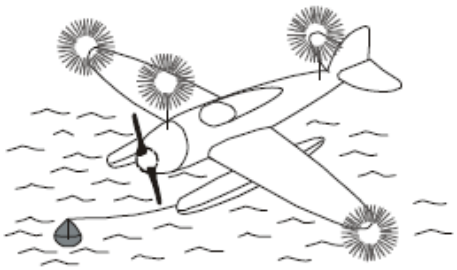
Figure 7

(c) If 50 m or more in span a steady white light on each side (Figures 8 and 9) to indicate the maximum span and visible, so far as practicable, all around the horizon at a distance of at least 1.9 km (1 NM).



Less than 50 metres in length; 50 metres or more in span

Figure 8



50 metres or more in length; 50 metres or more in span

Figure 9

3.8 When aground

The lights prescribed in 3.7 and in addition two steady red lights in vertical line, at least 1 m apart so placed as to be visible all around the horizon.

APPENDIX V

FLIGHT RECORDER

FLIGHT RECORDER

The material in this Appendix concerns flight recorders intended for installation in aeroplanes engaged in international air navigation. Crash-protected flight recorders comprise one or more of the following:

– A flight data recorder (FDR),

– A cockpit voice recorder (CVR),

– An airborne image recorder (AIR),

– A data link recorder (DLR).

When image or data link information is required to be recorded on a crash-protected flight recorder, it is permissible to record it on either the CVR or the FDR.

Lightweight flight recorders comprise one or more of the following:

– an aircraft data recording system (ADRS),

– a cockpit audio recording system (CARS),

– an airborne image recording system (AIRS),

– a data link recording system (DLRS).

When image or data link information is required to be recorded on a lightweight flight recorder, it is permissible to record it on either the CARS or the ADRS.

1 GENERAL REQUIREMENTS

1.1 Non-deployable flight recorder containers shall be painted a distinctive orange colour.

1.2 Non-deployable crash-protected flight recorder containers shall:

(a) Carry reflective material to facilitate their location; and

(b) Have securely attached an automatically activated underwater locating device operating at a frequency of 37.5 khz. At the earliest practicable date, but not later than 1 january 2018, this device shall operate for a minimum of 90 days.

1.3 Automatic deployable flight recorder containers shall:

(a) Be painted a distinctive orange colour, however the surface visible from outside the aircraft may be of another colour;

(b) Carry reflective material to facilitate their location; and

(c) Have an integrated automatically activated ELT.

1.4 The flight recorder systems shall be installed so that:

(a) The probability of damage to the recordings is minimized;

(b) There is an aural or visual means for pre-flight checking that the flight recorder systems are operating properly; and

(c) If the flight recorder systems have an erasure device, the installation shall be designed to prevent operation of the device during flight time or crash impact; and

(d) For aeroplanes for which the individual certificate of airworthiness is first issued on or after 1 january 2023, a flight crew-operated erase function shall be provided on the flight deck which, when activated, modifies the recording of a cvr and air so that it cannot be retrieved using normal replay or copying techniques. The installation shall be designed to prevent activation during flight. In addition, the probability of an inadvertent activation of an erase function during an accident shall also be minimized.

Note:- *The erase function is intended to prevent access to CVR and AIR recordings by normal replay or copying means, but would not prevent accident investigation authorities access to such recordings by specialized replay or copying techniques.*

1.5 The crash-protected flight recorders shall be installed so that they receive electrical power from a bus that provides the maximum reliability for operation of the flight recorders without jeopardizing service to essential or emergency loads.

1.6 The lightweight flight recorders shall be connected to a power source having the characteristics which ensure proper and reliable recording in the operational environment.

1.7 The flight recorder systems, when tested by methods approved by the appropriate certificating authority, shall be demonstrated to be suitable for the environmental extremes over which they are designed to operate.

1.8 Means shall be provided for an accurate time correlation between the flight recorder systems recordings.

1.9 The flight recorder system manufacturer shall provide the appropriate certificating authority with the following information in respect of the flight recorder systems:

(a) manufacturer's operating instructions, equipment limitations and installation procedures;

(b) parameter origin or source and equations which relate counts to units of measurement;

(c) manufacturer's test reports; and

(d) detailed information to ensure the continued serviceability of the flight recorder system.

1.10 The holder of the airworthiness approval for the installation design of the flight recorder system shall make available the relevant continuing airworthiness information to the operator of the aeroplane to be incorporated in the continuing airworthiness maintenance programme. This continuing airworthiness information shall cover in detail all the tasks required to ensure the continued serviceability of the flight recorder system.

Note 1. *The flight recorder system is composed of the flight recorder as well as any dedicated sensors, hardware and software that provide information required per this Appendix.*

2 FLIGHT DATA RECORDER (FDR) AND AIRCRAFT DATA RECORDING SYSTEMS (ADRS)

2.1 Start and stop logic

The FDR or ADRS shall start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power.

2.2 Parameters to be recorded

2.2.1 The parameters that satisfy the requirements for FDRs are listed in Table AD-1. The number of parameters to be recorded shall depend on aeroplane complexity. The parameters without an asterisk (*) are mandatory parameters which shall be recorded regardless of aeroplane complexity. In addition, the parameters designated by an asterisk (*) shall be recorded if an information data source for the parameter is used by aeroplane systems or the flight crew to operate the aeroplane. However, other parameters may be substituted with due regard to the aeroplane type and the characteristics of the recording equipment.

2.2.2 If further FDR recording capacity is available, recording of the following additional information shall be considered:

(a) Operational information from electronic display systems, such as electronic flight instrument systems (EFIS), electronic centralized aircraft monitor (ECAM) and engine indication and crew alerting system (EICAS). Use the following order of priority:

(i) Parameters selected by the flight crew relating to the desired flight path, e.g. Barometric pressure setting, selected altitude, selected airspeed, decision height, and autoflight system engagement and mode indications if not recorded from another source;

(ii) Display system selection/status, e.g. Sector, plan, rose, nav, wxr, composite, copy, etc.;

(iii) Warnings and alerts; and

(iv) The identity of displayed pages for emergency procedures and checklists; and

(b) Retardation information including brake application for use in the investigation of landing overruns and rejected take-offs.

2.2.3 The parameters that satisfy the requirements for flight path and speed as displayed to the pilot(s) are listed below. The parameters without an (*) are mandatory parameters which shall be recorded. In addition, the parameters designated by an (*) shall be recorded if an information source for the parameter is displayed to the pilot and is practicable to record:

- Pressure altitude
- Indicated airspeed or calibrated airspeed
- Heading (primary flight crew reference)
- Pitch attitude
- Roll attitude
- Engine thrust/power
- Landing-gear status*
- Total or outside air temperature*
- Time*
- Navigation data*: drift angle, wind speed, wind direction, latitude/longitude
- Radio altitude*

2.2.4 The parameters that satisfy the requirements for ADRS are the first 7 parameters listed in Table AD-3.

2.2.5 If further ADRS recording capacity is available, the recording of any parameters from 8 onwards defined in Table AD-3 shall be considered.

2.3 Additional information

2.3.1 The measurement range, recording interval and accuracy of parameters on installed equipment shall be verified by methods approved by the appropriate certificating authority.

2.3.2 Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/maintenance information shall be maintained by the operator. The documentation needs to be sufficient to ensure that accident investigation authorities have the necessary information to read out the data in engineering units.

3 COCKPIT VOICE RECORDER (CVR) AND COCKPIT AUDIO RECORDING SYSTEM (CARS)

3.1 Start and stop logic

The CVR or CARS shall start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the CVR or CARS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

3.2 Signals to be recorded

3.2.1 The CVR shall record simultaneously on four separate channels, or more, at least the following:

(a) Voice communication transmitted from or received in the aeroplane by radio;

(b) Aural environment on the flight deck;

(c) Voice communication of flight crew members on the flight deck using the aeroplane's interphone system, if installed;

(d) Voice or audio signals identifying navigation or approach aids introduced in the headset or speaker; and

(e) Voice communication of flight crew members using the passenger address system, if installed.

3.2.2 The preferred CVR audio allocation shall be as follows:

(a) Pilot-in-command audio panel;

(b) Co-pilot audio panel;

(c) Additional flight crew positions and time reference; and

(d) Cockpit area microphone.

3.2.3 The CARS shall record simultaneously on two separate channels, or more, at least the following:

(a) Voice communication transmitted from or received in the aeroplane by radio;

(b) Aural environment on the flight deck; and

(c) Voice communication of flight crew members on the flight deck using the aeroplane's interphone system, if installed.

3.2.4 The preferred CARS audio allocation shall be as follows:

(a) Voice communication; and

(b) Aural environment on the flight deck.

4 AUTOMATIC DEPLOYABLE FLIGHT RECORDER (ADFR)

4.1 Operation

The following requirements shall apply to an ADFR:

- Deployment shall take place when the aeroplane structure has been significantly deformed;
- Deployment shall take place when an aeroplane sinks in water;
- ADFR shall not be capable of manual deployment;
- The ADFR shall be able to float on water;
- The ADFR deployment shall not compromise the safe continuation of the flight;
- The ADFR deployment shall not significantly reduce the chance of survival of the recorder and of successful transmission by its ELT;
- The ADFR deployment shall not release more than one piece;
- An alert shall be made to the flight crew when the ADFR is no longer captive to the aircraft;
- The flight crew shall have no means to disable ADFR deployment when the aircraft is airborne;
- The ADFR shall contain an integrated ELT, which shall activate automatically during the deployment sequence. Such ELT may be of a type that is activated in-flight and provides information from which a position can be determined; and
- The integrated ELT of an ADFR shall satisfy the same requirements as an ELT required to be installed on an aeroplane. The integrated ELT shall at least have the same performance as the fixed ELT to maximize detection of the transmitted signal.

Note 1:-*. Refer to the Manual on Location of Aircraft in Distress and Flight Recorder Data Recovery (ICAO Doc 10054) for more information on ADFR.*

Note 2:- *If an integrated ELT of a type that is activated in flight is used within an ADFR, it could be a means to comply with the requirements by paragraph 18 of Chapter 10.*

5 DATA LINK RECORDER (DLR)

5.1 Applications to be recorded

5.1.1 Where the aircraft flight path is authorized or controlled through the use of data link messages, all data link messages, both uplinks (to the aircraft) and downlinks (from the aircraft), shall be recorded on the aircraft. As far as practicable, the time the messages were displayed to the flight crew and the time of the responses shall be recorded.

Note:- *Sufficient information to derive the content of the data link communications message and the time the messages were displayed to the flight crew is needed to determine an accurate sequence of events on board the aircraft*

5.1.2 Messages applying to the applications listed in Table AD-2 shall be recorded. Applications without the asterisk (*) are mandatory applications which shall be recorded regardless of the system complexity. Applications with an (*) shall be recorded only as far as is practicable given the architecture of the system.

6 FLIGHT CREW-MACHINE INTERFACE RECORDINGS

6.1 Start and stop logic

The AIR or AIRS shall start to record prior to the aeroplane moving under its own power and record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the AIR or AIRS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

6.2 Classes

6.2.1 A Class A AIR or AIRS captures the general cockpit area in order to provide data supplemental to conventional flight recorders.

Note 1:- *To respect crew privacy, the cockpit area view may be designed as far as practical to exclude the head and shoulders of crew members whilst seated in their normal operating position.*

Note 2:- *There are no provisions for Class A AIR or AIRS in this document.*

6.2.2 A Class B AIR or AIRS captures data link message displays.

6.2.3 A Class C AIR or AIRS captures instruments and control panels.

Note:- A Class C AIR or AIRS may be considered as a means for recording flight data where it is not practical or is prohibitively expensive to record on an FDR or an ADRS, or where an FDR is not required.

6.3 Applications to be recorded

6.3.1 The operation of switches and selectors and the information displayed to the flight crew from electronic displays shall be captured by sensors or other electronic means.

6.3.2 The recording of operation of switches and selectors by the flight crew shall include the following:

- Any switch or selector that will affect the operation and the navigation of the aircraft; and
- Selection of normal and alternate systems.

6.3.3 The recording of the information displayed to the flight crew from electronic displays shall include the following:

- Primary flight and navigation displays;
- Aircraft system monitoring displays;
- Engine indication displays;
- Traffic, terrain, and weather displays;
- Crew alerting systems displays;"
- Stand-by instruments; and
- Installed efb to the extent it is practical.

6.3.4 If image sensors are used, the recording of such images shall not capture the head and shoulders of the flight crew members while seated in their normal operating position.

7 INSPECTIONS OF FLIGHT RECORDER SYSTEMS

7.1 Prior to the first flight of the day, the built-in test features for the flight recorders and flight data acquisition unit (FDAU), when installed, shall be monitored by manual and/or automatic checks.

7.2 FDR systems or ADRS, CVR systems or CARS, and AIR systems or AIRS shall have recording inspection intervals of one year. DLR systems or DLRS shall have recording inspection intervals of two years.

7.3 Recording inspections shall be carried out as follows:

(a) An analysis of the recorded data from the flight recorders shall ensure that the recorder operates correctly for the nominal duration of the recording;

(b) The FDR or ADRS recording from a complete flight shall be examined in engineering units to evaluate the validity of all recorded parameters. Particular attention shall be given to parameters from sensors dedicated to the fdr or adrs. Parameters taken from the aircraft's electrical bus system need not be checked if their serviceability can be detected by other aircraft systems;

(c) The readout facility shall have the necessary software to accurately convert the recorded values to engineering units and to determine the status of discrete signals;

(d) An examination of the recorded signal on the cvr or cars shall be carried out by replay of the cvr or cars recording. While installed in the aircraft, the cvr or cars shall record test signals from each aircraft source and from relevant external sources to ensure that all required signals meet intelligibility standards;

(e) Where practicable, during the examination, a sample of in-flight recordings of the cvr or cars shall be examined for evidence that the intelligibility of the signal is acceptable; and

(f) An examination of the recorded images on the air or airs shall be carried out by replay of the air or airs recording. While installed in the aircraft, the air or airs shall record test images from each aircraft source and from relevant external sources to ensure that all required images meet recording quality standards.

(g) An examination of the recorded messages on the dlr or dlrs shall be carried out by replay of the dlr or dlrs recording.

7.4 A flight recorder system shall be considered unserviceable if there is a significant period of poor-quality data, unintelligible signals, or if one or more of the mandatory parameters is not recorded correctly.

7.5 A report of the recording inspection shall be made available on request to regulatory authorities for monitoring purposes.

7.6 Calibration of the FDR system:

(a) For those parameters which have sensors dedicated only to the FDR and are not checked by other means, recalibration shall be carried out at an interval determined by the continuing airworthiness information for the FDR system. In the absence of such information, a recalibration shall be carried out at least every five years. The recalibration shall determine any discrepancies in the engineering conversion routines for the mandatory parameters and to ensure that parameters are being recorded within the calibration tolerances; and

(b) When the parameters of altitude and airspeed are provided by sensors that are dedicated to the FDR system, there shall be a recalibration performed at an interval determined by the continuing airworthiness information for the FDR system. In the absence of such information, a recalibration shall be carried out at least every two years.

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Table AD-1. Parameter Characteristics for Flight Data Recorders

Serial Number	Parameter	Applicability	Measurement Range	Maximum Sampling and Recording Interval (Seconds)	Accuracy Limits (Sensor Input Compared to FDR Readout)	Recording Resolution
1	Time (UTC when available, otherwise relative time count or GNSS time sync)		24 hours	4	±0.125%/h	1 s
2	Pressure-altitude		–300 m (–1 000 ft) to maximum certificated altitude of aircraft +1 500 m (+5 000 ft)	1	±30 m to ±200 m (±100 ft to ±700 ft)	1.5 m (5 ft)
3	Indicated airspeed or calibrated airspeed		95 km/h (50 kt) to max VSo (Note 1) VSo to 1.2 VD (Note 2)	1	±5% for note 1 ±3% for note 2	1 kt (0.5 kt recommended)
4	Heading (primary flight crew reference)		360°	1	±2°	0.5°
5	Normal acceleration (Note 8)	Application for type certification is submitted to a Contracting State before 1 January 2016	–3 g to +6 g	0.125	±1% of maximum range excluding datum error of ±5%	0.004 g

Serial Number	Parameter	Applicability	Measurement Range	Maximum Sampling and Recording Interval (Seconds)	Accuracy Limits (Sensor Input Compared to FDR Readout)	Recording Resolution
		Application for type certification is submitted to a Contracting State on or after 1 January 2016	–3 g to +6 g	0.0625	±1% of maximum range excluding datum error of ±5%	0.004 g
6	Pitch attitude		±75° or usable range Whichever is greater	0.25	±2°	0.5°
7	Roll attitude		±180°	0.25	±2°	0.5°
8	Radio transmission keying		On-off (one discrete)	1		
9	Power on each engine (Note 3)		Full range	1 (per engine)	±2%	0.2% of full range or the resolution required to operate the aircraft
10	Trailing edge flap and cockpit control selection		Full range or each discrete position	2	±5% or as pilot's indicator	0.5% of full range or the resolution required to operate the aircraft

Serial Number	Parameter	Applicability	Measurement Range	Maximum Sampling and Recording Interval (Seconds)	Accuracy Limits (Sensor Input Compared to FDR Readout)	Recording Resolution
11	Leading edge flap and cockpit control selection		Full range or each discrete position	2	±5% or as pilot's indicator	0.5% of full range or the resolution required to operate the aircraft
12	Thrust reverser position		Stowed, in transit, and reverse	1 (per engine)		
13	Ground spoiler/speed brake selection (selection and position)		Full range or each discrete position	1	±2% unless higher accuracy uniquely required	0.2% of full range
14	Outside air temperature		Sensor range	2	±2°C	0.3°C
15	Autopilot/ auto throttle/ AFCS mode and engagement status		A suitable combination of discrete	1		

Serial Number	Parameter	Applicability	Measurement Range	Maximum Sampling and Recording Interval (Seconds)	Accuracy Limits (Sensor Input Compared to FDR Readout)	Recording Resolution
16	Longitudinal acceleration (Note 8)	Application for type certification submitted to a Contracting State before 1 January 2016	±1 g	0.25	±0.015 g excluding a datum error of ±0.05 g	0.004 g
		Application for type certification submitted to a Contracting State on or after 1 January 2016	±1 g	0.0625	±0.015 g excluding a datum error of ±0.05 g	0.004 g

Serial Number	Parameter	Applicability	Measurement Range	Maximum Sampling and Recording Interval (Seconds)	Accuracy Limits (Sensor Input Compared to FDR Readout)	Recording Resolution
17	Lateral acceleration (Note 8)	Application for type certification submitted to a Contracting State before 1 January 2016	±1 g	0.25	±0.015 g excluding a datum error of ±0.05 g	0.004 g
		Application for type certification submitted to a Contracting State on or after 1 January 2016	±1 g	0.0625	±0.015 g excluding a datum error of ±0.05 g	0.004 g

Serial Number	Parameter	Applicability	Measurement Range	Maximum Sampling and Recording Interval (Seconds)	Accuracy Limits (Sensor Input Compared to FDR Readout)	Recording Resolution
18	Pilot input and/or control surface position primary controls (pitch, roll, yaw) (Notes 4 and 8)	Application for type certification submitted to a Contracting State before 1 January 2016	Full range	0.25	±2° unless higher accuracy uniquely required	0.2% of full range or as installed
		Application for type certification submitted to a Contracting State on or after 1 January 2016	Full range	0.125	±2° unless higher accuracy uniquely required	0.2% of full range or as installed
19	Pitch trim position		Full range	1	±3% unless higher accuracy uniquely required	0.3% of full range or as installed
20	Radio altitude		–6 m to 750 m (–20 ft to 2 500 ft)	1	±0.6 m (±2 ft) or ±3% whichever is greater below 150 m (500 ft) and ±5% above 150 m (500 ft)	0.3 m (1 ft) below 150 m (500 ft) 0.3 m (1 ft) + 0.5% of full range above 150 m (500 ft)

Serial Number	Parameter	Applicability	Measurement Range	Maximum Sampling and Recording Interval (Seconds)	Accuracy Limits (Sensor Input Compared to FDR Readout)	Recording Resolution
21	Vertical beam deviation (ILS/GNSS/GLS glide path, MLS elevation, IRNAV/IAN vertical deviation)		Signal range	1	±3%	0.3% of full range
22	Horizontal beam deviation (ILS/GNSS/GLS localizer, MLS azimuth, IRNAV/IAN lateral deviation)		Signal range	1	±3%	0.3% of full range
23	Marker beacon passage		Discrete	1		
24	Master warning		Discrete	1		
25	Each NAV receiver frequency selection (Note 5)		Full range	4	As installed	

Serial Number	Parameter	Applicability	Measurement Range	Maximum Sampling and Recording Interval (Seconds)	Accuracy Limits (Sensor Input Compared to FDR Readout)	Recording Resolution
26	DME 1 and 2 distance (includes Distance to runway threshold (GLS) and Distance to missed approach point (IRNAV/IAN)) (Notes 5 and 6)		0 – 370 km (0 – 200 NM)	4	As installed	1 852 m (1 NM)
27	Air/ground status		Discrete	1		
28	GPWS/TAWS/GCA S status (selection of terrain display mode including pop-up display status) and (terrain alerts, both cautions and warnings, and advisories) and (on/off switch position)		Discrete	1		
29	Angle of attack		Full range	0.5	As installed	0.3 % of full range

Serial Number	Parameter	Applicability	Measurement Range	Maximum Sampling and Recording Interval (Seconds)	Accuracy Limits (Sensor Input Compared to FDR Readout)	Recording Resolution
30	Hydraulics, each system (low pressure)		Discrete	2		0.5% of full range
31	Navigation data (latitude/longitude, ground speed and drift angle) (Note 7)		As installed	1	As installed	
32	Landing gear and gear selector position		Discrete	4	As installed	
33	Groundspeed		As installed	1	Data should be obtained from the most accurate system	1 kt
34	Brakes (left and right brake pressure, left and right brake pedal position)		(Maximum metered brake range, discretes or full range)	1	±5%	2% of full range

Serial Number	Parameter	Applicability	Measurement Range	Maximum Sampling and Recording Interval (Seconds)	Accuracy Limits (Sensor Input Compared to FDR Readout)	Recording Resolution
35	Additional engine parameters (EPR, N1, indicated vibration level, N2, EGT, fuel flow, fuel cut-off lever position, N3, engine fuel metering valve position)	Engine fuel metering valve position: Application for type certification is submitted to a Contracting State on or after 1 January 2023	As installed	Each engine each second	As installed	2% of full range
36	TCAS/ACAS (traffic alert and collision avoidance system)			Discrete	1	As installed
37	Wind shear warning			Discrete	1	As installed
38	Selected barometric setting (pilot, copilot)		As installed	64	As installed	0.1 mb (0.01 in-Hg)
39	Selected altitude (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
40	Selected speed (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection

Serial Number	Parameter	Applicability	Measurement Range	Maximum Sampling and Recording Interval (Seconds)	Accuracy Limits (Sensor Input Compared to FDR Readout)	Recording Resolution
41	Selected Mach (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
42	Selected vertical speed (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
43	Selected heading (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
44	Selected flight path (all pilot selectable modes of operation) (course/DSTRK, path angle, final approach path (IRNAV/IAN))			1	As installed	
45	Selected decision height		As installed	64	As installed	Sufficient to determine crew selection
46	EFIS display format (pilot, co-pilot)		Discrete(s)	4	As installed	
47	Multifunction/engine/alerts display format		Discrete(s)	4	As installed	

Serial Number	Parameter	Applicability	Measurement Range	Maximum Sampling and Recording Interval (Seconds)	Accuracy Limits (Sensor Input Compared to FDR Readout)	Recording Resolution
48	AC electrical bus status		Discrete(s)	4	As installed	
49	DC electrical bus status		Discrete(s)	4	As installed	
50	Engine bleed valve position		Discrete(s)	4	As installed	
51	APU bleed valve position		Discrete(s)	4	As installed	
52	Computer failure		Discrete(s)	4	As installed	
53	Engine thrust command		As installed	2	As installed	
54	Engine thrust target		As installed	4	As installed	2% of full range
55	Computed centre of gravity		As installed	64	As installed	1% of full range
56	Fuel quantity in CG trim tank		As installed	64	As installed	1% of full range
57	Head up display in use		As installed	4	As installed	
58	Para visual display on/off		As installed	1	As installed	
59	Operational stall protection, stick shaker and pusher activation		As installed	1	As installed	
60	Primary navigation system reference (GNSS, INS, VOR/DME, MLS, Loran C, localizer glideslope)		As installed	4	As installed	

Serial Number	Parameter	Applicability	Measurement Range	Maximum Sampling and Recording Interval (Seconds)	Accuracy Limits (Sensor Input Compared to FDR Readout)	Recording Resolution
61	Ice detection		As installed	4	As installed	
62	Engine warning each engine vibration		As installed	1	As installed	
63	Engine warning each engine over temperature		As installed	1	As installed	
64	Engine warning each engine oil pressure low		As installed	1	As installed	
65	Engine warning each engine over speed		As installed	1	As installed	
66	Yaw trim surface position		Full range	2	±3% unless higher accuracy uniquely required	0.3% of full range
67	Roll trim surface position		Full range	2	±3% unless higher accuracy uniquely required	0.3% of full range
68	Yaw or sideslip angle		Full range	1	±5%	0.5°
69	De-icing and/or antiicing systems selection		Discrete(s)	4		
70	Hydraulic pressure (each system)		Full range	2	±5%	100 psi
71	Loss of cabin pressure		Discrete	1		
72	Cockpit trim control input position, Pitch		Full range	1	±5%	0.2% of full range or as installed

Serial Number	Parameter	Applicability	Measurement Range	Maximum Sampling and Recording Interval (Seconds)	Accuracy Limits (Sensor Input Compared to FDR Readout)	Recording Resolution
73	Cockpit trim control input position, Roll		Full range	1	±5%	0.2% of full range or as installed
74	Cockpit trim control input position, Yaw		Full range	1	±5%	0.2% of full range or as installed
75	All cockpit flight control input forces (control wheel, control column, rudder pedal)		Full range (±311 N (±70 lbf), ± 378 N (±85 lbf), ± 734 N (±165 lbf))	1	±5%	0.2% of full range or as installed
76	Event marker		Discrete	1		
77	Date		365 days	64		
78	ANP or EPE or EPU		As installed	4	As installed	
79	Cabin pressure altitude	Application for type certification submitted to a Contracting State on or after 1 January 2023	As installed (0 ft to 40 000 ft recommended)	1	As installed	100 ft
80	Aeroplane computed weight	Application for type certification submitted to a Contracting State on or after 1 January 2023	As installed	64	As installed	1% of ful range

Serial Number	Parameter	Applicability	Measurement Range	Maximum Sampling and Recording Interval (Seconds)	Accuracy Limits (Sensor Input Compared to FDR Readout)	Recording Resolution
81	Flight director command	Application for type certification submitted to a Contracting State on or after 1 January 2023	Full range	1	± 2°	0.5°
82	Vertical speed	Application for type certification submitted to a Contracting State on or after 1 January 2023	As installed	0.25	As installed (32 ft/min recommended)	16 ft/min

Table 1 AD-1. Parameter Characteristics for Flight Data Recorders

Notes:-

(1) VSo stalling speed or minimum steady flight speed in the landing configuration is in Section "Abbreviations and Symbols".

(2) VD design diving speed.

(3) Record sufficient inputs to determine power.

(4) For aeroplanes with control systems in which movement of a control surface will back drive the pilot's control, ''or'' applies. For aeroplanes with control systems in which movement of a control surface will not back drive the pilot's control, ''and'' applies. In aeroplanes with split surfaces, a suitable combination of inputs is acceptable in lieu of recording each surface separately. In aeroplanes with independent pilot input on primary controls, each pilot input on primary controls needs to be recorded separately.

(5) If signal available in digital form.

(6) Recording of latitude and longitude from INS or other navigation system is a preferred alternative.

(7) If signals readily available.

(8) It is not intended that aeroplanes issued with an individual certificate of airworthiness before 1 January 2016 be modified to meet the measurement range, maximum sampling and recording interval, accuracy limits or recording resolution description detailed in this Appendix.

Table AD-2. Description of Applications for Data Link Recorders

Item No.	Application Type	Application Description	Recording Content
1	Data link initiation	This includes any applications used to log on to or initiate data link service. In FANS-1/A and ATN, these are ATS facilities notification (AFN) and context management (CM) respectively.	C
2	Controller/pilot communication	This includes any application used to exchange requests, clearances, instructions and reports between the flight crew and controllers on the ground. In FANS-1/A and ATN, this includes the CPDLC application. It also includes applications used for the exchange of oceanic (OCL) and departure clearances (DCL) as well as data link delivery of taxi clearances.	C
3	Addressed surveillance	This includes any surveillance application in which the ground sets up contracts for delivery of surveillance data. In FANS-1/A and ATN, this includes the automatic dependent surveillance — contract (ADS-C) application. Where parametric data are reported within the message they shall be recorded unless data from the same source are recorded on the FDR.	C
4	Flight information	This includes any service used for delivery of flight information to specific aircraft. This includes, for example, data link aviation weather report service (D-METAR), data link-automatic terminal service (D-ATIS), digital Notice to Airmen (D-NOTAM) and other textual data link services.	C
5	Aircraft broadcast surveillance	This includes elementary and enhanced surveillance systems, as well as automatic dependent surveillance — broadcast (ADS-B) output data. Where parametric data sent by the aeroplane are reported within the message they shall be recorded unless data from the same source are recorded on the FDR.	M*
6	Aeronautical operational control data	This includes any application transmitting or receiving data used for aeronautical operational control purposes (per the ICAO definition of operational control).	M*

Table 2 AD-2. Description of Applications for Data Link Recorders

Key: C: Complete contents recorded.

M: Information that enables correlation to any associated records stored separately from the aeroplane.

*: Applications to be recorded only as far as is practicable given the architecture of the system.

Table AD-3. Parameter Characteristics for Aircraft Data Recording Systems

No.	Parameter Name	Minimum Recording Range	Maximum Recording Interval in Seconds	Minimum Recording Accuracy	Minimum Recording Resolution	Remarks
1	Heading					Heading is preferred, if not available, yaw rate shall be recorded
	a) Heading (Magnetic or True)	±180º	1	±2°	0.5°	
	b) Yaw rate	±300º/s	0.25	±1% + drift of 360°/h	2°/s	
2	Pitch					Pitch attitude is preferred, if not available, pitch rate shall be recorded
	a) Pitch attitude	±90º	0.25	±2°	0.5°	
	b) Pitch rate	±300º/s	0.25	±1% + drift of 360°/h	2°/s	
3	Roll					Roll attitude is preferred, if not available, roll rate shall be recorded
	a) Roll attitude	±180º	0.25	±2°	0.5°	

No.	Parameter Name	Minimum Recording Range	Maximum Recording Interval in Seconds	Minimum Recording Accuracy	Minimum Recording Resolution	Remarks
	b) Roll rate	±300º/s	0.25	±1% + drift of 360°/h	2°/s	
4.	Positioning system:					
	a) Time	24 hours	1	±0.5 s	0.1 s	UTC time preferred where available.
	b) Latitude/longitude	Latitude: ±90° Longitude: ±180°	2 (1 if available)	As installed (0.00015° recommended)	0.00005°	
	c) Altitude	–300 m (–1 000 ft) to maximum certificated altitude of aeroplane +1 500 m (5 000 ft)	2 (1 if available)	As installed (±15 m (±50 ft) recommended)	1.5 m (5 ft)	
	d) Ground speed	0–1 000 kt	2 (1 if available)	As installed (±5 kt recommended)	1 kt	
	e) Track	0–360º	2 (1 if available)	As installed (± 2º recommended)	0.5°	
	f) Estimated error	Available range	2 (1 if available)	As installed	As installed	Shall be recorded if readily available

No.	Parameter Name	Minimum Recording Range	Maximum Recording Interval in Seconds	Minimum Recording Accuracy	Minimum Recording Resolution	Remarks
5	Normal acceleration	–3 g to + 6 g (*)	0.25 (0.125 if available)	As installed (± 0.09 g excluding a datum error of ±0.45 g recommended)	0.004 g	
6	Longitudinal acceleration	±1 g (*)	0.25 (0.125 if available)	As installed (±0.015 g excluding a datum error of ±0.05 g recommended)	0.004 g	
7	Lateral acceleration	±1 g (*)	0.25 (0.125 if available)	As installed (±0.015 g excluding a datum error of ±0.05 g recommended)	0.004 g	
8	External static pressure (or pressure altitude)	34.4 mb (3.44 in-Hg) to 310.2 mb (31.02 in-Hg) or available sensor range	1	As installed (±1 mb (0.1 in-Hg) or ±30 m (±100 ft) to ±210 m (±700 ft) recommended)	0.1 mb (0.01 in-Hg) or 1.5 m (5 ft)	
9	Outside air temperature (or total air temperature)	–50° to +90°C or available sensor range	2	As installed (±2°C recommended)	1°C	

No.	Parameter Name	Minimum Recording Range	Maximum Recording Interval in Seconds	Minimum Recording Accuracy	Minimum Recording Resolution	Remarks
10	Indicated air speed	As the installed pilot display measuring system or available sensor range	1	As installed (±3 % recommended)	1 kt (0.5 kt recommended)	
11	Engine RPM	Full range including overspeed condition	Each engine each second	As installed	0.2% of full range	
12	Engine oil pressure	Full range	Each engine each second	As installed (5% of full range recommended)	2% of full range	
13	Engine oil temperature	Full range	Each engine each second	As installed (5% of full range recommended)	2% of full range	
14	Fuel flow or pressure	Full range	Each engine each second	As installed	2% of full range	

No.	Parameter Name	Minimum Recording Range	Maximum Recording Interval in Seconds	Minimum Recording Accuracy	Minimum Recording Resolution	Remarks
15	Manifold pressure	Full range	Each engine each second	As installed	2% of full range	
16	Engine thrust/power/torque parameters required to determine propulsive thrust/power*	Full range	Each engine each second	As installed	0.1% of full range	* Sufficient parameters e.g. EPR/N1 or torque/Np as appropriate to the particular engine shall be recorded to determine power in both normal and reverse thrust. A margin for possible overspeed should be provided.
17	Engine gas generator speed (Ng)	0-150%	Each engine each second	As installed	0.2% of full range	
18	Free power turbine speed (Nf)	0-150%	Each engine each second	As installed	0.2% of full range	
19	Coolant temperature	Full range	1	As installed (±5°C recommended)	1° C	
20	Main voltage	Full range	Each engine each second	As installed	1 Volt	
21	Cylinder head temperature	Full range	Each engine each second	As installed	2% of full range	

No.	Parameter Name	Minimum Recording Range	Maximum Recording Interval in Seconds	Minimum Recording Accuracy	Minimum Recording Resolution	Remarks
22	Flaps position	Full range or each discrete position	2	As installed	0.5°	
23	Primary flight control surface position	Full range	0.25	As installed	0.2% of full range	
24	Fuel quantity	Full range	4	As installed	1% of full range	
25	Exhaust gas temperature	Full range	Each engine each second	As installed	2% of full range	
26	Emergency voltage	Full range	Each engine each second	As installed	1 Volt	
27	Trim surface position	Full range or each discrete position	1	As installed	0.3% of full range	
28	Landing gear position	Each discrete position*	Each gear every two seconds	As required		* Where available, record up-and- locked and down and-locked position
29	Novel/unique aircraft features	As required	As required	As required	As required	

Table 3 AD-3. Parameter Characteristics for Aircraft Data Recording Systems

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APPENDIX W

SCOPE OF LINE MAINTENANCE DEFECT RECTIFICATION

(a) Replacement of wheel assemblies.

(b) Replacement of wheel brake units.

(c) Replacement of emergency equipment.

(d) Replacement of ovens, boilers and beverage makers.

(e) Replacement of internal and external lights, filaments and flash tubes.

(f) Replacement of windscreen wiper blades.

(g) Replacement of passenger and cabin crew seats, seat belts and harnesses.

(h) Closing of cowlings and refitment of quick access inspection panels.

(i) Replacement of toilet system components but excluding gate valves.

(j) Simple repairs and replacement of internal compartment doors and placards but excluding doors forming part of a pressure structure.

(k) Simple repairs and replacement of overhead storage compartment doors and cabin furnishing items.

(l) Replacement of static wicks.

(m) Replacement of aircraft batteries (main and APU).

(n) Replacement of in-flight entertainment system components other than public address.

(o) Routine lubrication and replenishment of all system fluids and gases.

(p) The de-activation only of sub-systems and aircraft components as permitted by the operator's minimum equipment list where such de-activation is agreed by the competent authority as a simple task.

(q) Inspection for and removal of de-icing/anti-icing fluid residues, including removal/closure of panels, cowls or covers or the use of special tools.

(r) Any other task agreed by the CAAT as a simple task for a particular aircraft type. This may include defect deferment when all the following conditions are met:

(i) There is no need for troubleshooting; and

(ii) The task is in the MEL; and

(iii) The maintenance action required by the MEL is agreed by the competent authority to be simple.

In the particular case of helicopters, and in addition to the items above, the following:

(s) Removal and installation of Helicopter Emergency Medical Service (HEMS) simple internal medical equipment.

(t) Removal and installation of external cargo provisions (i.e., external hook, mirrors) other than the hoist.

(u) Removal and installation of quick release external cameras and search lights.

(v) Removal and installation of emergency float bags, not including the bottles.

(w) Removal and installation of external doors fitted with quick release attachments.

(x) Removal and installation of snow pads/skid wear shoes/slump protection pads.

APPENDIX X

GUIDE TO CURRENT FLIGHT RECORDER PROVISIONS

For the carriage of flight recorders, new and revised requirements were introduced concerning flight recorders. These amendments include an update of the provisions pertaining to flight recorders, recording of digital communications, FDR requirements for new aircraft, revised parameter listings; two-hour duration CVRs. Through the years, the applicability date and the carriage of flight recorders to be installed, as defined by the SARPs, were complex.

The tables below summarize the current flight recorders carriage requirements.

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Table AH-1. FDR/AIR/ADRS/AIRS Installation Requirements

<table>
<tr><th rowspan="3">Date</th><th colspan="9">MCTOM</th></tr>
<tr><th colspan="3">Over 27000 kg</th><th colspan="3">Over 5700 kg</th><th colspan="3">5700 kg and below</th></tr>
<tr><th>All aeroplanes new type certificate</th><th>All aeroplanes first certificate of airworthiness</th><th>All turbine aeroplanes first certificate of airworthiness</th><th>All aeroplanes new type certificate</th><th>All aeroplanes first certificate of airworthiness</th><th>All turbine aeroplanes first certificate of airworthiness</th><th>All aeroplanes new type certificate</th><th>All aeroplanes first certificate of airworthiness</th><th>All turbine aeroplanes first certificate of airworthiness</th></tr>
<tr><td></td><td rowspan="5">-</td><td rowspan="2">-</td><td>3.1.1.4</td><td rowspan="5">-</td><td rowspan="2">-</td><td>3.1.1.4</td><td rowspan="4">-</td><td rowspan="5">-</td><td rowspan="5">-</td></tr>
<tr><td>1987 ≥</td><td>3.1.1.5</td><td rowspan="4">-</td></tr>
<tr><td>1989 ≥</td><td rowspan="3">3.1.1.2</td><td rowspan="3">3.1.1.3</td></tr>
<tr><td>1990 ≥</td></tr>
<tr><td>2005 ≥</td><td rowspan="3">3.1.1.6</td><td rowspan="3">3.1.1.6</td></tr>
<tr><td>2016 ≥</td><td>Table AD-1 of Appendix V (Some parameters are sampled at an increased frequency)</td><td>Table AD-1 of Appendix V (Some parameters are sampled at an increased frequency)</td><td>3.1.1.1</td></tr>
<tr><td>2023 ≥</td><td>3.1.1.7</td><td>-</td><td>3.1.1.7</td><td>-</td><td>-</td></tr>
</table>

Note:- *Number as shown in above table refer to Chapter 10*

Table AH-2. CVR/CARS Installation Requirements

<table>
<tr><th rowspan="3">Date</th><th colspan="6">MCTOM</th></tr>
<tr><th colspan="2">Over 27000 kg</th><th colspan="2">Over 5700 kg</th><th colspan="2">Over 2250 kg</th></tr>
<tr><th>All aeroplanes</th><th>All turbine aeroplanes first certificate of airworthiness</th><th>All aeroplanes first certificate of airworthiness</th><th>All turbine aeroplanes first certificate of airworthiness</th><th>All turbine aeroplanes more than 1 pilot new type certificate</th><th>All turbine aeroplanes more than 1 pilot first certificate of airworthiness</th></tr>
<tr><td>1987 ≥</td><td rowspan="2">-</td><td rowspan="4">3.2.1.3</td><td rowspan="4">3.2.1.2</td><td rowspan="4">-</td><td>-</td><td rowspan="4">-</td></tr>
<tr><td>2003 ≥</td></tr>
<tr><td>2016 ≥</td><td rowspan="2">3.2.3.1</td><td rowspan="3">3.2.1.1</td></tr>
<tr><td>2022 ≥</td><td>3.2.3.2</td></tr>
</table>

Note:- *Number as shown in above table refer to Chapter 10*

Table AH-3. Combination Recorder Installation Requirements

DATE	MCTOM			
	Over 15000 kg	**Over 5700 kg**		**Less than 5700 kg**
	All aeroplanes new type certificate requiring CVR and FDR	All aeroplanes new type certificate requiring CVR and FDR	All aeroplanes requiring CVR and FDR	All multi-engined turbine-powered aeroplanes requiring FDR and/or CVR
2016 ≥	3.5.4.1	-		-

Note:- *Number as shown in above table refer to Chapter 10*

Table AH-4. Flight Crew-Machine Interface Recording Requirements

DATE	MCTOM	
	Over 27000 kg	**Over 5700 kg**
	All aeroplanes new type certificate	**All aeroplanes first certificate of airworthiness**
2023 ≥	3.4.1.1	-

Note:- *Number as shown in above table refer to Chapter 10*

Table AH-5. Data Link Communications (DLC) Recording Installation Clarification

Rows	Date individual certificate of airworthiness was first issued	Date aircraft type certificate issued or modification for DLC equipment first approved	Date of activation for use of DLC equipment	DLC recording required	Reference
1	On or after 1 January 2016	On or after 1 January 2016	On or after 1 January 2016	Yes	3.3.1.1
2	On or after 1 January 2016	Before 1 January 2016	On or after 1 January 2016	Yes	3.3.1.1
3	Before 1 January 2016	On or after 1 January 2016	On or after 1 January 2016	Yes	3.3.1.2
4	Before 1 January 2016	Before 1 January 2016	Before 1 January 2016	No	3.3.1.2
5	Before 1 January 2016	Before 1 January 2016	On or after 1 January 2016	No	3.3.1.2

Note:- *Number as shown in above table refer to Chapter 10*

1 TABLE HEADINGS

1.1 Date individual certificate of airworthiness was first issued is self-explanatory.

1.2 Date aircraft type certificate issued or modification for DLC equipment first approved is the date that allows the installation of DLC equipment on the aircraft and refers to the airworthiness approval of the installation of aircraft components such as the structural and wiring provisions with which the DLC equipment needs to be compliant. These airworthiness approvals are usually in a form of a type certificate, a supplemental type certificate or an amended type certificate.

1.2.1 It is not uncommon for original customers of an aircraft that have airworthiness approvals related to DLC capability, to choose not to install the DLC equipment or choose not to have it activated even if the aircraft is prepared for it.

1.3 Date of activation for use of DLC equipment refers to the date that a DLC application referred to in 5.1.2 of Appendix V was first activated for use.

1.3.1 Datalink communication (DLC) equipment as used in these provisions, refer to the physical unit(s) (e.g. box(es)) that was approved to a minimum performance standard issued by a certification authority (e.g. TSO or ETSO).

1.3.2 The activation of DLC functions refer to approved software activation of DLC functions or software updates.

DLC recording required refers to the requirement to record DLC message in accordance with provisions chapter 10, 3.3.1.1 and 3.3.1.2.

2 GENERALS

2.1 It is the date on which the CVR capabilities of the aircraft were approved that determines the DLC recording requirement. The date in which the DLC equipment was approved to a minimum performance standard is not relevant for CVR recording requirement purposes.

2.2 For the DLC equipment to be compliant with an airworthiness approval, it needs to be able to use, without modification, the installed aircraft components that are necessary to provide the DLC function such as the:

(a) Datalink router (e.g. Hosted in the communications management unit);

(b) Radios (e.g. Vhf, hf datalink, satcom) and related antennas.

2.3 Approved software updates to installed equipment or software activation of functions normally do not alter the DLC equipment compliance with the rest of the aircraft systems.

3 EXAMPLES

3.1 For rows 1 and 2:

– The recording requirement is driven by 3.3.1.1 of Chapter 10 which is based on when the individual certificate of airworthiness was first issued. Any subsequent airworthiness modifications related to DLC capability do not exempt the aircraft from the requirement to record DLC messages.

3.2 For rows 3 to 5 - General:

– The recording requirement is driven by Standard 3.3.1.2 of Chapter 10 and is based on whether or not the aircraft has an airworthiness approval for DLC capabilities and the date of its issue.

– Since there was no requirement to record DLC messages prior to 1 January 2016, airworthiness approvals related to DLC capability issued before that date did not necessarily include this function.

3.3 For row 3:

– The recording requirement applies regardless of when the certificate of airworthiness was issued, because an airworthiness approval related to DLC capability was issued on or after 1 January 2016. The date of installation of the equipment would typically be after the airworthiness approval.

3.4 For row 4:

– The recording requirement does not apply because the aircraft's certificate of airworthiness and an airworthiness approval related to DLC capability was issued before 1 January 2016. The date of installation of DLC equipment is not a factor for DLC message recording requirements as long as the equipment is compliant with that airworthiness approval.

3.5 For row 5:

– The recording requirement does not apply because the aircraft's certificate of airworthiness and an airworthiness approval related to DLC capability was issued before 1 January 2016. The date of installation of DLC equipment is not a factor for DLC message recording requirements as long as the equipment is compliant with that airworthiness approval.

APPENDIX Y

INDIRECT APPROVAL OF AIRWORTHINESS MANUAL

1 GENERAL

Applicable airworthiness manuals such as General Maintenance Manual (GMM), Aircraft Maintenance Programme (AMP), Minimum Equipment List (MEL), Extended Diversion Time Operations (EDTO) manual, Training Program Manual (TPM) for technical and maintenance personnel, and Reliability Programme Manual (RPM) shall be approved by the CAAT unless any amendments fall within the scope of an approved indirect approval procedure.

The indirect approval procedure for applicable airworthiness manuals shall be established in the GMM.

2 INDIRECT APPROVAL PRINCIPLE

2.1 The CAAT is ultimately responsible for the oversight of manual indirect approval.

2.2 Upon receiving of indirect approval notification, the CAAT may partly stop or reject the indirect approval version of a manual if the following conditions reveals:

(a) The established indirect approval procedure for applicable airworthiness manuals in the GMM is not in compliance with this Appendix

(b) The submitted amended contents do not comply with established class of amendments

(c) The submitted amended contents are incomplete, or incorrect

2.3 Upon receiving feedback from the CAAT for any deficiencies relating to the notified indirect approval, the air operators shall stop utilising the indirectly approved version of the manual until correction is taken to a satisfactory standard.

2.4 Failure to comply with the approved established indirect approval procedure will be grounds for review and could result in the withdrawal of the operator's privilege to utilize indirect approval of manuals on either a temporary or permanent basis.

3 CLASS OF AMENDMENTS ELIGIBLE FOR INDIRECT APPROVAL

Depending upon the nature of airworthiness manuals, the scope of indirect approval of each manual shall be the following, but not limit to:

3.1 GMM or equivalent, eligible amendments **SHALL NOT** be:

(a) Name of the organisation

(b) Main location of the organisation

(c) Additional locations of the organisation

(d) Accountable manager and any of the nominated personnel (under AOCR Chapter 1 Item 7.2 and Chapter 9 Item 4)

(e) Reduction or increase of the staff number when the variation:

- Is more than 25% of the total staff number declared in manpower section (e.g. reduction of 26 staff when the staff to maintain the approval was 100)
- Is affecting the approval (e.g. all qualified staff for a certain aircraft type leave the organisation)

(f) Addition/removal of any organisation(s) working under the operator's quality system

(g) Facilities, equipment, tools, materials, procedures, work scope or staff that could affect the approval certificate

(h) Any change affecting the approval certificate

3.2 AMP or equivalent, eligible amendments shall be:

(a) Tasks that are provided by Type Certificate holder or Supplemental Type Certificate holder

(b) Repetitive maintenance tasks derived from Airworthiness Directives or Mandatory Continuing Airworthiness Information (MCAI) from State of Design

(c) Tasks derived from Structural Repair

(d) Additions, amendments and deletions of additional tasks such as additional scheduled maintenance tasks selected by the operator on a voluntary basis (e.g. operator policy for interiors), or manufacturer recommendations outside ICA (e.g. Service Letter) linked to product improvements or maintenance practices.

(e) Source document references in the maintenance program where the relevant source documents are amended without having an effect on the maintenance program content

(f) Editorial issues, typos, etc., (without having an effect on the AMP content)

3.3 MEL or equivalent, eligible amendments shall be:

(a) MEL item amended in accordance with State of Design's Master MEL (MMEL)

(b) Source document references in the MEL where the relevant source documents are amended without having an effect on the MEL content

(c) Editorial issues, typos, etc., (without having an effect on the MEL content)

3.4 Other airworthiness manuals such as manuals of the EDTO, TPM, RPM, etc., eligible amendments shall be:

(a) Revision of distribution list (without having an effect on currently existing concerned parties)

(b) Changes of any responsible unit's names (without having an effect on duties and responsibilities)

(c) Source document references in the manual where the relevant source documents are amended without having an effect on the manual content

(d) Editorial issues, typos, etc., (without having an effect on the manual content)

4 PROCEDURE DESCRIPTION

The procedure for indirect approval of a manual shall be consist of the following information:

(a) Specification of the class of amendments eligible for indirect approval

(b) How to amend and control the amendment of the manual which shall be distinguished from normal amendment (direct approval)

(c) The responsible personnel for control and amendment of the manual

(d) For the MEL, coordination between flight operations and airworthiness to review and approve operational-related and airworthiness-related elements of the MEL

(e) A clear interval for incorporation of all indirect approval versions of a manual to be submitted to the CAAT for approval

(f) Notification of minor amendments of a manual to the CAAT at least 10 calendar days before its effective date

(g) Notification documents to be submitted to the CAAT which shall include, but not limit to:

  (i) The completed minor amendment of the manual (the latest approved version of manual inserted with all effective page up until the current indirect approval version). Submission of only amended pages is not acceptable.

  (ii) Support information for such amendments e.g. master data or source documents

  (iii) Acceptable documents (e.g. technical information from manufacturer, conversational email, etc.)

  (iv) For the AMP, AO – Maintenance Programme Amendment Approval Submission form in accordance with the Announcement of CAAT on Aircraft Maintenance Program of Air Operator Certificate Holder B.E. 2560 shall be submitted

(h) A description on how to manage and stop utilising the published indirect approval version of manual when there is any fault revealed in the manual or intervention feedback from the CAAT

APPENDIX Z

RECTIFICATION INTERVAL EXTENSION (RIE) OF THE MEL

1 RIE PRINCIPLE

1.1 Under certain conditions, such as a shortage of parts from manufacturers, or other unforeseen, situations, air operators may be unable to comply with specified rectification intervals. This may result in the grounding of aircraft. To preclude that from happening, a process has been instituted that will allow operators, subject to the approval of the CAAT, to grant extensions to MEL rectification interval categories.

1.2 The core of this RIE process is to ensure that operators do not substitute RIEs as a means to reduce or eliminate the need to rectify MEL defects in accordance with the established category limit. Operators are not to use the extension process as a normal means of conducting MEL item rectification. RIEs will only be considered valid and justifiable when events beyond the operator's control have precluded rectification. The operator should ensure that rectifications are accomplished at the earliest opportunity.

1.3 It is recognized that while MEL item rectification interval categories have been established, it may not be possible in every case to rectify aircraft in the time allotted for each MEL item. Several factors may influence the operator's ability to comply with the specified interval.

These factors include:

(a) Parts shortages from manufacturers that affect all operators equally. Parts shortages can result from material, labour, or shipping problems but shall be clearly outside the operator's control.

(b) Inability to obtain equipment necessary for proper troubleshooting and repair. Operators should, to the maximum extent possible, have the necessary equipment available to perform troubleshooting and rectification of MEL items. Equipment shortages or unserviceability may be encountered that cannot be directly controlled by the operator for the specified MEL item.

1.4 Unwillingness on the part of the operator to obtain parts or equipment to rectify the defect in the timeliest manner possible or failure to comply with an approved established RIE procedure will be grounds for review and could result in the withdrawal of the operator's privilege to utilise RIEs on either a temporary or permanent basis.

1.5 The operators shall approach the CAAT for an approval of the RIE of the applicable Rectification Intervals B, C, and D, for the same duration as specified in the approved MEL. Conditions and limitations shall be based on the State of Design prescribed MMEL.

1.6 For the third extension of an MEL item and so on, support documents from design organisation in safety assessment relevant to the applicable MEL reference is required to be submitted for approval.

2 ONE-TIME EXTENSION PRINCIPLE

In addition to the principle prescribed in Section 1 of this appendix, the following principle shall be followed:

2.1 The operator may be authorised to approve a single, self-extension (one-time extension) provided that an appropriate RIE procedure is established in GMM and approved by the CAAT.

2.2 Personnel authorising RIEs shall be adequately trained in technical and/or operational disciplines to accomplish their duties. They shall have necessary operational knowledge in terms of operational use of the MEL as alleviating documents by flight crew and maintenance personnel and engineering competence.

2.3 The operator is required to report all such uses, together with the appropriate justification, to the CAAT. The CAAT is ultimately responsible for the oversight of RIEs.

2.4 The operators shall approach the CAAT for an approval of the second and further extension.

3 RIE PROCEDURE DESCRIPTION

The procedure for extension of MEL repair interval shall be defined by the operator in their GMM and shall consist of:

3.1 A description of the RIE principle

3.2 A description of personnel with specific duties and responsibilities for CAAT approval request preparation and controlling extensions.

3.3 A description of documents to be submitted to CAAT for approval request or notification which shall consist of:

(a) Original Technical log when the defect is raised and MEL status list

(b) Evidence or supporting documents relevant to the extension

(i) For one-time extension, the authorised evidence (letter, form, or email)

(ii) Supporting documents relevant to the reason of the extension

(iii) Extracted page of the relevant MEL reference from the current approved MEL

(iv) When the MEL is rectified, Technical log and support documents

(c) Safety assessment from design organisation (required for the 3rd extension and so on)

3.4 A description to ensure that a copy of the authorising or approval document will accompany the technical log entry as long as the extension is effective.

3.5 A description of notification to CAAT by the operator as soon as possible after rectification is taken by using report form and channel acceptable to the CAAT.

3.6 A description to retain a copy of the completed extension and relevant documents for a period of 36 months, for auditing purposes.

3.7 In addition, for one-time self-extension, the following descriptions shall be included:

(a) Details of the position of the nominated personnel responsible for the authorising the extension acceptable to the CAAT.

(b) Consultation procedure between the flight operational and technical staff of the operator as to the requirement for the RIE and the recommendation.

(c) Conditions and limitations which shall be based on the State of Design prescribed MMEL.

(d) A description of how to assess, authorise, control, monitor, and document the extension.

(e) A description of notification to CAAT by the operator as soon as possible after the one-time extension being authorised but no later than 10 days by using report form and channel acceptable to the CAAT.

4 EXTENSION ASSESSMENT

The assessment for RIE authorisation / approval shall take into account the following:

4.1 The condition and limitations of the MEL item that requires RIE, and the details of the original defect are in accordance with the approved MEL and MMEL, including:

(a) The rectification interval category of the requested MEL item

(b) The requested extending rectification duration is the same duration of the interval category

4.2 The cause of the defect is known

4.3 The reason for MEL rectification interval extension is essential and justified to be clearly outside the operator's control

4.4 The reasons why rectification was not carried out within the original rectification interval is not related to a lack of manpower

4.5 Effect on any special operations (e.g. RVSM, AWO, PBN, EDTO, etc.)

4.6 Effect on workload or efficiency of flight crews

4.7 Effect on any emergency procedure

4.8 The exposure to additional failures during continued operation with inoperative items (multiple inoperative items)

4.9 The extension will not have an adverse effect on the safety of the aircraft operation and aircraft capability in an emergency

APPENDIX AA

PERMITTED VARIATION TO MAINTENANCE PERIODS

1 VARIATION PRINCIPLE

1.1 A permitted variation to a period required by the Aircraft Maintenance Programme (AMP) may be granted by the CAAT on a case by case basis on occasions where the operator does not have the ability to perform the required maintenance within the prescribed limits.

1.2 A permitted variation applies to a unique aircraft, for a unique occasion.

1.3 Where the TC/STC holder has **not** prescribed any variation that may be applied to maintenance periods, the operator may vary the periods prescribed by the AMP provided that such variations are within the limits prescribed in CAAT announcement subject Aircraft Maintenance Programme of AOC Holder.

1.4 Where the TC/STC holder has prescribed variations that may be applied using operator procedures to maintenance intervals in the AMP, the operator shall use those variation or as prescribed in CAAT announcement subject Aircraft Maintenance Programme of AOC Holder, whichever is more restrictive.

1.5 Where the TC/STC holder has prescribed tolerances (or margins, short-term escalations, etc.) that may be applied to maintenance intervals in the AMP specifically for maintenance scheduling purpose (flexible programme), the operator may use those tolerances, as long as it is satisfactorily controlled and managed, but shall not combine their use with variation prescribed in CAAT announcement subject Aircraft Maintenance Programme of AOC Holder.

1.6 Variations shall be permitted only when the periods prescribed by the AMP (or documents in support of this programme) cannot be complied with due to circumstances, **which could not reasonably have been foreseen by the operator**.

Examples of such circumstances:

- The aircraft not being able to arrive at the maintenance location due to weather conditions
- Unscheduled grounding of an aircraft other than main base
- Maintenance provider suddenly goes out of business
- Unplanned unavailability of a hanger due to the delayed release of another aircraft
- Unforeseen workload peak in the maintenance organisation
- Unforeseen unavailability of staff
- Unforeseen delay in the parts provisioning
- Unforeseen unavailability or unserviceability of a required tool or equipment
- Unforeseen change of aircraft due to significant ground damage event on another aircraft in the fleet

1.7 Permitted variations do not apply to:

(a) Those components for which an ultimate (scrap) or retirement life has been prescribed (e.g. primary structure of components with limited fatigue lives and high energy rotating parts or which containment is not provided). Details concerning all items of this nature are included in the Type Certificate Holder's documents or manuals

(b) Tasks related to Mandatory Continuing Airworthiness Information (MCAI) such as Airworthiness directives (ADs)

(c) Maintenance Programme tasks which have been classified as mandatory by the Type Certificate Holder / Supplemental Type Certificate holder, State of Design, or the Authority

(d) Certification Maintenance Requirements (CMR) unless specifically approved by the manufacturer and agreed by the State of Design

(e) Airworthiness limitation Items (ALIs)

(f) Critical Design Configuration Control Limitations (CDCCL Items)

(g) EDTO / ETOPS related tasks

(h) Safety Directives

(i) Tasks derived from MRB/MPD based on MSG-3 analysis and with a Failure Effect Category (FEC) of 5 - 'Evident Safety Effect' and 8 – 'Hidden Safety Effect'

Note: In the AMP, limitations may also be specified per task group or task type. For example: "C-check to be performed at 1000 flt hrs +/-100 flt hrs", it means that "a one-time variation of 10% may be applied to all lubrication task intervals", but "**no extension may be applied to any life limit or tasks in the criteria prescribed in section 1.7 of this Appendix**".

1.8 In case variation outside the scope of this Appendix is required, an application for approval can be sent to the CAAT, together with substantiating documents from the design holder. In addition, coordination with State of Design's Authority is required for task modifications related to MCAI, ALIs, CMRs, or other documents mandated by State of Design's Authority.

1.9 The application of variations will not result in the task being performed less often. Unless specified by design organisation's Maintenance Programme Document (MPD) or Master Service Manual (MSM) or equivalent document, or agreed by the CAAT, after a variation has been applied, the next due date for the maintenance tasks shall be calculated using the previous due date (as opposed to accomplishment date). The period to the next required inspection shall be deemed to begin at the point prior to when the task/interval was extended. No extension may be taken towards the next required inspection.

When an aircraft is grounded, variation of the maintenance tasks controlled by calendar time other than parking or storage maintenance tasks may be accepted to be overdue. After performance of the maintenance task before flight, the next due may then be calculated from this last performance of the maintenance task.

1.10 The variation is an exceptional means to allow the operator to fly for a limited period of time until the required maintenance can be performed. This implies that best efforts must be applied to limit the number and duration of variations.

1.11 The variation should not be understood to be a maintenance planning tool. Failure to comply with conditions prescribed in this appendix will be grounds for review and could result in the withdrawal of the operator's privilege to utilize variation on either a temporary or permanent basis.

1.12 A variation shall not be applied if there is evidence or reason to believe that it could endanger flight safety.

1.13 Air Navigation ACT, CAAT Airworthiness Directive and CAAT Requirements may override these conditions.

2 ONE-TIME VARIATION PRINCIPLE

In addition to the principle prescribed in Section 1 of this Appendix, the following principle shall be followed:

2.1 One-time variation shall not be used for maintenance tasks that have already been overdue.

2.2 The operator may be authorised to approve a single, self-variation (one-time variation) provided that an appropriate variation procedure is established in GMM and approved by the CAAT.

2.3 Personnel authorising variation shall be adequately trained in technical disciplines relating to particular aircraft type to accomplish their duties. They shall have necessary engineering and maintenance knowledge in terms of continuing airworthiness concept and maintenance planning activities.

2.4 The operator is required to report all one-time variation uses, together with the appropriate justification, to the CAAT. The CAAT is ultimately responsible for the oversight of variations.

2.5 The operators shall approach the CAAT for an approval of the further variation.

3 VARIATION PROCEDURE DESCRIPTION

The procedure for variation to maintenance periods shall be defined by the operator in their GMM and shall consist of:

3.1 A description of permitted variation principle.

3.2 A description of personnel with specific duties and responsibilities for CAAT approval request preparation and controlling variations.

3.3 A description of documents to be submitted to CAAT for approval request or notification which shall consist of:

(a) Aircraft identification, by registration marks

(b) Justification of the need for such a variation

(c) The list of maintenance tasks to be applied with variation

(d) Reference of maintenance tasks to be applied with variation from master data (e.g. MPD)

(e) Variation Procedure from (as applicable):

- Manufacturer's latest revision MPD
- Operator's latest revision procedural manual (GMM and/or AMP)

(f) Proposed variation in the appropriate figure (flight hours, cycles, etc.)

(g) Current inspection status of the aircraft

(h) List of any aircraft deferred defects which are affected by the variation

(i) Consultation procedure for support information from design organisation.

(j) Confirmation that the variation does not affect any mandatory maintenance tasks, life limitation, ADs etc.

(k) Compensation tasks (i.e. additional maintenance tasks undertaken to be performed before the new proposed limit).

(l) For one-time variation, the authorised evidence for the variation (letter, form, or email)

(m) Supporting documents relevant to the reason of the variation

(n) For a second variation, supporting documents from design organisation is required

3.4 A description to ensure that a copy of the authorising or approval document will accompany the technical log entry as long as the variation is effective.

3.5 A description of notification to CAAT by the operator as soon as possible after maintenance tasks that applied with variation are accomplished by using report form and channel acceptable to the CAAT.

3.6 A description to retain a copy of the completed variation and relevant documents for a minimum period of 90 days after the aircraft has been permanently withdrawn from service.

3.7 In addition, for one-time variation, the following descriptions shall be included:

(a) Details of the position of the nominated personnel responsible for the authorising the variation acceptable to the CAAT

(b) A description of how to assess, authorise, control, monitor, and document the variation.

(c) A description of notification to CAAT by the operator as soon as possible prior to, or no later than, the first day of the use of the one-time variation by using report form and channel acceptable to the CAAT

(d) The notification package shall include, as applicable but not be limited to:

(i) The authorised evidence for using a one-time variation (letter, form, or email depending upon the operator procedure)

(ii) The list of tasks to be extended

(iii) Proposed plan for maintenance inputs to complete the variating maintenance tasks

(iv) Flight schedule or expecting aircraft utilisation during variation periods (if there are maintenance tasks with FH or FC intervals)

(v) Support information from operator profile, fleet experiences, reliability data or organisational quality control system, etc (if any)

(vi) Acceptable documents (e.g. technical information from the manufacturer, conversational email, etc.)

(e) In relation to the principles prescribed in this Appendix, the CAAT may review the number of variations granted to the operator over a year. If the number of variations appears to be too high, it may decide to withdraw the privilege to utilize variation or vary the conditions of authorisation

4 VARIATION ASSESSMENT

4.1 According to the nature of the information submitted in accordance with paragraph 3.3 above the CAAT may decide:

(a) To refuse or suspend the variation

(b) To approve or accept the variation, with or without additional conditions (such additional conditions may include a request to exclude a certain number of postponed defects from the variation)

(c) To approve or accept the variation, but with a different limit or condition

4.2 In relation to the principles prescribed in this Appendix, the number of variations already granted by the CAAT or the authorized person during the past 12 months may have a bearing on the decision made by the CAAT.

APPENDIX AB

HUMAN FACTOR PRINCIPLE IN DOCUMENT DESIGN AND APPLICATION

Note:- *This is a recommended practice.*

1 DOCUMENT DESIGN AND APPLICATION

Written communication is at the very heart of aviation work. Therefore, ensuring that documents are both usable and are actually used are keys to a successful error reduction.

Poorly written or presented procedures has been a contributing factor for many incidents. While it is important that the original or manufacturers' data are incorporated accurately within the procedures, this information can be presented well or poorly, depending upon the skill of the procedure writer and the extent to which the procedure is revised based on experience and practice.

The following guidelines are intended to assist in the development and amendment of manuals and procedures:

1.1 Ensure procedure design and changes involve personnel who have a good working knowledge of the tasks

1.2 Validate all procedures and changes to those procedures before use, where practicable;

1.3 Ensure procedures are accurate, appropriate and usable, and that they reflect best practice;

1.4 Take into account the level of expertise and experience of the user; where appropriate, provide an abbreviated version of the procedure for use by experienced users;

1.5 Take into account the environment in which the procedures are to be used;

1.6 Ensure that all key information is included without the procedure being unnecessarily complex;

1.7 Where appropriate, explain the reason for the procedure;

1.8 Ensure that the order of tasks and steps reflect best practice, with the procedure clearly stating where the order of steps is critical and where the order is optional;

1.9 If the order of steps is not already dictated, consider ordering the steps according to logic or space (e.g. working around the aircraft sequentially, as with a pilot's checklist), as opposed to alphabetical or ATA chapter order;

1.10 Group steps into "chunks" and plan for interruptions. Train staff to complete a "chunk" of steps before allowing themselves to be interrupted, and design the procedure in such a way that it can be marked when and where an interruption occurs;

1.11 Ensure consistency in the design of procedures and use of terminology, abbreviations, references, etc.;

1.12 Where possible, try to ensure that a complete procedure or chunk of information is on one page. Where a procedure runs to more than one page, make this clear;

1.13 Include clear titles at the top of each page and section of the procedure. Where the procedure has been changed, highlight this change where appropriate (with a line or the letter "R" at the side of the page), and note the revision date at the bottom of the page;

1.14 Ensure that any cross-referencing is easy to access;

1.15 Logical flow should be clear, using a flow chart if necessary. If procedures include options and branches, care should be taken that the path through the procedure is clear, especially if the user is required to return to an earlier point in the procedure after having actioned a set of steps. This can be particularly important in troubleshooting;

1.16 Group associated steps on the page; separate non-associated steps on the page. Use blank lines or spaces appropriately;

1.17 Use emphasis (e.g. italics and bold) consistently. Avoid overuse of upper case for emphasis; lower case is easier to read. Avoid overuse of italics, reserving this for single words or short phrases only, or for notes. Boxing is useful to distinguish very important steps or chunks from less important steps or chunks;

1.18 A diagram or photograph can be very useful and can communicate large amounts of information efficiently. However, care must be taken with their use, ensuring:

- It is correct (a diagram of a similar piece of equipment which is not exactly the same can cause more confusion than help);
- It photocopies well (if photocopying is likely to take place);
- The fine detail can be read in the lighting conditions under which it will be used;
- It is orientated and labelled appropriately; and
- The diagram/photograph is clearly linked with a procedure/step;

1.19 Insert warnings and notes into the procedure wherever necessary, without unduly detracting from clarity, to ensure safe and accurate performance;

1.20 Consider the use of warnings, cautions or notes to highlight important points and steps where errors are likely (information from the internal error management scheme should identify error-prone procedures and steps);

1.21 Distinguish between directive information, reference information, warnings, cautions, notes, procedures and methods;

1.22 Use cautions and warnings directly above the text to which they refer or, where this is inappropriate, clearly link the text and the warning or note. Use notes after the related text;

1.23 Cautions, warnings and notes must be on the same page as the text to which they refer;

1.24 Where practical, build in check boxes into the procedure to enable and encourage the user to check off steps as they are completed;

1.25 Clearly link the check box with the associated step, e.g. using dotted lines;

1.26 Allow enough space if information needs to be entered;

1.27 Stress the importance of clear handwriting if written information needs to be handed over to another person;

1.28 Ensure that printing/copy quality is good, and that there are enough printers, copiers, etc.; and

1.29 Provide training on the use of technology to access and print procedures and related data.

2 INFORMATION READABILITY

2.1 Typographic layout

2.1.1 Page size

(a) Use a standard paper size (A4).

2.1.2 Page layout

(a) Use a single column layout as this is easier for lower-level readers and does not affect more experienced readers.

(b) For 8-1/2 x 11 inch paper, use a left margin of 1.5 inches and allow at least 1.0 inch for all other margins. The ideal line length is 10 to 12 words, or about 6 to 7 inches.

(c) Label each page with a subject heading at the top.

(d) Number each page sequentially placing the numbers at the lower right corner, 0.5 inches above the bottom edge of the page and not extending into the right margin.

(e) There is no need to end every page at the same point, i.e. the baseline can vary from page to page.

2.1.3 Justification

(a) Use left justification, i.e. typing lines up at left edge only. Centre and right justification is distracting and can slow reading speed.

2.1.4 Paragraphs and indentation

(a) Use modified block style with two space indentation for subdivisions.

(b) Label each heading and sub-heading sequentially, i.e. 1., 1.1, 1.1.1, etc.

(c) Within a heading, keep paragraphs below half a page in length, to help the reader's concentration.

(d) Leave one blank line between paragraphs.

(e) Do not indent the start of each paragraph.

(f) Use 1:2 space ratio between sentence spacing and paragraph spacing.

(g) Use one blank line to separate all paragraphs and headings.

(h) Use one space after commas, colons and semicolons.

(i) Use two spaces after periods, question marks and exclamation marks.

2.1.5 Typeface (font)

(a) Use the typefaces (fonts) which have a relatively large height, are moderately expanded, solid rather than delicate looking, and have fairly uniform type colour, for example, Times Roman, Century Series, New Gothic, or Helvetica. Times Roman is the most common font style and the least fatiguing to proof-readers due to its easy readability.

(b) Keep the font consistent throughout the document and between documents.

2.1.6 Type size (font size)

(a) Use sizes between 9 and 12 points for ease of reading. The best size for most uses is 11 or 12 points.

2.1.7 Emphasis

(a) Keep a consistent use of emphasis throughout the document and between documents.

(b) To emphasize a single word, use bold (most preferred), underlining, italics or all capitals (least preferred).

(c) To emphasize a lengthy passage, use bold or underlining. Avoid CAPITALS or italics as they slow reading and reduce comprehension.

(d) Use only one or two emphasis techniques within a document to increase comprehension. Bold and underlining are good choices.

(e) Do not overuse emphasis techniques as it causes confusion and reduces comprehension.

2.1.8 Responses

(a) If a check box following the related instruction will be used, do not use a large gap between the check box and the instruction.

(b) Avoid the use of a sign box with “Not Required” or “XXXXX” if the user of the document is not responsible for the instruction accomplishment.

(c) Use a consistent check box design throughout the document if it is possible.

(d) Give enough space if expecting any answer from the user.

2.1.9 Colour

(a) Avoid regular use of colour in illustrations. Use distinctive shading patterns within black line images instead of colour.

(b) Coloured paper does not photocopy well.

(c) Black ink on white paper is recommended.

2.2 Pagination

2.2.1 Avoid use of any reference back to previous text.

2.2.2 Avoid references to other sections of the document as far as possible. Unavoidable cross references must be precise and unmistakable.

2.2.3 The page should act as a naturally occurring information module, i.e. it should contain an appropriate number of tasks and avoid carryover of task across pages.

2.2.4 Each task that begins on a page should also end on that page.

2.2.5 Minimize the routing; in other words, do not route the user from page to page since it can cause serious defects.

2.3 Letters, numbers and words

2.3.1 Letters and numbers

(a) Use lower case letters instead of upper case in the text since lower case letters are much easier to read because they have more distinguishable shapes (ascenders and descenders). Note that upper case letters occupy more space (40 to 45 per cent more than lower case letters) and reduce the reading speed by 13 to 20 per cent.

(b) Use mixed-case headings and sub-headings instead of all capitals to improve readability.

(c) Avoid hyphens which merely indicate word division at the end of a line.

(d) In series of words or statements which present mutually exclusive choices, making the "or" explicit throughout the series enhances comprehension.

(e) Use Arabic numbers followed by a period for each item in a list if it should use numbers. If not, use a bullet or dash to get the attention of the user.

(f) Do not enclose the number in parentheses.

(g) Use a consistent or conventional (ATA style) dash-number breakdown such as chapter-section-subject-page (e.g. 26-09-01-02).

2.3.2 Words

(a) Avoid using different terms for the same object.

(b) Use precise, unambiguous and common words, with which the user of the document is familiar, throughout the document for consistency. (AECMA Simplified English is a suitable guide.)

(c) Do not use many prepositions; they cause the user to read slowly.

2.3.3 Abbreviations

(a) Use only known acronyms and proper nouns.

(b) Avoid abbreviations. If abbreviations have to be used, then:

- Use them consistently; and
- Use the first few letters to remind the reader of the word.

(c) Provide a glossary if the users need one.

2.4 Writing well

2.4.1 General considerations on writing

(a) Try to achieve a balance between brevity, elaboration and redundancy of information.

(b) Complement verbal material by appropriate pictorial representation.

(c) Adapt the format of instruction to the characteristics of the respective task.

(d) Write clear, simple, precise and self-explanatory instructions.

(e) Minimize the writing requirement for the users of the documents.

(f) Summarize the main ideas of lengthy prose passages in a section before the text since it aids in learning the context.

(g) Use adequate information in the instruction steps.

(h) Text should be written in a consistent and standardized syntax.

(i) Text should be as brief and concise as practicable.

(j) Use a logical structure of sentences and paragraphs since they are easier to understand and remember. Logically place:

- General before specific provisions;
- Important before lesser provisions;
- Frequent provisions first; and
- Permanent before temporary provisions.

2.4.2 Sentences

(a) Use simplified language (e.g. AECMA Simplified English) as much as possible.

(b) Use short sentences instead of long ones since short sentences are easier to read and understand.

(c) Use definite and affirmative sentences in the active tense instead of using negative forms and passive tenses since the active voice increases comprehension.

(d) Use sentences with personal pronouns since they increase comprehension and the reader's motivation.

(e) Sentences with many subordinate clauses are difficult to comprehend.

(f) Use action verbs because they are easier to read and understand.

(g) Do not use sentences with a long noun string, since they are hard to understand.

(h) Use sentences complete with the necessary "who" and "which" words to clarify the relative clauses. This should avoid ambiguity and ease reading.

(i) Ideas expressed in positive terms are easier to understand.

(j) State directly what has to be said without excess or unnecessary words since the sentences with unnecessary words are harder to understand and take longer to read.

2.4.3 Lists and tables

(a) Data and information presented in the tables facilitate understanding and comparison.

(b) In lists and tables, do not leave blanks within a line greater than half an inch or five spaces.

(c) Group the lines in lists and tables according to content.

(d) Do not group more than five lines together.

(e) Separate the groups in the list and table by spacing.

(f) Write the list of items in parallel construction since that way is easier to read and remember.

(g) List a series of items, conditions, etc. rather than displaying them in a series separated by commas.

(h) Avoid using compound questions and statements.

(i) Minimize the logically related question as much as possible.

(j) Construct the questions in a way which requires minimum memory use from the user of the document.

2.4.4 Graphic information

(a) Place the visual item in the text of a document near the discussion to which it relates. If it is not possible, place the visual item in an appendix, label the item and refer to it.

(b) Use a clear title with a figure or a table number on the line directly below all illustrations.

(c) Use the same title for illustrations as corresponding text subject title.

(d) Use either a horizontal-landscape format with the top of the illustration at the binding edge or vertical layout to present graphic information for ease of reading and cross-reference consistently.

(e) Adequate text must be supplied to support illustrations, not vice versa.

(f) Draw illustrations in a size and line weight such that they can be used without any rework for the production of material for screen projection in a training environment.

(g) Illustrations should have limited information in order to avoid a cluttered appearance. The presentation should be self-explanatory.

(h) Use illustrations as the primary source of information transfer.

(i) Present all spatial information in graphical format instead of in textual format.

(j) Label each table and figure with an Arabic numeral, such as Table 1 and Figure 1.

(k) Use simple line drawings, which are superior in most cases.

(l) Use a consistent format for figure layout and numbering.

(m) Use illustrations whenever they will simplify, shorten or make the text easier to understand.

(n) Do not use complicated reference numbers for figures, e.g. T07-40423-001.

(o) Avoid use of perspective part drawings as figures.

(p) The figure views should be as the user sees it.

(q) Use standard and correct technical drawing terminology, e.g. avoid use of terms “section” and “view” interchangeably.

(r) Reference all tables and figures in the text by the numbers.

(s) Use bar charts to make accurate comparison of numerical data whenever possible.

(t) Line charts (or graphs) help to understand trends and allow accurate comparison between two or more numerical values.

2.5 Printing and copying quality

2.5.1 Check the toner box regularly to have consistent copy quality.

2.5.2 Make sure that no major image degradation occurs with reproductions of originals.

2.5.3 Use paper which has a reflectance of at least 70 percent.

2.5.4 Use low visual acuity and large type size if user is going to use the document under low illumination levels.

2.5.5 Readers prefer matt paper to medium or glossy paper.

2.5.6 High opacity paper is preferable.

2.5.7 Use black ink on white paper since it is more effective than white ink on black paper.

2.5.8 Develop and implement standards for changing printer ribbons, toner boxes, etc. to ensure a consistent print quality at all times.

3 ORGANISATIONAL ISSUES

3.1 Allow the prospective users of work cards to participate in the design of the document.

3.2 Check every individual instruction by testing it in the field situation.

3.3 If the document is going to include multiple copies, colour can be a useful processing aid.

3.4 Have a feedback system so that users are aware of how to correct an erroneous entry.

APPENDIX AC

REPETITIVE DEFECT MANAGEMENT

Note:- *This is a recommended practice.*

1 GENERAL

When a defect is written in the Tech Log, Licensed Aircraft Engineer (LAE) is expected to follow procedures in approved data to rectify the defect. The LAE follows the 'approved data' and the 'Instructions for Continued Airworthiness' then rectifies the defect and releases the aircraft to service. In some cases, that action does not completely rectify the defect and it reoccurs (sometimes in the next flight, 10 flights or sometimes 5 days later).

A lack of control of repetitive defects can lead to hazardous situations. Many of these repetitive defects do not lead systematically to accidents on their own but may increase the risk that system failure could occur at a critical phase of flight.

2 RECOMMENDED PRACTICES

The following description and practices should be addressed in the procedure:

2.1 Repetitive defect definitions (e.g. A recurring defect is one that reoccurs 3 times in 15 flight segments or 30 flight hours or 7 days).

2.2 How to identify or capture defects which are repetitive (relevant to the definition):

(a) A procedure may require LAE to review Technical Log records from the past 15 flight segments or 30 flight times or 7 days (depends on the definition), whenever a defect occurs

(b) Defect recording procedure must be designed in a way:

(i) To assist in identifying which problems are repetitive and allow the frontline LAE to be aware of defects that tend to be repetitive.

(ii) To enable flight crew to identify recurring/repetitive defects so that they can conduct their own risk assessments, make go/no-go decisions and/or be prepared to deal with the consequences of a repetitive defect recurring particularly at a critical phase of the flight e.g. radio altimeter failure during approach / landing.

2.3 How to control, monitor, analyze and investigate recurrent faults through the defect control system. A risk assessment should be carried out (collaboratively with the continuing airworthiness management function and flight operations) for repetitive defects impacting on safety critical systems such as flight controls, engine controls, autoflight etc.

Waiting for reliability programme to deal with such defects could potentially be too late.

2.4 The management of recurring defects should include:

(a) Tracking chronic or repetitive unserviceable items

(b) Documenting troubleshooting history

(c) Implementing instructions for corrective action

(d) Ensuring rectification takes into account the methodology used in previous repair attempts

2.5 How to utilize reliability programme. The reliability programme should be able to pro-actively monitor, in sub-chapter details, reliability and interpret trends to help identify faults that might have an impact on safety. Check the setting of alert levels, in-service rejection rates or recurrent faults and ensure that an effective investigation takes place to make sure corrective actions are taken.

2.6 The procedure should emphasize that temporary measures or trouble shooting, such as resetting computers or swapping components that only clear the fault temporarily should be avoided.

2.7 Beware intermittent faults repeatedly signed off without maintenance actions or disregarded or deferred for later rectification – these could lead to a bigger problem in the future if not investigated and rectified effectively. Emphasis should be placed on report faults correctly in the technical log book and have a clear policy on the management of system faults identified by the aircraft On-board Maintenance System or readouts.

2.8 Establish clear policies and coordination between the continuing airworthiness management function, the maintenance organization and all personnel involved in any maintenance activity.

2.9 Take due consideration of instructions and information from the Type Certificate Holder (TCH) about on the technical concern, such as Airworthiness Directives (ADs), Service Bulletins (SBs) etc.

2.10 Components refitted with an accepted Authorized Release Certificate or equivalent with insufficient trouble shooting and with no records of defects can be a common source of common faults. Do not re-introduce such equipment into the spares pool with no tracking of malfunctions or suspected defects through workshop reports.

2.11 The organizational culture should support technical staff with the available resources for effective fault investigations and it should be ensured that operational policies help to manage repetitive recurrent defects on aircraft or components effectively.

2.12 Link to safety reporting system if the defect meets the criteria in mandatory reportable occurrence list.

APPENDIX AD

CAT II AND CAT III SYSTEM RELIABILITY MONITORING

Note:- *This is a recommended practice.*

1 GENERAL

After obtaining the initial approval, the operations should be continuously monitored by the operator to detect any undesirable trends before they become hazardous. Flight crew reports may be used to achieve this.

As applicable to CAT II or III operations, to ensure the high level of performance and reliability required for aircraft automatic flight control and related systems for CAT II or III certification and operation, a system reliability monitoring must be established and consideration must be given to the levels of reliability assumed in qualifying the aircraft for Category II or III operations. It should be aligned with the list of systems required to be fully serviceable in order to qualify the aircraft for CAT II or III operations.

A procedure must be established to ensure that significant trends will be responded to promptly or all-weather classification will be suspended until remedial action has been taken. In case the special operation system reliability is controlled by other programme such as reliability programme, a cross-reference must be made.

2 RECOMMENDED PRACTICES

System Reliability Monitoring report should take into account the following information:

2.1 Total Approaches

- Total number of approaches tracked
- Number of satisfactory approaches tracked

by aircraft type, and visibility (Runway Visual Range) if known or recorded

2.2 Unsatisfactory Approaches

- Total number of unsatisfactory approaches tracked by airfield, aircraft registration, and reasons for unsatisfactory performance, if known, listed by the following categories:
  - Airborne equipment faults
  - Ground facility difficulties
  - Missed approaches because of ATC instructions
  - Other reasons

2.3 Unscheduled Component Removals

Total number of unscheduled removals of components of the related avionics systems

2.4 A procedure should be established to monitor the performance of the automatic landing system or Head-Up Display guidance Landing System (HUDLS) to touchdown performance, as appropriate, of each aircraft. It should include monitoring, tracking and controlling of the CAT III operational status of the aircraft and to achieve at least 95% successful CAT III landings in real and/or simulated conditions.

2.5 Other system reliability monitoring related to CAT II or III operation may be considered such as head-up display (HUD) system, airborne navigation system, flight control system, ground-speed indicating system, antiskid system, flight director, radio altimeter, auto-spoilers, automatic braking systems, autopilot mode switching, auto-throttle mode, reverse thrust initiation, automatic landing system, and other systems affected the low-altitude activities (Take-off, Go-around, Approach, Landing, Rollout in low-visibility condition).

2.6 The continuous monitoring must permit the detection of any decrease in the level of safety before it becomes hazardous by setting with alert levels to respond with any significant trends. The operator must continue to check his results and to take adequate actions by modifying the operating or maintenance procedures if necessary. The monitoring may also permit problems to be detected on a specified airfield (ILS, ATC procedures, etc.).

APPENDIX AE

PERIODIC REVIEW OF MANUAL

1 GENERAL

A procedural manual is tended to be an up-to-date document and, as a consequence, the air operator is required to conduct a review, preferably annually, to determine the need for amendments. This periodic review should not be confused with amending the manual when a specific need arises.

The review ensures the manual or procedure still serves its desired objectives, that all source documentation and preface information is current and applicable, identify any amendments required as well as assess its effectiveness, and ensure that it continues to be valid to the light of the operating experience of the company.

2 PROCEDURE DESCRIPTION

The procedure for periodic review of a manual should be consist of the following information:

(a) A clear interval for the periodic review of applicable manual
(b) Criteria to be taken into account during the review
(c) Who is responsible for the review of a manual
(d) How the review result will be documented
(e) Who is responsible for result review and approval
(f) How the approved result will be processed for record or manual amendment

3 PERIODIC REVIEW CRITERIA

3.1 The periodic review of a manual should take into account the following criteria:

(a) Compliance of existing or amendment of applicable regulatory requirements
(b) Design and application of manual which must observe human factor principle (Software-Liveware interfacing). See Appendix AB for guidelines.
(c) Overall validity of the manual's document control and format
(d) The review of organization chart validity (as applicable)
(e) Adequacy, accuracy, correctness, validity, and implementation effectiveness of procedures contained in the manual
(f) Corrective action implementation effectiveness of finding which has been incorporated in the manual from Quality Assurance system and External Audit
(g) Appropriateness of Personnel Responsibility, Qualification, Expected Competency, and their Training Needs
(h) Changes from operating experience of the company (new activity, scope, technology, etc.)
(i) Validity of all cross-references of documents made in the manual

3.2 Required by the regulation, the periodic review of the Air Operator's customized Aircraft Maintenance Programme (AMP) shall take into account the following criteria:

(a) The detailed schedule requirements continue to have practical applicability in the light of experience

(b) The detailed schedule requirements continue to adequately meet the maintenance needs of the aircraft if continuing airworthiness in the respective operating circumstances is to be ensured

- The results of the maintenance performed on each aircraft during the year may reveal that the current maintenance programme is not adequate. The records of all the maintenance performed on each aircraft during that year, including unscheduled maintenance should be reviewed
- Attention should be paid as to whether the defects found may have been prevented by introducing in the maintenance programme certain recommendations from the Design Approval Holder which were initially disregarded by the air operator
- Discrepancies linked to deficiencies in the content of the maintenance programme shall be informed to the Authority

(c) Variations from the original certification standard of the aircraft (as a result of modifications and recommendations of the manufacturer contained in maintenance manuals and Service Bulletins)

- Modifications and repairs embodied in the particular aircraft, which may require compliance to additional maintenance instructions (by Design Approval Holder)
- Changes in the aircraft configuration
- Applicable mandatory requirements such as airworthiness directives (ADs), airworthiness limitations, certification maintenance requirements and specific maintenance requirements contained in the type certificate data sheet (TCDS)

(d) The age and utilisation of the aircraft

- The operator shall consult Type Certificate Holder (TCH) to gain information on aircraft utilization assumptions applicable to particular Maintenance Planning Document. When the aircraft utilization differs significantly from those assumptions, the operator may need to adjust their program with TCH to ensure the maintenance programme applicability relevant to their aircraft profile
- There are also some cases where the maintenance programme is designed for all-profile aircraft. In such case, the operator shall consult TCH, keep consultation evidence available for the Authority, and clearly state in their AMP, as applicable
- Some intervals can only be adjusted with approval from the competent authority such as AD, Life-limited Parts, ALI, CMR, Structural sampling periods, CDCCL, etc.
- More frequent maintenance may be required as aircraft grow older

(e) The continuity of corrosion control programmes

- Level of corrosions and frequency found during aircraft inspections may vary from operational environment

(f) In addition, it should also take into account the following criteria:

(i) The criteria described in Item 3.1 of this appendix.

(ii) Changes in maintenance instructions by the TCH

(iii) In-service experience collected for the particular aircraft or for the fleet

(iv) Changes in the type and specificity of operations

APPENDIX AF

ASSOCIATED DOCUMENTS IN THE GMM

1 GENERAL

The GMM may be produced in the form of a single document or may consist of several separate documents.

- **Single document:** A GMM produced in accordance with CAAT requirements is a unique and complete document. It must contain all the information required to show compliance with the regulations including detailed maintenance procedures and detailed quality system procedures.
- **Several documents:** A GMM must contain at least the information as detailed in applicable regulations and guidance. The additional material may be published in separate documents which must be referenced from the GMM. In this case:
  - The GMM must cross refer to the associated procedures, documents, appendices, forms and all other lists which are managed separately (e.g. the list of certifying staff, the capability list, the list of sub-contractors, list of approved maintenance locations). Therefore, the GMM is expected to summarise the associated procedures and/or list references
  - Associated documents must meet the same rules as described for the GMM and must not refer to any foreign approval or other organisation's
  - Associated documents, procedures, forms, etc., must be provided to CAAT

The GMM shall contain information demonstrating compliance to the regulation. A GMM chapter referring only to an associated procedure is not acceptable.

For some operators, certain sections of the headings required by the regulations may be 'not applicable'. In this case, they shall be clearly annotated as such within the GMM.

Note 1: **Associated Procedure –** means a procedure providing additional and customised details on how the organisation intends to comply with applicable requirements

Note 2: **Associated List –** means any of the list required by regulations, when published separately from the GMM

Note 3: **Associated Form –** means any of a controlled document used to support the organisation activities to comply with applicable requirements

2 ASSOCIATED PROCEDURES, LISTS, AND FORMS

2.1.1 The associated procedures, lists, and forms to be included in the GMM are all those associated with the contents required by the regulations. They are considered a part of the GMM information.

In addition, the GMM together with the associated procedures shall cover all aspects of engineering and maintenance activities, including the provision and control of specialised services and detail the standards to which the operator intends to work.

2.1.2 It shall at least address the summary table of associated documents as **EXAMPLE** below:

Type of Document	Document reference	Indirect Approval*	Approved by	Eligible Amendments
(List all referred associated procedures manuals, lists, and forms)	*(enter a unique identification for each document)*	*(Yes / No)*	*(CAAT for non-internal approval / In case of indirect approval, enter the Title of the nominated person in charge)*	*(Amendments to which the indirect approval is limited as agreed with the assigned inspector)*
Approved Aircraft Maintenance Programmes	(…)	Yes	(…)	See GMM section x.x
Approved Minimum Equipment List	(…)	Yes	(…)	See GMM section x.x
Approved Training Programme Manual	(…)	Yes	(…)	See GMM section x.x
Approved Reliability Programme Manual	(…)	Yes	(…)	See GMM section x.x
Approved Extended Diversion Time Operations (EDTO) manual	(…)	Yes	(…)	See GMM section x.x
*Associated Procedures Manual***	(…)	Yes	(…)	Any change to the procedures that could affect the approval certificate
List of aircrafts managed	(…)	Yes	Quality Manager	Addition/removal of aircraft registrations from an existing aircraft configuration.
List of certificate maintenance review staff	(…)	NO	CAAT	
List of contracted and subcontracted organisation	(…)	NO	CAAT	
List of route stations, locations, or destinations with activity details	(…)	NO	CAAT	
Manpower calculation form	(…)	Yes	Accountable Manager	Variation less than 25% of the total staff number
Quality audit plan	(…)	Yes	Quality Manager	All changes
Copy of contracts or agreement for contracted and subcontracted work	(…)	Yes	Quality Manager	Changes that do not affect scope of contracted or sub-contracted work
Authorised Certifying staff and Support staff list	(…)	Yes	Quality Manager	Add or remove of staff
Procedures for Contracted Maintenance	(…)	Yes	Quality Manager	(…)
Forms Manual	(…)	(…)	(…)	(…)
(…)	(…)	(…)	(…)	(…)

* The indirect approval of each document shall be agreed and accepted with the Authority inspector. When an indirect approval is granted, it is important that the GMM describes the limits of the indirect approval privilege for each associated document.

Even if a document is subject to indirect approval, in the case of a change affecting the scope of work this document shall be approved by the CAAT (e.g. The operator changes from contracted flight recorders' readout or replay work to perform by themselves)

** when the operator develops second level procedures (for example to describe the details of engineering and maintenance processes in each area), those procedures shall be collected into a separate manual (e.g. associated procedures manual, or forms manual) to be also listed in this table.

2.1.3 In any case the CAAT must continue to receive a copy of all such minor changes when "indirectly" approved.

Associated documents which require direct approval (Except airworthiness manuals specified in the AOCR Chapter 9 item 1.2 and Appendix Y) shall be submitted to the CAAT for approval with the GMM.

2.1.4 The organisation shall notify the CAAT of any proposal to carry out any change listed below before such change takes place:

(a) Change of Organisation Name

(b) Change of postal address without any change of the actual site

(c) Change to the locations/facilities of the continuing airworthiness management function with or without amendment to the scope of approval (e.g. address change of any location already approved, Addition or cancellation of sites, etc.)

(d) Expansion or transfer of offices / facility layout (e.g. modification, extension, reduction, or reorganisation of an approved location, addition built working areas such as offices, or records keeping building within the approved facility, etc.)

(e) Change of the Accountable Manager or nominated persons or Certificate of Maintenance Review (CMR) staff as required by AOCR

(f) Reduction or increase of the staff number when the variation is more than 25% of the total staff number, or, when variation is affecting the approval

(g) Reduction or increase of the scope of work affecting the approval certificate (e.g. addition/removal of an aircraft type or engine model not included in the approval certificate, extension of the scope of approval to add privileges, etc.)

(h) Addition/removal of any organisation(s) working under the organisation quality system (Addition/removal of subcontractors)

(i) Reduction or increase of the scope of work not affecting the approval certificate (Addition/removal/change of an aircraft registration from an existing aircraft)

(j) Any change to the procedures and associated documents

(k) Any change affecting the approval certificate

APPENDIX AG

FLIGHT RECORDIND INSPECTION STANDARDS

1 GENERAL

Flight recorders, or “black boxes”, have become synonymous with aircraft accident and incident investigations. The recovery of the flight recorder and subsequent retrieval and analysis of the valuable information stored within the crash-protected memory is widely recognized both by the aviation industry and by the general public.

Having valid and useful information available not only contributes to effective accident or incident investigation but is an essential part of flight monitoring systems to improve operational efficiency. It also provides performance information of airframes and engines that can assist in continuing airworthiness.

Note 1:- ***Flight recorder readout*** *is an analysis of the recorded data from a flight recorder. The purpose of generating a readout report is to provide the documented evidence of the content of the flight recorder, together with any anomalies the replay organization has identified.*

Note 2:- ***Flight recorder replay*** *is the act of reconstructing the recorded situations / scenarios. The purpose of replaying is to generate a report on flight recorder’s content for subsequent review and validation.*

Note 3:- ***Intelligibility*** *is a measure of the speech contained in the cockpit voice / cockpit audio recording to determine how comprehensible, or able to be understood, the spoken content is.*

Note 4:- ***Parameter*** *is the aircraft system or motion required to be recorded, e.g. for control surface, flap position; and for aircraft velocity, airspeed.*

Note 5:- ***Quality*** *refers to the amount of data that cannot be recovered or is corrupted.*

Note 6:- ***Test*** *is a means of demonstrating compliance, using a test aircraft in a configuration representative of the configuration to be certified, in a ground and/or flight environment.*

Note 7:- *More detail on* ***Flight Recorder System Maintenance*** *can be found in* ***ICAO Doc 10104****.*

2 GENERAL REQUIREMENTS FOR FLIGHT RECORDING INSPECTION FACILITIES

Operators and/or contractors undertaking flight recording inspection shall take the following information into consideration when establishing facilities and developing procedures to perform flight recording inspection.

2.1 Hardware and Software Specific to the Readout of Flight Recorders

Flight recorder hardware and software are needed to retrieve the data from the recording medium and convert the data into a suitable format for readout. Flight recorder download hardware and software may be sourced from the specific flight recorder manufacturer. Most flight recorder manufacturers also supply readout software. However, it is becoming increasingly common for other companies to market flight recorder download and/or readout hardware and software.

All replay facilities shall have procedures in place to address the issues related to control of the hardware and software used for flight recorder readouts.

The procedures shall cover:

(a) The hardware and software are correct for the flight recorder system being examined

(b) Assessing proposed updates for current hardware and software

(c) Maintaining any hardware and software used for replaying flight recorders, including documenting system changes

(d) The processes for backing up any necessary files

(e) The considerations related to determining the need for new hardware and software

2.2 Procedures Specific to the Readout of Flight Recorders

(a) All replay facilities shall have procedures in place detailing the required means of operating the replay equipment. The procedure shall cover:

(i) How to establish that the correct replay equipment is being used

(ii) How to connect the replay and readout equipment

(iii) How to operate the replay and readout equipment

(iv) How to detect replay/readout equipment failures and initiate rectification

(b) All readout facilities shall have procedures in place to assist in assessing the detail of aircraft / flight information to determine whether it is possible to provide an accurate and useable readout.

The procedure shall cover:

(i) Checks for the existence of basic information, an example of which is examining the downloaded data file to ascertain if usable data is contained within the file, the duration of the recovered data and whether it meets the regulatory minimum required

(ii) Checks for assessing the information provided relating to the sample flight to determine what data can or cannot be gathered. An example could be related to the recording of an individual FDR parameter (i.e. if radio altitude data is not provided, the radio altitude parameter cannot be assessed)

(iii) The way in which the data will be assessed to determine the possible flight recorder readout report detail (i.e. is there sufficient information to assess the accuracy of the parameters or is it only possible to determine "shows" and "no shows"?)

(iv) The generation of the "report limitations" section of the FDR Report

2.3 Procedures for Replay Support Documentation

(a) All replay facilities shall have procedures in place covering the revision control of all flight recorder maintenance programme documents, including regulatory, technical and background documents.

The procedure shall cover:

(i) A list of all documents that are used in the assessment process, examples of relevant documents may include service history of the component, or a document showing the FDR recorded data format such as a FRED file

(ii) A list of the different types of media being used (e.g. CD, magnetic tape, etc.)

(iii) The method of configuration control being used

(iv) The means used to store them (including any environmental considerations)

(v) The location of all configured documents

(vi) The means of accessing those documents

(vii) The backup procedures

(viii) Full software and hardware descriptions and control of past versions, etc.

(ix) Security and control of access to flight recorder data

(b) These procedures shall also cover the provision and configuration control used to correlate specific documents to specific aircraft and flight recorders. Documents relating to a specific system may be needed to validate the maintenance of hardware and software. The same procedures should be applied to any other supporting data necessary for a flight recorder readout.

(c) An example of FDR data conversion documentation is included below. Information necessary to convert the FDR download file into engineering units can be found in:

(i) Data frame layout documents; and

(ii) Engineering conversion documents.

Note 1:- *Data frame layout (DFL) documents and engineering conversion documents can be in the flight recorder electronic documentation (FRED) format (ARINC 647A).*

Note 2:- *In cases where the recorder has the facility to store the FRED file within the crash survivable memory unit (CSMU), the operator should ensure that the FRED file is uploaded onto the recorder.*

2.4 Procedures for Staff Training

2.4.1 All replay facilities shall have procedures in place to address staff training.

Training procedures shall cover:

(a) The basic knowledge required to replay FDRs or ADRS. As a minimum this shall include:
  (i) Understanding of FDR or ADRS hardware design, maintenance and replay
  (ii) Assessing the accuracy/currency of the associated DFLs, etc.
  (iii) Understanding of the integration of the DFL of the data recovery and analysis systems
  (iv) Assessing the aircraft information provided

(b) The basic knowledge required to replay CVRs or CARS. As a minimum this shall include:
  (i) Understanding of CVR or CARS hardware design, maintenance and replay
  (ii) Assessing the quality of the recorded audio when replayed
  (iii) Understanding the file types available as recorded on the CVR or the CARS

(c) The basic knowledge required to replay AIRs or AIRS. As a minimum this shall include:
  (i) Understanding of AIR or AIRS hardware design, maintenance and replay
  (ii) Assessing the quality of the recorded images when replayed
  (iii) Understanding of the file types available as recorded on the AIR or AIRS

(d) The basic knowledge required to replay DLRs or DLRS. As a minimum this shall include:
  (i) Understanding of DLR or DLRS hardware design, maintenance and replay
  (ii) Assessing the accuracy/currency of the associated data link messages
  (iii) Understanding of the data link recovery and analysis systems
  (iv) Assessing the data link messages in relation to aircraft information provided

(e) The interpretation, relevance and application of:
  (i) ICAO SARPs and guidance material
  (ii) Legislation enacted by CAAT
  (iii) Flight recorder system standards
  (iv) Flight recorder manufacturer and aircraft integration information

(f) Using the necessary hardware and software tools

(g) Interpreting the output of those tools

(h) Drafting replay reports

(i) The requirement to update training (e.g. new recorders)

(j) The means of staff training, an example may be on the job training or participation in a formal course

(k) The method of keeping and updating staff training records

2.5 Flight Recorder System Readout Report

2.5.1 The content of the report shall detail the scope of work to be performed, the readout and analysis that was performed and any limitations in the readout process that may affect the determination of the integrity of the data readout.

For example, if the purpose of the readout is to confirm the correct presence of a FDR system discrete, accuracy of a sensor, or comply with a maintenance programme requirement to verify that parameters are being accurately recorded, the report should indicate which parameters were examined and any limitations in the analysis of the recorded information.

2.5.2 The aircraft operator is required to retain flight recorder system readout records or test reports for a minimum period of 90 days after the aircraft has been permanently withdrawn from service. The records must be retained in a safe manner and correctly identified to the aircraft and the flight to which it pertains.

2.6 Flight Data Recorder (FDR) System Readout Standards

2.6.1 Minimum performance for flight data recorder systems and airborne data recording systems are contained in Annex 6 and reference EUROCAE documents ED-112A and ED-155, respectively.

2.6.2 The FDR readout may be carried out by an operator that can demonstrate that they have the required equipment and competence to perform this task. This task may be sub-contracted by the operator to an external organization which is also required to have specific procedures detailing how an FDR readout will be performed and controlled.

2.6.3 The aircraft operator is responsible for ensuring the continued serviceability of the FDR system and retaining the relevant records required by the operational requirements. In addition, the validation of recorded data from a representative flight provides evidence of the FDR system performance in a flight dynamic situation that cannot be achieved during ground testing alone. Based on this, the complete recording stored by the FDR shall be downloaded and representative flight analysed to evaluate the continued serviceability of the FDR system.

2.6.4 Detection of FDR recording anomalies may be achieved in one of two ways:

(a) Validation of recorded data. To be able to validate the data, the readout facility will require details of the tests carried out or of the representative flight

(b) A combination of scheduled maintenance tasks and validation of recorded data

2.6.5 Several readout facilities have commented that their “customers” have erroneously assumed that the presentation/delivery of a readout report implies that the overall FDR system is serviceable, even when the content of the report is incomplete or implies that there may be faults within the system.

This misunderstanding has resulted in some FDR system faults remaining unresolved. Appropriate validation of the data provided, together with a clear statement of the limitations of the readout report, will help to minimize the chance of such dormant faults remaining undetected.

A replay organization should have sufficient information about the aircraft and its modification status to enable them to make an accurate replay. Unless the replay organization has sufficient information to determine the representative flight details for the recording, no attempt should be made to determine whether or not parameters are functioning correctly.

Any parameters that are “no shows” or have unusual characteristics should be noted on the report. The replay organization should not attempt to extrapolate additional information regarding the functionality of parameters (i.e. they should not attempt to derive information that is not directly available from the data obtained from the flight data recorder). The operator or recipient of the report has the responsibility of investigating any reported anomalies.

2.6.6 The aircraft operator shall ensure that an assessment is conducted to confirm that the quantity and quality of all data recovered from the FDR are correct for the data rate of the system and the recorder part number concerned.

2.6.7 It is the responsibility of the organization performing the readout to replay the FDR recorded data.

2.6.8 It is the responsibility of the replay organization responsible for performing the readout to report the FDR readout results. The FDR readout reports shall contain, as a minimum, the information presented in **Attachment 1 to this Appendix** which may be adapted for either aeroplanes or helicopters.

2.6.9 It is the responsibility of the aircraft operator to assess the FDR readout results to determine the actual serviceability of the FDR system and to assist in the scheduling of any necessary maintenance work.

2.6.10 The aircraft operator shall carefully analyse the FDR readout making use of the FDR readout report to establish whether it contains any anomalies. If anomalies are found, the aircraft operator shall investigate them to determine their cause and take corrective action.

2.6.11 Where an operator needs to contract this task, it shall be detailed in the General Maintenance Manual (GMM) and the contract established with the delegated organization. The operator, however, remains responsible for ensuring the task is carried out in accordance with the requirement in this Appendix.

2.6.12 If an anomaly is detected, the necessary rectification work shall be performed within the time period specified by the relevant master minimum equipment list (MMEL) or operational rule. Where a minimum equipment list (MEL) allowance is required, the MEL rectification interval starts when the FDR parameter(s) defects are identified.

2.7 Cockpit Voice Recorder (CVR) System Readout Standards

2.7.1 The minimum performance standards for cockpit voice recorder systems and cockpit audio recording systems are contained in EUROCAE documents ED-112A and ED-155, respectively.

2.7.2 The replay facility shall establish that recordings of adequate quality have been made on all channels for the test conditions stated below. In addition to subjective listening tests, proper signal recording level shall be confirmed.

2.7.3 The recording shall be played back in an area where the privacy and confidentiality of the recorded voices may be assured. This may require a separate room depending on the size of the organization performing the task.

2.7.4 It is recommended to use dedicated tools to visualize the audio signal (over time, frequency domain, energy levels, etc.) so as to check if a part of the recording seems affected by an audio anomaly. The BEA Study on Detection of Audio Anomalies on CVR Recordings may be referred to during the analysis of the CVR audio recordings.

2.7.5 The CVR analyst should focus on such part of the recording instead of selecting audio samples randomly. It is indeed essential for the reliability of the CVR audio assessment that the CVR analyst focus on where there might be a quality issue.

2.7.6 To assess the serviceability of the CVR system as configured on the aircraft, the following checks and functional tests are given as examples:

(a) Samples of voice communications transmitted from or received by the aircraft communications equipment at selected flight phases

(b) Samples of conversation on the flight deck at selected flight phases

(c) Voice communications of flight crew members on the flight deck, using the aircraft's interphone system

(d) Voice or audio signals identifying navigation aids introduced into the aircraft audio system

(e) Audio signals from alerting or warning devices on the flight deck, both fully integrated with the aircraft audio system and non-integrated

(f) General flight deck sounds, monitor the cockpit area microphone (CAM) to ensure that it satisfactorily records all cockpit sounds

(g) Each recording channel is functioning correctly and the source of information recorded on each channel is identifiable, e.g. pilot or co-pilot audio system

(h) Duration of the CVR recording is consistent with the recording interval specified by the regulatory authority applicable

(i) Examples of tests and checks usually performed are described in the guidance on CVR recording inspection and may be referred to during the analysis of the CVR audio recordings

Note:- *The guidance on CVR inspections available on the BEA website (http://www.bea.aero), details best practices in order that the CVR recording inspections are performed in an appropriate manner, applying methods to detect potential defects thus ensuring that the CVR audio recording is of good quality.*

2.7.7 Intelligibility is a measure of the ability for a speaker familiar with the language and accent to make an accurate transcript of the communications and of synthetic voice in audio callouts, warnings and alerts.

2.7.8 A quantitative measure of intelligibility can be made by comparing the recording with a calibrated level of noise, distortion or interference. An example of a quantitative measure is the testing by using speech transmission index (STI).

2.7.9 A qualitative measure of intelligibility can be made by appropriately trained analysts listening to the recording and assessing quality of the recorded speech. An example of a quality rating scale is included in the document Guidance on CVR recording Inspection (**http://www.bea.aero**). Another one is presented below:

CVR quality rating scale – The levels of recording quality are characterized by the following traits of the cockpit voice recorder information.

(a) **Excellent quality –** Virtually all of the crew conversations could be accurately and easily understood. A qualitative intelligibility assessment may indicate only one or two words that were not intelligible. Simultaneous cockpit/radio transmissions do not obscure crew conversation.

(b) **Good quality –** Most of the crew conversations could be accurately and easily understood. A qualitative intelligibility assessment may indicate several words or phrases that were not intelligible. Any loss in the transcript can be attributed to minor technical deficiencies or momentary dropouts in the recording system or to a large number of simultaneous cockpit/radio transmissions which do not obscure crew conversation.

(c) **Fair quality –** The majority of the crew conversations were intelligible. A qualitative intelligibility assessment may indicate passages where conversations were unintelligible or fragmented. This type of recording is usually caused by cockpit noise that obscures portions of the voice signals or by a minor electrical or mechanical failure of the CVR system that distorts or obscures the audio information.

(d) **Poor quality –** Extraordinary means had to be used to make some of the crew conversations intelligible. A qualitative intelligibility assessment may indicate fragmented phrases and conversations and may indicate extensive passages where conversations were missing or unintelligible. This type of recording is usually caused by a combination of a high cockpit noise level with a low voice signal (poor signal-to-noise ratio), or by a mechanical or electrical failure of the CVR system that severely distorts or obscures the audio information.

(e) **Unusable –** Crew conversations may be discerned, but neither ordinary nor extraordinary means made it possible to develop a meaningful transcript of the conversations. This type of recording is usually caused by an almost total mechanical or electrical failure of the CVR system.

2.7.10 With the above quality rating scale, a signal source with the rating “excellent”, “good” or “fair” should be considered as acceptable by the analyst.

Note:- *The guidance on CVR inspections available on the BEA website (http://www.bea.aero), details best practices in order that the CVR recording inspections are performed in an appropriate manner, applying methods to detect potential defects thus ensuring that the CVR audio recording is of good quality.*

2.7.11 Not only the duration of an issue is relevant but also the occurrence rate and the consequences on the intelligibility of the required signal sources should be considered as well. A phenomenon can be acceptable if it appears once or twice during a flight (the audio quality of the affected signal source could be considered "fair"). However, if the phenomenon occurs frequently resulting in unintelligible portions of recordings, the audio quality of the affected signal source should be considered as "poor". Refer to Table 2.7-1 below for examples of issues affecting a signal source and of the associated severity.

Table 2.7-1. Examples of issues affecting a signal source and of the associated severity

Issue severity	Examples of issues
MAJOR leading to "poor" rating for the affected signal	– One or more warning or callout is not recorded – Uncommanded interruption of the CAM signal – Unexplained variation of the CAM dynamic range – Hot mic function not operative (cf A/C CoFA) – CVR time code not available – CAM saturation (due to LF vibration) – Radio side tone is missing – One required signal source is missing from the recording (e.g. one mic signal not recorded) – Bad intelligibility of one mic source (e.g. speech through oxygen mask mic) – Quasi permanent physical saturation of a mic cell – Quasi permanent electrical saturation of a CVR channel – Mechanical and/or electrical interference providing useful data suppression – Default of CAM sensitivity – Default in the start/stop sequence
MEDIUM leading to "poor" or "fair" rating for the affected signals depending on the duration, and the occurrence rate of the issues	– Imbalance of audio event – Audio pollution generated by either the A/C or the recorder power supply – Low dynamic range of the recording on a CVR channel – Low recording level of warning and or callout – Over sensitivity of the CAM line* to hyper frequency activity (Wi-Fi, GSM**, …) – Over sensitivity of the CAM line* to ESD*** phenomenon – Over sensitivity of the CAM to air flow or conditioning noise (bleed air) – Phasing anomaly between CVR tracks – Side tone recorded with low level – Transitional saturation

* *CAM line: microphone+control or preamp unit+wiring*
** *Global system for mobile communications standard*
*** *Electrostatic discharge*

2.7.12 An air operator's own validation process of their CVR replays shall be detailed in the General Maintenance Manual (GMM). This replay shall be undertaken by competent staff and shall be documented (refer to template in **Attachment 2 to this Appendix**).

2.7.13 A procedure shall be established that enables the operator to perform a maintenance replay of the CVR, which shall highlight any deficiencies and the associated remedial actions.

2.7.14 In certain cases, an aircraft operator may lack sufficient resources to undertake CVR replay. In these cases, the replay, as detailed in the subject procedure, may be contracted to a third party by the operator. In these circumstances, the operator shall ensure the following:

(a) The contacting organization has the capability to replay CVRs in their approved procedures

(b) The CVR replay report shall include an assessment in accordance with the requirement in this Appendix

2.7.15 The analyst shall assess all CVR recordings against a quality rating scale. This quality rating scale shall be provided for reference in the CVR recording inspection report.

2.7.16 For a CVR recording to be considered representative, it should contain at least:

(a) Taxiing (for an aeroplane); and

(b) Any one of the following:

(i) Take-off and climb up to cruise altitude;

(ii) Descent phase from cruise altitude, approach and landing; and

(iii) For helicopters, hover and autorotation should be included (particular for certification process).

Otherwise, the analyst should mention in the report that a complete CVR recording inspection could not be performed. Experience shared by accident investigation authorities showed that the audio quality of a CVR recording may significantly vary depending on whether the aircraft is airborne or not.

2.7.17 The report shall identify the aircraft and flight concerned and shall confirm that all input channels were identified for the various test conditions. Details of the audio quality and intelligibility shall be noted, along with any other observations made from the recording. For helicopters, if rotor speed was announced by the crew, correlation between rotor speed announcements and recorded rotor speed data should be established and recorded. In all cases, the position of the area microphone in the particular aircraft should be stated in the report.

2.7.18 Templates of test results report where dedicated function associated to each channel is evaluated shall contain, as a minimum, the information presented in **Attachment 2 to this Appendix**. The report shall contain a column for each channel of the recording to note the results.

2.7.19 CVR audio recording quality shall be considered as unacceptable when the information required by regulations to be recorded by the CVR (as indicated by the applicable operating requirements) is unintelligible or inexplicably missing. For example, if a required source signal on a CVR channel is of poor quality and is not recorded by another channel, the CVR audio recording quality must be considered unacceptable.

Troubleshooting shall then be performed to identify the appropriate corrective actions. To ensure their effectiveness, a CVR audio quality check shall subsequently be performed.

2.8 Airborne Image Recording (AIR) System Readout Standards

2.8.1 The minimum performance standards for cockpit voice recorder systems and cockpit audio recording systems are contained in EUROCAE documents ED-112A and ED-155, respectively.

2.8.2 Following the flight testing of each new AIR installation, the recording so obtained shall be evaluated to confirm adequate quality. Similarly, it will be necessary to evaluate recordings obtained on a sampling basis from in-service flying or following cockpit modification, which may change the image environment to ensure that quality is maintained.

2.8.3 The replay equipment shall be located in a clean, quiet area which is sufficiently separated from other work areas to ensure the privacy of recordings. Access to the replay equipment shall be restricted to authorized personnel only.

2.8.4 Provision shall be made for the secure storage of AIR recording media and any copies made.

2.8.5 The operator shall ensure that the replay and evaluation of recordings are performed by personnel with adequate knowledge of AIR systems and aircraft operations and who have appropriate experience with the techniques used to evaluate recordings.

Note 1:- *Accident investigation authorities may be able to provide demonstrations which would assist the training of personnel.*

Note 2:- *Where possible, replay personnel should be given the opportunity to accompany the flight crew on an AIR test flight in order to become familiar with the test procedure.*

2.8.6 A test report and certification in a format acceptable to the Authority will be required to record the observations made from the evaluation of the recording.

2.8.7 The recording shall be checked to confirm that the required input sources are connected to the AIR system and that the image quality is acceptable, and by ensuring that the resolution available is sufficient to meet the specified resolution requirements. For combined recorders with AIR function, image recordings may be verified by correlating data values against announcements made by the flight crew.

2.8.8 The AIR test report shall contain, as a minimum, the information presented in **Attachment 3 of this Appendix**. The report may be supplemented by photographic or printed evidence obtained from selected extracts of the recording.

2.8.9 The spaces on the report, as applicable, shall be annotated with brief comments on the replay image quality. Remarks on these qualitative checks such as “good” or “not good” shall be defined in the procedures manual.

2.8.10 Samples of an in-flight recording during selected flight phases shall be replayed and assessed for quality.

2.8.11 An airborne flight crew-machine interface recording systems shall be considered unserviceable if the recording duration is less than required or if there is a period of poor quality images.

2.9 Data Link Recording (DLR) System Readout Standards

2.9.1 The minimum performance for data link recorder (DLR) systems and data link recording systems (DLRS) are contained in EUROCAE documents ED-112A and ED-155, respectively.

2.9.2 The operator shall ensure than means are provided to retrieve and decode recorded messages obtained via a digital data link. Similarly, a means to retrieve timing signals shall be provided.

2.9.3 Proper recording of a data link message shall be verified and correlated to announcements recorded by the flight crew.

2.9.4 The report may be supplemented by printing evidence obtained from selected extracts of the recording. The spaces on the report shall, as applicable, be annotated with brief comments on the replay signal quality.

2.9.5 Samples of in-flight recording during selected flight phases shall be replayed and assessed for integrity.

2.9.6 Data link recorder systems shall be considered unserviceable if the recording duration is less than required, if one or more messages are corrupted or not recorded.

ATTACHEMENT 1: EXAMPLE OF FDR READOUT REPORT

Logo

[FLIGHT DATA RECORDER READOUT REPORT]

[… ORGANISATION]

[Release Date]

[This report is solely documenting the outcome of the replay. The operator is responsible for the assessment of these results and determination that the FDR system is functioning correctly.]

[Logo]		**[…] ORGANISATION** FLIGHT DATA RECORDER READOUT REPORT		
Report Identifier		TH/ABC-001	**Contract Number**	TH/ABC-2016
Replay Date		12-Apr-2016	**Release Date**	14-Apr-2016
Aircraft Manufacturer/Model		Airbus/A320-200	**State of Registry**	Thailand
Aircraft Registration		HS-ABC	**Aircraft Serial Number**	012345
FDR Manufacturer/Model		L-3 Communika/FA2100 SSFDR		
FDR Part Number		2100-4043-02	**FDR Serial Number**	000123456
Data Duration	170 hours	**Parameters Replayed**	1200	
Audio Duration	120 minutes	**Recording Quality**	Good	
Data Link Duration	N/A	**Recording Content**	N/A	
Data Acquisition Unit				
Data Frame Layout Document Supplier		Airbus FDRPL SA	**Document Version**	9.0.0.383
Download Validation Equipment		ROSE (Read-Out Support Equipment) Analysis Unit		
Part Number	17TES0070	**Serial Number**	0123456	
Compliance with ICAO Annex 6 General FDR Parameter Requirement (refer to Table 3-B-1 below)				
Reason for Data Loss				
FDR Failure ☐	*Desynchronizations* ☐	*Other* ☐		
Report Interpretation				
This report is solely documenting the outcome of the replay. The operator is responsible for the assessment of these results and determination that the FDR system is functioning correctly.				
Action Officer		**Date**		

Compliance with *[regulatory criteria]*, for flight data recorders requirement

Note:- Refer to Air Operator Certificate Requirements (AOCR) Appendix V or Helicopter Operations Requirements (HOR) Appendix A for original parameter list included for illustration purposes.

Serial No.	***Parameter***	***Measurement range***	***Maximum sampling and recording interval (seconds)***	***Accuracy limits*** *(sensor input compared to FDR read-out)*	***Recording resolution***	***No shows***	***Anomalies noted***
1	Time (UTC when available, otherwise relative time count or GNSS time sync)	24 hours	4	±0.125%/h	1 s		
2	Pressure-altitude	–300 m (–1 000 ft) to maximum certificated altitude of aircraft +1 500 m (+5 000 ft)	1	±30 m to ±200 m (±100 ft to ±700 ft)	1.5 m (5 ft)		
3	Indicated airspeed or calibrated airspeed	95 km/h (50 kt) to maxV_{So} V_{So} to 1.2 V_D	1	±5% ±3%	1 kt (0.5 kt recommended)		
4	Heading (primary flight crew reference)	360°	1	±2°	0.5°		
5	Normal acceleration	–3 g to +6 g	0.125 (TC before 1 January 2016) 0.0625 (TC after 1 January 2016)	±1% of maximum range excluding datum error of ±5%	0.004 g		
6	Pitch attitude	±75° or usable range whichever is greater	0.25	±2°	0.5°		
7	Roll attitude	±180°	0.25	±2°	0.5°		
8	Radio transmission keying	On-off (one discrete)	1				
9	Power on each engine	Full range	1 (per engine)	±2%	0.2% of full range or the resolution required to operate the aircraft		
10	Trailing edge flap and cockpit control selection	Full range or each discrete position	2	±5% or as pilot's indicator	0.5% of full range or the resolution required to operate the aircraft		
11	Leading edge flap and cockpit control selection	Full range or each discrete position	2	±5% or as pilot's indicator	0.5% of full range or the resolution required to operate the aircraft		
12	Thrust reverser position	Stowed, in transit, and reverse	1 (per engine)				
13	Ground spoiler/speed brake selection (selection and position)	Full range or each discrete position	1	±2% unless higher accuracy uniquely required	0.2% of full range		
14	Outside air temperature	Sensor range	2	±2°C	0.3°C		
15	Autopilot/auto throttle/AFCS mode and engagement status	A suitable combination of discretes	1				
16	Longitudinal acceleration	±1 g	0.25 (TC before 1 January 2016) 0.0625 (TC after 1 January 2016)	±0.015 g excluding a datum error of ±0.05 g	0.004 g		
17	Lateral acceleration	±1 g	0.25 (TC before 1 January 2016) 0.0625 (TC after 1 January 2016)	±0.015 g excluding a datum error of ±0.05 g	0.004 g		

Serial No.	*Parameter*	*Measurement range*	*Maximum sampling and recording interval (seconds)*	*Accuracy limits* (sensor input compared to FDR read-out)	*Recording resolution*	*No shows*	*Anomalies noted*
18	Pilot input and/or control surface position-primary controls (pitch, roll, yaw)	Full range	0.25 (TC before 1 January 2016) 0.125 (TC after 1 January 2016)	±2° unless higher accuracy uniquely required	0.2% of full range or as installed		
19	Pitch trim position	Full range	1	±3% unless higher accuracy uniquely required	0.3% of full range or as installed		
20	Radio altitude	–6 m to 750 m (–20 ft to 2 500 ft)	1	±0.6 m (±2 ft) or ±3% whichever is greater below 150 m (500 ft) and ±5% above 150 m (500 ft)	0.3 m (1 ft) below 150 m (500 ft) 0.3 m (1 ft) + 0.5% of full range above 150 m (500 ft)		
21	Vertical beam deviation (ILS/GNSS/GLS glide path, MLS elevation, IRNAV/IAN vertical deviation)	Signal range	1	±3%	0.3% of full range		
22	Horizontal beam deviation (ILS/GNSS/GLS localizer, MLS azimuth, IRNAV/IAN lateral deviation)	Signal range	1	±3%	0.3% of full range		
23	Marker beacon passage	Discrete	1				
24	Master warning	Discrete	1				
25	Each NAV receiver frequency selection	Full range	4	As installed			
26	DME 1 and 2 distance (includes Distance to runway threshold (GLS) and Distance to missed approach point (IRNAV/IAN)	0–370 km (0–200 NM)	4	As installed	1 852 m (1 NM)		
27	Air/ground status	Discrete	1				
28	GPWS/TAWS/GCAS status (selection of terrain display mode including pop-up display status) and (terrain alerts, both cautions and warnings, and advisories) and (on/off switch position)	Discrete	1				
29	Angle of attack	Full range	0.5	As installed	0.3% of full range		
30	Hydraulics, each system (low pressure)	Discrete	2		0.5% of full range		
31	Navigation data (latitude/longitude, ground speed and drift angle)	As installed	1	As installed			
32	Landing gear and gear selector position	Discrete	4	As installed			
33	Groundspeed	As installed	1	Data should be obtained from the most accurate system	1 kt		

Serial No.	*Parameter*	*Measurement range*	*Maximum sampling and recording interval (seconds)*	*Accuracy limits* (sensor input compared to FDR read-out)	*Recording resolution*	*No shows*	*Anomalies noted*
34	Brakes (left and right brake pressure, left and right brake pedal position)	(Maximum metered brake range, discretes or full range)	1	±5%	2% of full range		
35	Additional engine parameters (EPR, N_1, indicated vibration level, N_2, EGT, fuel flow, fuel cut-off lever position, N_3, engine fuel metering valve position) (engine fuel metering valve position TC after 1 January 2023)	As installed		As installed	2% of full range		
36	TCAS/ACAS (traffic alert and collision avoidance system)	Discrete	1	As installed			
37	Wind shear warning	Discrete	1	As installed			
38	Selected barometric setting (pilot, co-pilot)	As installed	64	As installed	0.1 mb (0.01 in-Hg)		
39	Selected altitude (all pilot selectable modes of operation)	As installed	1	As installed	Sufficient to determine crew selection		
40	Selected speed (all pilot selectable modes of operation)	As installed	1	As installed	Sufficient to determine crew selection		
41	Selected Mach (all pilot selectable modes of operation)	As installed	1	As installed	Sufficient to determine crew selection		
42	Selected vertical speed (all pilot selectable modes of operation)	As installed	1	As installed	Sufficient to determine crew selection		
43	Selected heading (all pilot selectable modes of operation)	As installed	1	As installed	Sufficient to determine crew selection		
44	Selected flight path (all pilot selectable modes of operation) (course/DSTRK, path angle, final approach path (IRNAV/IAN))		1	As installed			
45	Selected decision height	As installed	64	As installed	Sufficient to determine crew selection		
46	EFIS display format (pilot, co-pilot)	Discrete(s)	4	As installed			
47	Multi-function/engine/alerts display format	Discrete(s)	4	As installed			
48	AC electrical bus status	Discrete(s)	4	As installed			
49	DC electrical bus status	Discrete(s)	4	As installed			
50	Engine bleed valve position	Discrete(s)	4	As installed			
51	APU bleed valve position	Discrete(s)	4	As installed			
52	Computer failure	Discrete(s)	4	As installed			
53	Engine thrust command	As installed	2	As installed			

Serial No.	*Parameter*	*Measurement range*	*Maximum sampling and recording interval (seconds)*	*Accuracy limits* (sensor input compared to FDR read-out)	*Recording resolution*	*No shows*	*Anomalies noted*
54	Engine thrust target	As installed	4	As installed	2% of full range		
55	Computed centre of gravity	As installed	64	As installed	1% of full range		
56	Fuel quantity in CG trim tank	As installed	64	As installed	1% of full range		
57	Head up display in use	As installed	4	As installed			
58	Para visual display on/off	As installed	1	As installed			
59	Operational stall protection, stick shaker and pusher activation	As installed	1	As installed			
60	Primary navigation system reference (GNSS, INS, VOR/DME, MLS, Loran C, localizer glideslope)	As installed	4	As installed			
61	Ice detection	As installed	4	As installed			
62	Engine warning each engine vibration	As installed	1	As installed			
63	Engine warning each engine over temperature	As installed	1	As installed			
64	Engine warning each engine oil pressure low	As installed	1	As installed			
65	Engine warning each engine over speed	As installed	1	As installed			
66	Yaw trim surface position	Full range	2	±3% unless higher accuracy uniquely required	0.3% of full range		
67	Roll trim surface position	Full range	2	±3% unless higher accuracy uniquely required	0.3% of full range		
68	Yaw or sideslip angle	Full range	1	±5%	0.5°		
69	De-icing and/or anti-icing systems selection	Discrete(s)	4				
70	Hydraulic pressure (each system)	Full range	2	±5%	100 psi		
71	Loss of cabin pressure	Discrete	1				
72	Cockpit trim control input position, Pitch	Full range	1	±5%	0.2% of full range or as installed		
73	Cockpit trim control input position, Roll	Full range	1	±5%	0.2% of full range or as installed		
74	Cockpit trim control input position, Yaw	Full range	1	±5%	0.2% of full range or as installed		
75	All cockpit flight control input forces (control wheel, control column, rudder pedal)	Full range (±311 N (±70 lbf), ± 378 N (±85 lbf), ± 734 N (±165 lbf))	1	±5%	0.2% of full range or as installed		
76	Event marker	Discrete	1				
77	Date	365 days	64				
78	ANP or EPE or EPU	As installed	4	As installed			

Serial No.	*Parameter*	*Measurement range*	*Maximum sampling and recording interval (seconds)*	*Accuracy limits* (sensor input compared to FDR read-out)	*Recording resolution*	*No shows*	*Anomalies noted*
79	Cabin pressure altitude (TC after 1 January 2023)	As installed (0 ft to 40 000 ft recommended)	1	As installed	100 ft		
80	Aeroplane computed weight (TC after 1 January 2023)	As installed	64	As installed	1% of full range		
81	Flight director command (TC after 1 January 2023)	Full range	1	± 2°	0.5°		
82	Vertical speed (TC after 1 January 2023)	As installed	0.25	As installed (32 ft/min recommended)	16 ft/min		

———————————————————

ATTACHEMENT 2: EXAMPLE OF CVR QUALITY ASSESSMENT REPORT

Organisation

Name:	
Date of assessment:	
Reference:	

Aircraft

Type:	
Registration:	
Serial number:	
Date of Certificate of Airworthiness:	
Hot-mic function installed:	
FSK function installed:	

Test

Type of test:	
Date of removal / dump:	
CVR data download tool:	
Test / download reference:	

Recorder and CVR track assignment

Device	Manufacturer	P/N	S/N	Mod dot(s)
Recorder:				
CVR track assignment	1:	2:	3:	
	4:	5:		

Recorder and CVR track assignment

Device	Manufacturer	P/N	EUROCAE compliance
Cockpit Area Microphone (CAM)			
C/U or preamplifier			
Audio management unit:			
V/UHF:			
V/UHF if various P/N:			
Headset / boomset:			
Hand microphone:			
Oxygen mask:			

Purpose and condition of the test

Attach if necessary the test programme, flight test report, and/or other technical document.

Audio system compliancy

EUROCAE reference:	

Inspection report release

Expected date:	

Contact / person in charge

Name:	
Position:	
Phone number:	
Email:	

Reference information: The table is to be built based on the information provided in the application details.

Result

Recording channel	1	2	3	4	5
Function	Captain	F/O	3rd and FSK	CAM	Mixed
Microphones					
Hot-mic boom	N/I	N/I	N/I	-	N/I
Hot-mic mask if applicable	N/I	N/I	N/I	-	N/I
Hot-mic level	N/I	N/I	N/I	-	N/I
Telephone/PA					
Radio reception	Fair	Good	N/I	-	Bad
Radio sidetone	Good	Good	N/I	-	Fair
Interphone	Fair	Good	N/I	-	Bad
Public address	-	-	-	-	-
Warnings*	Good	Good	Fair	-	Good
Signal level	Good	Good	N/I	-	Good
Area mic					
Cockpit sounds	-	-	-	Bad	-
Warnings/call-outs	-	-	-	Bad	-
Signal level	-	-	-	Bad	-
Time signal	Good	-	-	-	Good
Start – Stop function if applicable	Good	Good	Good	Good	Good
Channel duration					
Recorder Independent Power Supply (RIPS)/Alternate power supply if applicable				**Good**	
Additional information					
File name (in native format)	Air Flying - xxx				
File name (.wav)	Air Flying_ch1	Air Flying_ch2	Air Flying_ch3	Air Flying_wb	Air Flying_mb

**May only be recorded on the CAM channel depending on the audio system design.*

REMARKS / CONCLUSION: .....

It is certified that the above-mentioned recording has been evaluated in accordance with the terms of the contract/order applicable thereto and the requirements of the** [applicable criteria] **relating to the evaluation of such recordings.

SIGNED: .....

REPORT DATE: .....
For and on behalf of XXX Avionics

ATTACHMENT 3: EXAMPLE OF AIR TEST REPORT

XXX AVIONICS
YYYY Road
BANGKOK

CERTIFICATE NO.

TEST CERTIFICATE

AIRCRAFT IMAGE RECORDER — FLIGHT TEST EVALUATION

AIRCRAFT TYPE:……. REG:……..…… OPERATOR:……..……

CVR TYPE:……. SERIAL NO.:……..…… FLIGHT NO.:……..…….

Image recording quality check	
Spatial resolution	"Good" or "Not good"
Field of view	"Good" or "Not good"
Camera sensitivity	"Good" or "Not good"
Contrast	"Good" or "Not good"
Distortion	"Good" or "Not good"
Digital artefacts	"Good" or "Not good"

REMARKS: ……
……
……
……

It is certified that the above-mentioned recording has been evaluated in accordance with the terms of the contract/order applicable thereto and the requirements of the [applicable criteria] relating to the evaluation of such recordings.

SIGNED:…….. REPORT DATE:……..

for and on behalf of XXX Avionics

Organization approval reference ……