OM Part B - E545/E550

Version 4.8 of 01-Oct-2026

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AIR–OPS COMPLIANCE STATEMENT

ON BEHALF OF AIR SERVICE LIEGE	
The Operator's Nominated Person hereunder certifies that this list of effective pages and the contents of this volume of the Operations Manual satisfy the requirements of the Commission Regulation (EU) No 965/2012 of 5 October 2012 (and latest applicable amendments) laying down the technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council.	
(sign with date and signature) Digitaal ondertekend door Guy Ackaert Datum: 2026.10.30 14:14:16 +01'00' **G. Ackaert** Flight Operations Manager	*(sign with date and signature)* S. Bonsel Digitally signed by S. Bonsel Date: 2026.11.02 13:55:06 +01'00' **J. Hofland** Compliance Monitoring Manager
While the Operations Manual shall be globally acceptable by the Belgian CAA being the Competent Authority, elements of this manual are specifically accepted or approved in accordance with the regulation for CAT operations. For commercial air transport (CAT) operations, as part of its certification process, the Company has submitted to the Belgian CAA, this Operations Manual(1) accompanied with the filled in form 'Operators Cross Reference Checklist (O-CRCL)' and signed 'Statement of Compliance'. *Note 1: The Operations Manual is divided in Part A, Part B, Part C and Part D all published as a separate volume as defined in section I.1.3 of the OM Part A.*	

LIST OF EFFECTIVE PAGES

Chapter	Page	Revision	Date	Chapter	Page	Revision	Date
		4.8	01-Oct-2026	I	18	4.7	15-Apr-2026
I	1	4.2	01-Mar-2024	I	19	4.7	15-Apr-2026
I	2	4.8	01-Oct-2026	I	20	4.7	15-Apr-2026
I	3	4.7	15-Apr-2026	I	21	4.7	15-Apr-2026
I	4	4.7	15-Apr-2026	I	22	4.7	15-Apr-2026
I	5	4.8	01-Oct-2026	I	23	4.2	01-Mar-2024
I	6	4.8	01-Oct-2026	0	1	4.2	01-Mar-2024
I	7	4.2	01-Mar-2024	0	2	4.7	15-Apr-2026
I	8	4.8	01-Oct-2026	0	3	4.2	01-Mar-2024
I	9	4.7	15-Apr-2026	0	4	4.2	01-Mar-2024
I	10	4.7	15-Apr-2026	1	1	4.2	01-Mar-2024
I	11	4.7	15-Apr-2026	1	2	4.2	01-Mar-2024
I	12	4.7	15-Apr-2026	1	3	4.5	02-Feb-2026
I	13	4.7	15-Apr-2026	1	4	4.2	01-Mar-2024
I	14	4.7	15-Apr-2026	1	5	4.7	15-Apr-2026
I	15	4.7	15-Apr-2026	1	6	4.2	01-Mar-2024
I	16	4.7	15-Apr-2026	1	7	4.2	01-Mar-2024
I	17	4.7	15-Apr-2026	1	8	4.7	15-Apr-2026

(continued)

Chapter	Page	Revision	Date	Chapter	Page	Revision	Date
1	9	4.3	06-Dec-2024	2	25	4.2	01-Mar-2024
1	10	4.5	02-Feb-2026	2	26	4.2	01-Mar-2024
1	11	4.7	15-Apr-2026	2	27	4.2	01-Mar-2024
1	12	4.2	01-Mar-2024	2	28	4.2	01-Mar-2024
1	13	4.7	15-Apr-2026	2	29	4.2	01-Mar-2024
1	14	4.7	15-Apr-2026	2	30	4.2	01-Mar-2024
1	15	4.3	06-Dec-2024	2	31	4.5	02-Feb-2026
1	16	4.2	01-Mar-2024	2	32	4.7	15-Apr-2026
1	17	4.2	01-Mar-2024	2	33	4.5	02-Feb-2026
1	18	4.2	01-Mar-2024	2	34	4.2	01-Mar-2024
1	19	4.2	01-Mar-2024	2	35	4.2	01-Mar-2024
1	20	4.2	01-Mar-2024	2	36	4.6	16-Feb-2026
1	21	4.2	01-Mar-2024	2	37	4.6	16-Feb-2026
1	22	4.3	06-Dec-2024	2	38	4.6	16-Feb-2026
1	23	4.2	01-Mar-2024	2	39	4.2	01-Mar-2024
1	24	4.5	02-Feb-2026	2	40	4.2	01-Mar-2024
1	25	4.2	01-Mar-2024	2	41	4.5	02-Feb-2026
1	26	4.2	01-Mar-2024	2	42	4.7	15-Apr-2026
1	27	4.2	01-Mar-2024	2	43	4.2	01-Mar-2024
1	28	4.2	01-Mar-2024	2	44	4.2	01-Mar-2024
1	29	4.2	01-Mar-2024	2	45	4.2	01-Mar-2024
2	1	4.2	01-Mar-2024	2	46	4.2	01-Mar-2024
2	2	4.2	01-Mar-2024	2	47	4.7	15-Apr-2026
2	3	4.5	02-Feb-2026	2	48	4.2	01-Mar-2024
2	4	4.2	01-Mar-2024	2	49	4.2	01-Mar-2024
2	5	4.3	06-Dec-2024	2	50	4.2	01-Mar-2024
2	6	4.2	01-Mar-2024	2	51	4.5	02-Feb-2026
2	7	4.2	01-Mar-2024	2	52	4.3	06-Dec-2024
2	8	4.7	15-Apr-2026	2	53	4.2	01-Mar-2024
2	9	4.3	06-Dec-2024	2	54	4.2	01-Mar-2024
2	10	4.5	02-Feb-2026	2	55	4.2	01-Mar-2024
2	11	4.2	01-Mar-2024	2	56	4.2	01-Mar-2024
2	12	4.2	01-Mar-2024	2	57	4.2	01-Mar-2024
2	13	4.2	01-Mar-2024	2	58	4.2	01-Mar-2024
2	14	4.6	16-Feb-2026	2	59	4.3	06-Dec-2024
2	15	4.2	01-Mar-2024	2	60	4.2	01-Mar-2024
2	16	4.2	01-Mar-2024	2	61	4.2	01-Mar-2024
2	17	4.2	01-Mar-2024	2	62	4.2	01-Mar-2024
2	18	4.6	16-Feb-2026	2	63	4.2	01-Mar-2024
2	19	4.7	15-Apr-2026	2	64	4.2	01-Mar-2024
2	20	4.7	15-Apr-2026	2	65	4.2	01-Mar-2024
2	21	4.7	15-Apr-2026	2	66	4.2	01-Mar-2024
2	22	4.2	01-Mar-2024	2	67	4.2	01-Mar-2024
2	23	4.2	01-Mar-2024	2	68	4.2	01-Mar-2024
2	24	4.2	01-Mar-2024	2	69	4.3	06-Dec-2024

(continued)

Chapter	Page	Revision	Date	Chapter	Page	Revision	Date
2	70	4.2	01-Mar-2024	3	23	4.2	01-Mar-2024
2	71	4.2	01-Mar-2024	3	24	4.6	16-Feb-2026
2	72	4.2	01-Mar-2024	3	25	4.2	01-Mar-2024
2	73	4.5	02-Feb-2026	3	26	4.3	06-Dec-2024
2	74	4.2	01-Mar-2024	3	27	4.2	01-Mar-2024
2	75	4.2	01-Mar-2024	3	28	4.5	02-Feb-2026
2	76	4.5	02-Feb-2026	3	29	4.5	02-Feb-2026
2	77	4.2	01-Mar-2024	3	30	4.2	01-Mar-2024
2	78	4.2	01-Mar-2024	3	31	4.2	01-Mar-2024
2	79	4.3	06-Dec-2024	3	32	4.2	01-Mar-2024
2	80	4.2	01-Mar-2024	3	33	4.2	01-Mar-2024
2	81	4.2	01-Mar-2024	3	34	4.2	01-Mar-2024
2	82	4.5	02-Feb-2026	3	35	4.5	02-Feb-2026
2	83	4.2	01-Mar-2024	4	1	4.2	01-Mar-2024
2	84	4.2	01-Mar-2024	4	2	4.2	01-Mar-2024
2	85	4.2	01-Mar-2024	4	3	4.7	15-Apr-2026
2	86	4.2	01-Mar-2024	5	1	4.5	02-Feb-2026
2	87	4.2	01-Mar-2024	5	2	4.7	15-Apr-2026
2	88	4.2	01-Mar-2024	6	1	4.5	02-Feb-2026
2	89	4.2	01-Mar-2024	6	2	4.2	01-Mar-2024
2	90	4.3	06-Dec-2024	6	3	4.2	01-Mar-2024
2	91	4.2	01-Mar-2024	6	4	4.2	01-Mar-2024
2	92	4.2	01-Mar-2024	7	1	4.5	02-Feb-2026
3	1	4.2	01-Mar-2024	8	1	4.2	01-Mar-2024
3	2	4.2	01-Mar-2024	9	1	4.2	01-Mar-2024
3	3	4.2	01-Mar-2024	10	1	4.2	01-Mar-2024
3	4	4.2	01-Mar-2024	10	2	4.7	15-Apr-2026
3	5	4.3	06-Dec-2024	10	3	4.2	01-Mar-2024
3	6	4.2	01-Mar-2024	10	4	4.2	01-Mar-2024
3	7	4.2	01-Mar-2024	10	5	4.2	01-Mar-2024
3	8	4.2	01-Mar-2024	10	6	4.7	15-Apr-2026
3	9	4.2	01-Mar-2024	10	7	4.5	02-Feb-2026
3	10	4.2	01-Mar-2024	10	8	4.7	15-Apr-2026
3	11	4.2	01-Mar-2024	10	9	4.7	15-Apr-2026
3	12	4.2	01-Mar-2024	10	10	4.2	01-Mar-2024
3	13	4.5	02-Feb-2026	10	11	4.2	01-Mar-2024
3	14	4.2	01-Mar-2024	10	12	4.2	01-Mar-2024
3	15	4.5	02-Feb-2026	10	13	4.2	01-Mar-2024
3	16	4.2	01-Mar-2024	10	14	4.2	01-Mar-2024
3	17	4.2	01-Mar-2024	10	15	4.2	01-Mar-2024
3	18	4.7	15-Apr-2026	10	16	4.2	01-Mar-2024
3	19	4.2	01-Mar-2024	10	17	4.2	01-Mar-2024
3	20	4.2	01-Mar-2024	10	18	4.2	01-Mar-2024
3	21	4.2	01-Mar-2024	10	19	4.2	01-Mar-2024
3	22	4.2	01-Mar-2024	10	20	4.7	15-Apr-2026

(continued)

Chapter	Page	Revision	Date	Chapter	Page	Revision	Date
10	21	4.8	01-Oct-2026	10	37	4.2	01-Mar-2024
10	22	4.8	01-Oct-2026	10	38	4.5	02-Feb-2026
10	23	4.2	01-Mar-2024	10	39	4.2	01-Mar-2024
10	24	4.2	01-Mar-2024	11	1	4.2	01-Mar-2024
10	25	4.7	15-Apr-2026	11	2	4.6	16-Feb-2026
10	26	4.2	01-Mar-2024	11	3	4.2	01-Mar-2024
10	27	4.7	15-Apr-2026	11	4	4.2	01-Mar-2024
10	28	4.2	01-Mar-2024	11	5	4.2	01-Mar-2024
10	29	4.4	01-Jan-2025	11	6	4.2	01-Mar-2024
10	30	4.2	01-Mar-2024	11	7	4.2	01-Mar-2024
10	31	4.2	01-Mar-2024	11	8	4.2	01-Mar-2024
10	32	4.2	01-Mar-2024	11	9	4.4	01-Jan-2025
10	33	4.5	02-Feb-2026	12	1	4.2	01-Mar-2024
10	34	4.5	02-Feb-2026	A	1	4.8	01-Oct-2026
10	35	4.5	02-Feb-2026	A	2	4.4	01-Jan-2025
10	36	4.7	15-Apr-2026	A	3	4.4	01-Jan-2025

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2.0	15-Jan-17	01-Feb-17	08-Feb-17	G. Van Keer
2.1	30-Jul-18	07-Aug-18	10-Aug-18	K. Van de Sijpe
3.0	01-Feb-20	28-May-20	30-May-20	K. Van de Sijpe
3.1	01-Sep-20	28-Oct-20	02-Nov-20	K. Van de Sijpe
Revision numbering as per OM Part A Section I.2.2 Version 13.0 (and later revisions) for the revisions below this line				
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4.1	09-Jan-23	27-Apr-23	27-Apr-23	K. Van de Sijpe
4.2	01-Mar-24	29-Mar-24	29-Mar-24	K. Van de Sijpe
4.3	06-Dec-24	20-Dec-24	20-Dec-24	G. Ackaert
4.4	01-Jan-25	25-Mar-25	25-Mar-25	G. Ackaert
4.5	02-Feb-26	20-Feb-26	20-Feb-26	G. Ackaert
4.6	16-Feb-26	01-Apr-26	01-Apr-26	G. Ackaert
4.7	15-Apr-26	29-May-26	29-May-26	G. Ackaert
4.8	01-Oct-26	05-Nov-26		

RECORD OF TEMPORARY / URGENT REVISIONS				
Temporary / urgent revision	Issue date	Effective date	Publication date	Inserted by and/or remarks
~~1~~	~~01-Dec-16~~	~~01-Dec-16~~	~~04-Dec-16~~	Incorporated into Version 2.0
~~2~~	~~10-Jan-17~~	~~16-Jan-17~~	~~17-Jan-17~~	Incorporated into Version 2.0

LIST OF CHANGES

Page	Comment
	Section I Administration and Control updated to introduce version 4. 8 of this manual;
10-21	(NON PRIOR APPROVAL): Section 10.1.9.3: Updated the life jacket type to a single chamber model and removed whistle;
A-1	(NON PRIOR APPROVAL):Annex 2: Updated passenger safety briefing cards with single-chamber life jackets without whistle.

TABLE OF CONTENT

ORO.MLR.100 (a), ORO.MLR.100 AMC3

I	ADMINISTRATION AND CONTROL	I-1
0	SECTION 0 - UNITS OF MEASUREMENT AND GENERAL INFORMATION	0-1
0.1	Units and conversions	0-1
0.2	Aircraft information	0-2
0.3	Aircraft dimensions	0-3
1	SECTION 1 - LIMITATIONS	1-1
1.1	Certification status	1-1
1.2	Seating configuration	1-2
1.2.1	General	1-2
1.2.1.1	Aircraft with registration OO-NEY	1-2
1.2.1.2	Aircraft with registration PH-LGD	1-4
1.2.2	Passengers with reduced mobility and special category passengers	1-6
1.2.2.1	Aircraft with registration OO-NEY	1-7
1.2.2.2	Aircraft with registration PH-LGD	1-8
1.2.3	Multiple occupancy of a seat	1-9
1.2.4	Passengers travelling with a pet of more than 8 kg in the cabin	1-10
1.2.4.1	Aircraft with registration OO-NEY	1-10
1.2.4.2	Aircraft with registration PH-LGD	1-11
1.3	Kinds of operation	1-12
1.4	Types of operation	1-13
1.5	Crew composition	1-16
1.6	Mass and balance limitation	1-17
1.6.1	Aircraft mass and balance design limitations	1-17
1.6.2	Baggage and storage limitations	1-18
1.7	Center of gravity limitation	1-19
1.8	Speed limitation	1-21
1.9	Flight envelope limitation	1-22
1.9.1	Take-off and landing operational limitations	1-22
1.9.2	En-route operational limitations	1-23

1.10	Wind limits	1-24
1.11	Performance limitations for applicable configurations	1-25
1.12	Runway slope	1-26
1.13	Limitations on wet or contaminated runways	1-26
1.14	Airframe contamination	1-27
1.14.1	Ice and rain protection	1-27
1.14.2	Operations in severe icing conditions	1-27
1.15	System limitations	1-29
2	**SECTION 2 - NORMAL PROCEDURES**	2-1
2.1	General procedures	2-1
2.1.1	Introduction	2-1
2.1.2	Manufacturer standard operating procedures	2-1
2.1.3	Crew resource management procedures	2-2
2.1.4	Sterile cockpit concept	2-3
2.1.5	Manufacturer and Company checklists	2-4
2.1.5.1	Use of normal checklists	2-4
2.1.5.2	Location of checklists	2-7
2.1.6	Use of standard calls	2-8
2.1.7	Normal crew tasks	2-10
2.1.8	Transferring control of the aircraft	2-10
2.1.9	Use of autopilot and autothrottle	2-11
2.1.9.1	General	2-11
2.1.9.2	Automation levels	2-11
2.1.9.3	Use of touch control steering (TCS)	2-12
2.1.9.4	Selection of automation	2-12
2.1.9.5	Management of the autopilot and autothrottle	2-12
2.1.9.6	Flight management annunciator callouts	2-13
2.1.10	Communications	2-14
2.1.10.1	General	2-14
2.1.10.2	Communication rules	2-14

2.1.10.3	HF transceiver and SELCAL	2-15
2.1.10.4	CPDLC communication	2-15
2.1.11	Briefing procedures	2-16
2.1.12	Flight Crew Member occupied	2-16
2.1.13	Use of aircraft electronic charts	2-17
2.1.14	Electronic flight bag	2-18
2.1.14.1	General	2-18
2.1.14.2	Specific charging procedures	2-18
2.1.14.3	Pre-flight procedures	2-19
2.1.14.4	Before departure procedures	2-19
2.1.14.5	Taxiing the aircraft	2-20
2.1.14.6	Take Off / Departure	2-20
2.1.14.7	In-flight procedures	2-20
2.1.14.8	Approach procedures	2-21
2.1.14.9	Post-flight procedures	2-21
2.1.15	Threat and error management	2-22
2.1.15.1	General	2-22
2.1.15.2	Threat and error management part of crew briefings	2-23
2.1.16	Clean cockpit concept	2-24
2.1.17	Use of erroneous take-off parameters	2-26
2.1.17.1	General	2-26
2.1.17.2	Precautionary procedure	2-26
2.1.17.3	Gross error check	2-26
2.2	Pre-flight procedures	2-27
2.2.1	General	2-27
2.2.2	Fueling procedures	2-29
2.2.3	APU operations	2-29
2.2.4	Flight ID	2-30
2.2.5	Transponder operations	2-30
2.3	Pre-departure procedures	2-31

2.4	Altimeter setting and checking procedures	2-32
2.4.1	General	2-32
2.4.2	Altimeter corrections	2-35
2.4.2.1	General	2-35
2.4.2.2	Pressure correction	2-35
2.4.2.3	Temperature correction	2-35
2.4.2.4	Wind correction	2-35
2.4.3	Standby altimeter	2-36
2.4.4	Radio altimeter	2-36
2.4.5	Altitude selector	2-36
2.5	Taxi, take-off and climb procedures	2-38
2.5.1	Taxi procedures	2-38
2.5.2	Towing and Pushback procedures	2-41
2.5.2.1	General	2-41
2.5.2.2	Braking procedures	2-41
2.5.2.3	Communication with ground personnel	2-41
2.5.3	Thrust reverser check procedures	2-41
2.5.4	Take-off procedures	2-42
2.5.4.1	Take-off briefing	2-42
2.5.4.2	Crosswind take-off procedures	2-44
2.5.4.3	Turns immediately after take-off	2-44
2.5.5	Climb procedures	2-45
2.6	Noise abatement procedures	2-46
2.6.1	General	2-46
2.6.2	Noise preferential runways	2-46
2.6.3	Noise abatement departure procedure	2-47
2.6.3.1	Noise abatement departure procedure 1	2-48
2.6.3.2	Noise abatement departure procedure 2	2-49
2.6.4	Noise abatement approach procedure	2-50
2.6.5	Noise abatement landing procedure	2-50

2.7	Cruise and descent procedures	2-51
2.7.1	Cruise procedures	2-51
2.7.2	In-flight fuel management policy and procedures	2-51
2.7.3	Descent procedures	2-51
2.7.4	‘Rushing during descent’ principle and dangers	2-52
2.7.4.1	Introduction	2-52
2.7.4.2	Benefits of a stabilised approach	2-52
2.7.4.3	Factors involved in unstabilised approaches	2-53
2.7.4.4	Company prevention strategy and personal lines of defence	2-54
2.8	Approach, landing preparation and briefing procedures	2-56
2.8.1	Monitoring	2-56
2.8.2	Uncertainty	2-56
2.8.3	Approach, landing and go-around briefing	2-56
2.8.4	Stabilised approach	2-57
2.8.5	Visual reference	2-58
2.8.6	Decision to land	2-58
2.8.7	Vapp and Vref	2-59
2.9	VFR approach procedures	2-60
2.10	IFR approach procedures	2-61
2.10.1	Conventional precision approach	2-61
2.10.1.1	General	2-61
2.10.1.2	Outer marker check	2-61
2.10.1.3	Navigation set-up procedures	2-61
2.10.2	Conventional non-precision approach	2-62
2.10.2.1	General	2-62
2.10.2.2	Altimeter procedures	2-62
2.10.2.3	Navigation set-up procedures	2-63
2.10.2.4	Approach callout procedures	2-63
2.10.3	RNP APCH operations	2-64
2.10.3.1	Aircraft specific procedures and limitations for NPA GNSS, APV BARO, SBAS APV and SBAS CAT I approach	2-65

2.10.3.2	NPA GNSS approach additional specific procedures and limitations	2-66
2.10.3.3	APV BARO additional specific approach procedures and limitations	2-67
2.10.3.4	SBAS APV and SBAS CAT I additional specific approach procedures and limitations	2-68
2.10.3.5	Navigation set-up procedures	2-68
2.10.3.6	Approach callout procedures	2-68
2.11	Visual approach and circling	2-69
2.11.1	Visual approach	2-69
2.11.2	Circling approach	2-70
2.11.3	Contact approach	2-70
2.12	Missed approach	2-71
2.12.1	Go-around procedure	2-71
2.12.2	Balked landing procedure	2-72
2.12.2.1	General	2-72
2.12.2.2	Before touchdown	2-72
2.12.2.3	After touchdown	2-72
2.13	Normal landing	2-73
2.14	Post landing procedures	2-74
2.15	Operation on wet and contaminated runways	2-76
2.16	Steep approach operation	2-77
2.17	NAT HLA MNPS operation	2-78
2.18	RVSM operation	2-79
2.19	Performance-based navigation	2-80
2.20	ETOPS operation	2-81
2.21	QFE altimeter setting and metric units operation procedures	2-82
2.21.1	General	2-82
2.21.2	QFE procedures	2-82
2.21.3	Metric operation procedures	2-83
2.22	Low visibility operation	2-84
2.23	Cold weather operation	2-85
2.23.1	General	2-85

2.23.2	Pre-flight inspection procedure	2-85
2.23.3	Ground de-ice and anti-ice procedures	2-86
2.23.4	Taxi procedure	2-87
2.23.5	Before take-off procedure	2-87
2.23.6	Take-off procedure	2-87
2.23.7	Landing procedure	2-88
2.23.8	Precautions before leaving the aircraft in cold weather	2-88
2.24	Automatic dependent surveillance - broadcast operation	2-89
2.24.1	Aircraft specific normal procedures	2-89
2.24.2	Aircraft specific contingency procedures	2-90
2.25	Controller pilot data link communication	2-90
2.25.1	Aircraft specific normal procedures	2-91
2.25.2	Aircraft specific contingency procedures	2-91
2.26	specific system and/or equipment additional normal procedures	2-92
3	**SECTION 3 - ABNORMAL AND EMERGENCY PROCEDURES**	3-1
3.0	General	3-1
3.0.1	Priorities	3-1
3.0.2	Authority	3-3
3.0.3	Notification	3-3
3.0.4	Use of checklists	3-4
3.0.5	Abnormal and emergency procedures	3-6
3.0.6	Task distribution	3-8
3.0.7	The decision-making process and problem solving	3-9
3.0.8	CPDLC emergency use	3-10
3.1	Crew incapacitation	3-11
3.1.1	Obvious incapacitation	3-11
3.1.2	Subtle incapacitation	3-11
3.1.3	Preventive measures to detect incapacitation	3-12
3.1.4	Actions guidelines	3-12
3.1.4.1	Take over the aircraft	3-12

3.1.4.2	Take care of the incapacitated Flight Crew Member	3-12
3.1.4.3	Prepare for landing	3-14
3.1.5	Other considerations	3-14
3.2	Fire and smoke drills	3-15
3.2.1	General	3-15
3.2.2	Definitions	3-15
3.2.3	Causes of in-flight fires	3-16
3.2.3.1	Wiring failures	3-16
3.2.3.2	Electrical component failure	3-16
3.2.3.3	Lightning strikes	3-16
3.2.3.4	Bleed air leaks	3-16
3.2.3.5	Faulty circuit protection	3-16
3.2.3.6	Battery thermal runaway	3-16
3.2.4	Fire prevention	3-17
3.2.4.1	Resetting of tripped circuit breakers	3-17
3.2.4.2	Handling of a crushed or damaged portable electronic device (PED)	3-17
3.2.5	Available cockpit / cabin firefighting equipment	3-18
3.2.5.1	Cargo fire protection	3-18
3.2.5.2	Halotron BrX (non-halon) fire extinguisher	3-18
3.2.5.3	Water fire extinguisher	3-18
3.2.5.4	Water or non-flammable liquids	3-18
3.2.5.5	Protective breathing equipment	3-18
3.2.5.6	Battery risk management system	3-18
3.2.5.7	Crash axe	3-19
3.2.6	Firefighting procedures	3-20
3.2.6.1	General	3-20
3.2.6.2	Toilet fire	3-21
3.2.6.3	Concealed fire	3-21
3.2.6.4	Waste bin fire	3-21
3.2.6.5	Baggage fire	3-22

3.2.6.6	Passenger seat fire	3-22
3.2.6.7	Electrical fire	3-22
3.2.6.8	Battery / PED fire / smoke (in the cabin)	3-23
3.2.6.9	Battery / PED fire / smoke in the cockpit	3-24
3.3	Unpressurised and partially pressurized flights	3-24
3.3.1	General	3-24
3.3.2	Decompression in flight	3-24
3.4	Exceeding structural limits such as an overweight landing	3-25
3.5	Exceeding cosmic radiation limits	3-25
3.6	Lightning strikes	3-26
3.6.1	General	3-26
3.6.2	Lightning strike likely to occur	3-27
3.6.3	Aircraft hit by lightning	3-27
3.6.4	After landing procedures	3-27
3.7	Distress communications	3-28
3.7.1	Frequencies and codes	3-28
3.7.2	Distress signals	3-28
3.7.3	Urgency signals	3-29
3.7.4	Communication failure	3-29
3.8	Engine failure	3-30
3.8.1	V1 concept	3-30
3.8.2	Engine failure below V1	3-30
3.8.3	Engine failure at or above V1	3-30
3.9	System failures	3-31
3.10	Guidance for diversion in case of serious technical failure	3-32
3.10.1	General	3-32
3.10.2	Secondary considerations	3-32
3.10.3	Post landing procedures	3-32
3.11	Ground proximity warning	3-33
3.12	TCAS warning	3-34

3.13	Windshear	3-34
3.14	Severe turbulence and/or gust encounter	3-34
3.15	Emergency landing & ditching	3-34
3.16	Departure contingency procedures	3-35
4	**SECTION 4 - PERFORMANCE**	4-1
4.1	General	4-1
4.2	Use of APG runway analysis	4-1
4.3	Additional performance data	4-3
5	**SECTION 5 - FLIGHT PLANNING**	5-1
5.1	Flight planning	5-1
5.2	Fuel policy	5-2
6	**SECTION 6 - MASS AND BALANCE**	6-1
6.1	General	6-1
6.2	Aircraft specific mass and balance values	6-2
6.2.1	General	6-2
6.2.2	Determination of dry operating mass	6-3
6.3	FMS weight and balance	6-4
7	**SECTION 7 - LOADING**	7-1
7.1	General	7-1
7.2	Procedures for loading specific aircraft configurations	7-1
8	**SECTION 8 - CONFIGURATION DEVIATION LIST**	8-1
9	**SECTION 9 - MINIMUM EQUIPMENT LIST**	9-1
10	**SECTION 10 - SURVIVAL AND EMERGENCY EQUIPMENT INCLUDING OXYGEN**	10-1
10.1	Emergency and safety equipment	10-1
10.1.1	General	10-1
10.1.2	Emergency locater transmitter	10-5
10.1.3	Hand fire extinguisher	10-6
10.1.3.1	General	10-6
10.1.3.2	Location	10-6
10.1.3.3	Operation	10-6

10.1.3.4	Pre-flight inspection	10-7
10.1.4	Crash axe	10-8
10.1.4.1	General	10-8
10.1.4.2	Location	10-8
10.1.4.3	Operation	10-8
10.1.4.4	Pre-flight inspection	10-8
10.1.5	First aid kit	10-9
10.1.5.1	Location	10-9
10.1.5.2	Operation	10-9
10.1.5.3	Pre-flight inspection	10-11
10.1.6	Universal precaution kit	10-12
10.1.6.1	General	10-12
10.1.6.2	Location	10-12
10.1.6.3	Operation	10-12
10.1.6.4	Pre-flight inspection	10-13
10.1.7	Supplemental personal protective equipment	10-14
10.1.7.1	General	10-14
10.1.7.2	Location	10-14
10.1.7.3	Operation	10-14
10.1.7.4	Pre-flight inspection	10-19
10.1.8	Flashlight	10-20
10.1.8.1	General	10-20
10.1.8.2	Location	10-20
10.1.8.3	Operation	10-20
10.1.8.4	Pre-flight inspection	10-20
10.1.9	Life jacket cabin (adult / child)	10-21
10.1.9.1	General	10-21
10.1.9.2	Location	10-21
10.1.9.3	Operation	10-21
10.1.9.4	Pre-flight inspection	10-22

10.1.10	Life jacket cabin (infant)	10-23
10.1.10.1	General	10-23
10.1.10.2	Location	10-23
10.1.10.3	Operation	10-23
10.1.10.4	Pre-flight inspection	10-23
10.1.11	Life jacket cockpit	10-24
10.1.11.1	General	10-24
10.1.11.2	Location	10-24
10.1.11.3	Operation	10-24
10.1.11.4	Pre-flight inspection	10-24
10.1.12	Life raft	10-25
10.1.12.1	General	10-25
10.1.12.2	Location	10-25
10.1.12.3	Operation	10-25
10.1.12.4	Pre-flight inspection	10-26
10.1.13	Protective breathing equipment	10-27
10.1.13.1	General	10-27
10.1.13.2	Location	10-27
10.1.13.3	Operation	10-27
10.1.13.4	Pre-flight inspection	10-28
10.1.14	Battery risk management system	10-29
10.1.14.1	General	10-29
10.1.14.2	Location	10-29
10.1.14.3	Operation	10-30
10.1.14.4	Pre-flight inspection	10-30
10.1.15	Smoke goggle	10-31
10.1.15.1	General	10-31
10.1.15.2	Location	10-31
10.1.15.3	Operation	10-31
10.1.15.4	Pre-flight inspection	10-31

10.1.16	Survival equipment	10-32
10.1.16.1	General	10-32
10.1.16.2	Location	10-32
10.1.16.3	Operation	10-32
10.1.16.4	Pre-flight inspection	10-32
10.1.17	Cabin seat belt (adult / child)	10-33
10.1.17.1	General	10-33
10.1.17.2	Location	10-33
10.1.17.3	Operation	10-34
10.1.17.4	Pre-flight inspection	10-34
10.1.18	Cabin seat belt (infant)	10-35
10.1.18.1	General	10-35
10.1.18.2	Location	10-35
10.1.18.3	Operation	10-35
10.1.18.4	Pre-flight inspection	10-35
10.1.19	Cabin oxygen mask	10-36
10.1.20	Cockpit oxygen mask	10-37
10.1.21	Passenger safety briefing card	10-38
10.1.21.1	General	10-38
10.1.21.2	Location	10-38
10.1.21.3	Operation	10-38
10.1.21.4	Pre-flight inspection	10-38
10.2	Amount of oxygen required	10-39
11	**SECTION 11 - EMERGENCY EVACUATION PROCEDURES**	11-1
11.1	Instructions for preparation for an emergency evacuation	11-1
11.1.1	Cockpit preparation	11-1
11.1.2	Emergency landing or ditching briefing	11-2
11.1.3	Able-bodied passenger briefing	11-2
11.1.4	Brace position	11-3
11.1.4.1	Forward-facing seats	11-3

11.1.4.2	Aft-facing seats	11-4
11.1.4.3	Side-facing seats	11-5
11.1.4.4	Brace position for children	11-6
11.1.4.5	Brace position for lap-held infants	11-6
11.1.4.6	Brace position for pregnant women	11-7
11.2	Emergency evacuation procedures	11-8
11.2.1	Decision to evacuate	11-8
11.2.2	Unplanned or planned emergency landing or ditching	11-8
11.2.2.1	Unplanned emergency landing or ditching	11-8
11.2.2.2	Planned emergency landing or ditching	11-8
11.2.3	ATC call when evacuating	11-8
11.2.4	Evacuation procedure	11-9
12	**SECTION 12 - AIRCRAFT SYSTEMS**	12-1
12.1	General	12-1
A	**ANNEX**	A-1

ADMINISTRATION AND CONTROL

►Refer to the Operations Manual Part A Section I – Administration and control

The Operations Manual (OM) shall contain operational instructions, which are to be complied with by all Company Personnel involved with the ground and/or the flight operations of the Company. All concerned Company Personnel shall be familiarised and remain familiar with its content and shall carry out their duties as described in the OM. If not, they may become subject to actions[1]. Refer to the OM Part A for a more detailed description of the applicable rules and regulations, language and terminology, description of the contents of the OM, distribution system, description of the annotation of pages, definitions, abbreviations, system of revisions and Company Personnel feedback procedures.

Nothing contained in the OM shall however prevent Company Personnel from exercising their own best judgement during any situation for which the OM makes no provisions or in case of an emergency.

In the interest of safety, a Commander (PIC) may deviate from the operational procedures and rules, if the situation he is in is an emergency situation that requires prompt decisions and actions. In the case of any deviation from the operational procedures and/or rules, the Commander (PIC) shall submit an occurrence report (OR).

[1] The Company embraces the just culture policy as described in the Safety Management Manual. The just culture policy does however not apply to the following conditions:

1. Gross negligence on the part of the individuals involved;
2. Criminal intent on the part of the individuals involved;
3. Intentional acts by the individual in the performance of their duties that contravene company policies and procedures or the accepted policies and procedures as set forth by governmental regulation;
4. The wrongful or unlawful consumption of medications, alcohol or controlled substances by the individual making the error;
5. An individual who knowingly fails to report an operational error, obvious hazard or a mandatory reporting item.

SECTION 0 - UNITS OF MEASUREMENT AND GENERAL INFORMATION

0.1 Units and conversions

The following units and conversions shall be applicable when using this manual:

Table: Units and conversions

Units and conversions		
To convert	Into	Multiply by
Meters	Feet	3,28
Feet	Meters	0,304
Yards	Feet	3,00
Inches	Millimeters	25,4
Millimeters	Inches	0,039
Kilometers	Statue Miles	0,62
Kilometers	Nautical Miles	0,54
Statue Miles	Kilometers	1,609
Statue Miles	Nautical Miles	0,869
Nautical Miles	Statue Miles	1,15
Nautical Miles	Kilometers	1,852
Liters	Imperial Gallon	0,219
Liters	US Gallon	0,264
US Gallon	Liters	3,78
US Gallon	Imperial Gallon	0,83
Pounds	Kilogram	0,45
Kilogram	Pounds	2,204

0.2 Aircraft information

► *Refer to the Airplane Flight Manual Section 2 – Limitations: Passenger cabin*

► *Refer to the Operations Manual Part A Section* ***1.1.5 – List of aircraft in service***

This manual shall be applicable for the following aircraft:

Table: Aircraft information

Aircraft information		
Aircraft registration	OO-NEY	PH-LGD
Model	E545 (Legacy 450)	E550 (Legacy 500)
Serial number	55010003	55000011
Manufacturer	Embraer	
Maximum operational passenger seating configuration (MOPSC)	8+1(1)	9+1(1)
Note 1: Number of belted toilet seat installed (certified to carry an occupant during all phases of flight).		

0.3 Aircraft dimensions

The following aircraft dimensions shall be applicable:

Figure: Aircraft dimension – E545

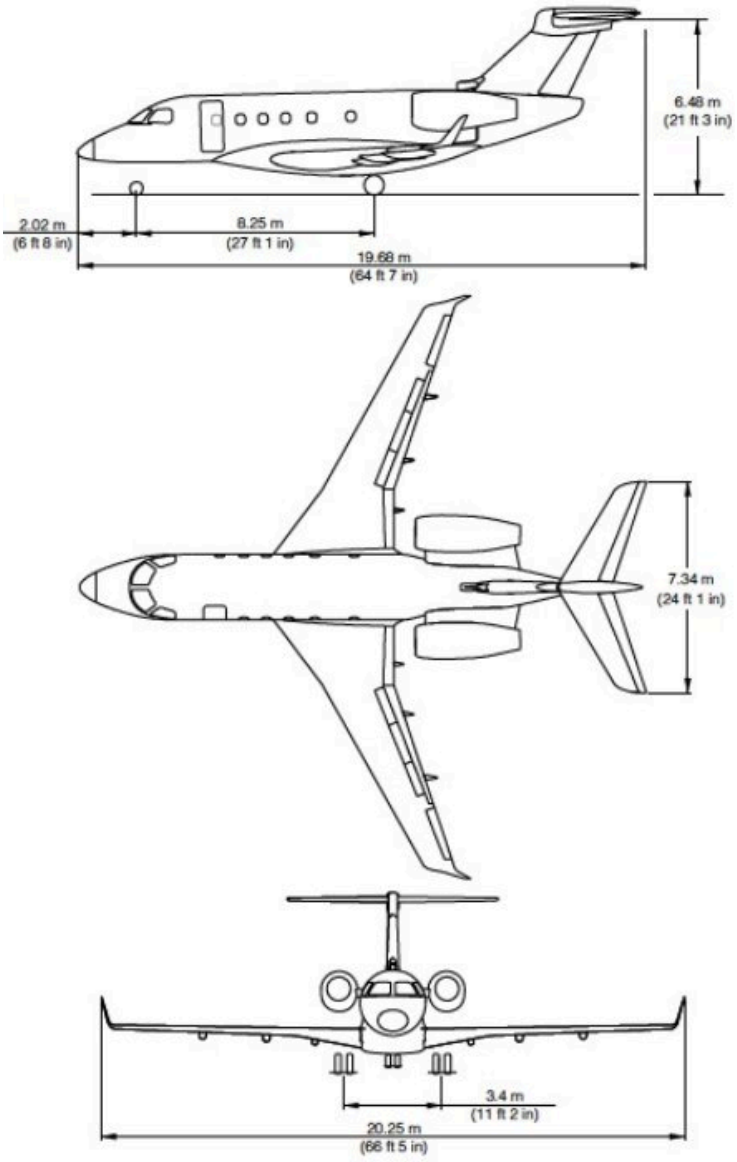
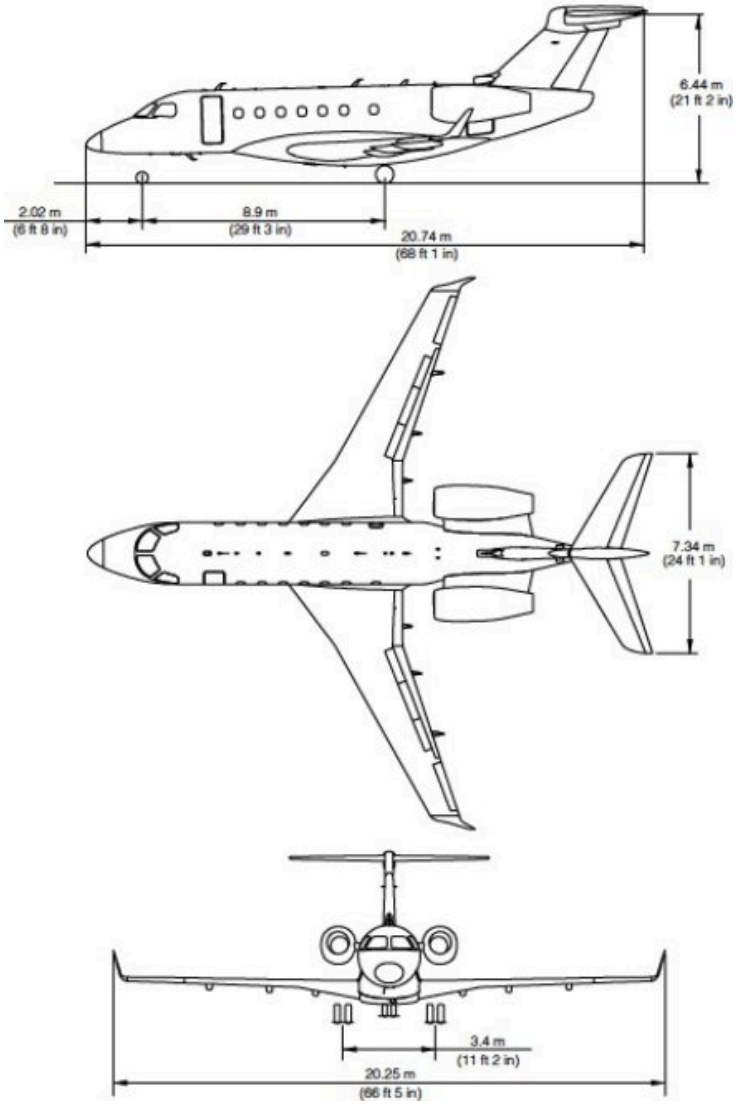


Figure: Aircraft dimension – E550



SECTION 1 - LIMITATIONS

1.1 Certification status

► *Refer to the Airplane Flight Manual Section 2 – Limitations*

This aircraft is certified in accordance with Certification Specifications for Large Aeroplanes CS-25.

WARNING

Certification and operational limitations are conditions of the type and airworthiness certificate and shall be complied with at all times as required by law.

CAUTION

Not all aircraft certification and operational limitations as published in the Airplane Flight Manual (AFM) are included in this manual. As this manual only complements the information as found in the AFM, every Flight Crew Member shall ensure that all certification and operational limitations as published by the aircraft manufacturer are complied with even when not published in this manual.

In case of a conflict in contents between this manual and the applicable AFM or any other legal document published by the aircraft manufacturer, the latter shall prevail.

NOTE

For the EASA certification, please refer to the EASA type-certificate data sheet EASA.IM.A.526 as found on the EASA website ***http://easa.europa.eu****.*

1.2 Seating configuration

► *Refer to the Airplane Flight Manual Section 2 – Limitations: Passenger cabin*

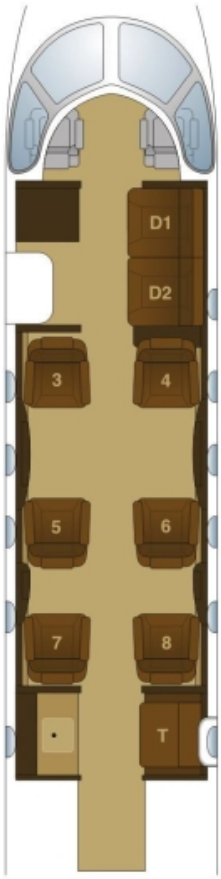
► *Refer to the Airplane Operations Manual Volume 2 Section 7 – Weight and balance*

1.2.1 General

1.2.1.1 Aircraft with registration OO-NEY

The following seating configuration layout shall be applicable when the aircraft with registration OO-NEY is configured to have a maximum operational passenger seating configuration (MOPSC) of 9.

Figure: Seating configuration – Aircraft with registration OO-NEY



All operational flight plans (OFP), unless indicated differently by the Commander (PIC), shall be prepared using the following seating configuration sequence which excludes required Flight Crew Members in the cockpit for the operation of the flight:

Table: Seating configuration sequence – Aircraft with registration OO-NEY

Seating configuration sequence(6) – Aircraft with registration OO-NEY			
Sequence	Seat number (see above)	Arm(2) (m)	PPS designation(1)
1	5(4) + 6(4)	7,25	SEAT 5&6
2	3(4) + 4(4)	5,72	SEAT 3&4
3	7(4) + 8(4)	8,41	SEAT 7&8
4	D1(3+4)	4,19	DIVAN1
5	D2(3+4)	4,87	DIVAN2
6	T(5)	9,53	TOILET

Note 1: The Company flight planning software (PPS) designates this configuration as 'standard'.
Note 2: For taxi, take-off and landing, seatbacks shall be returned to the fully upright position and the seats shall be moved fully backwards and fully outboard, in order to clear the cabin aisle.
Note 3: During taxi, take-off and landing, the divan cannot be occupied by persons with one of the following characteristics:

1. *Under 15 years old;*
2. *With shoulder height shorter than backrest height;*
3. *Holding an infant, even with lap-held belt.*

Note 4: Seat equipped with a 3-point upper torso restraint system type seat belt. The part of the seat belt going across the upper torso is however not manually lockable.
Note 5: The toilet seat is equipped with a 2-point type seat belt and is certified to carry an occupant during all phases of flight.
Note 6: Note that the Manufacturer numbers the cabin seats in its documentation in a different way as done so above. A different seat numbering is selected by the Company to standardize seat numbering with other Company type of aircraft.

1.2.1.2 Aircraft with registration PH-LGD

The following seating configuration layout shall be applicable when the aircraft with registration PH-LGD is configured to have a maximum operational passenger seating configuration (MOPSC) of 10.

Figure: Seating configuration – Aircraft with registration PH-LGD



All operational flight plans (OFP), unless indicated differently by the Commander (PIC), shall be prepared using the following seating configuration sequence which excludes required Flight Crew Members in the cockpit for the operation of the flight:

Table: Seating configuration sequence – Aircraft with registration PH-LGD

Seating configuration sequence(6) – Aircraft with registration PH-LGD			
Sequence	Seat number (see above)	Arm(2) (m)	PPS designation(1)
1	5(4) + 6(4)	7,14	SEAT 5&6
2	3(4) + 4(4)	5,62	SEAT 3&4
3	9(4)	9,47	SEAT 9
4	7(4)	7,94	SEAT 7
5	D1(3+4)	8,11	DIVAN1
6	D2(3+4)	8,80	DIVAN2
7	D3(3+4)	9,49	DIVAN3
8	T(5)	10,59	TOILET

Note 1: The Company flight planning software (PPS) designates this configuration as 'standard'.
Note 2: For taxi, take-off and landing, seatbacks shall be returned to the fully upright position and the seats shall be moved fully backwards and fully outboard, in order to clear the cabin aisle.
Note 3: During taxi, take-off and landing, the divan cannot be occupied by persons with one of the following characteristics:

1. *Under 15 years old;*
2. *With shoulder height shorter than backrest height;*
3. *Holding an infant, even with lap-held belt.*

Note 4: Seat equipped with a 3-point upper torso restraint system type seat belt. The part of the seat belt going across the upper torso is however not manually lockable.
Note 5: The toilet seat is equipped with a 2-point type seat belt and is certified to carry an occupant during all phases of flight.
Note 6: Note that the Manufacturer numbers the cabin seats in its documentation in a different way as done so above. A different seat numbering is selected by the Company to standardize seat numbering with other Company type of aircraft.

1.2.2 Passengers with reduced mobility and special category passengers

CAT.OP.MPA.155 (b), CAT.OP.MPA.155 (b) AMC1, CAT.OP.MPA.155 (c), CAT.OP.MPA.155 (c) AMC1, CAT.OP.MPA.165, CAT.OP.M…

► Refer to the Operations Manual Part A Section **8.2.2.2 – Allocation of seats**

Passengers shall be seated where, in the event of an emergency evacuation, they may best assist and not hinder evacuation.

A passenger who occupies a seat that permit direct access to an emergency exit shall appear to be reasonably fit, strong and able to assist the rapid evacuation of the aircraft in an emergency after an appropriate briefing by the Commander (PIC).

On commercial air transport (CAT) flights, special category passengers (SCP's) shall not be allocated, nor occupy, seats that permit direct access to emergency exits or where their presence could:

1. Impede crew members in their duties;
2. Obstruct access to emergency equipment;
3. Impede the emergency evacuation of the aircraft.

NOTE

'Direct access' means a seat from which a passenger may proceed directly to the exit without entering an aisle or passing around an obstruction.

Passengers who do not appear fit, strong or able to assist with a rapid evacuation or who classify as special category passengers such as described in the Operations Manual Part A shall not be seated on cabin seats as indicated in red below as they may hinder evacuation through one of the emergency exits.

Besides the limitations as depicted above and the figure below, the following limitations shall also be adhered to:

1. The number of SCP's shall not exceed the number of passengers capable of assisting them in case of an emergency;
2. If the SCP travels with an accompanying passenger, the accompanying passenger shall be seated next to the SCP.

NOTE

'Next to' in this context means also a seat, in a club seating configuration, directly forward or aft of the SCP (i.e. face to face).

1.2.2.1 Aircraft with registration OO-NEY

Passengers with reduced mobility or who classify as special category passengers such as described in the Operations Manual Part A shall not be seated on the divan and toilet seat as they may hinder evacuation through one of the emergency exits:

Figure: Prohibited seating positions for unfit passengers or SCP's – Aircraft with registration OO-NEY



1.2.2.2 Aircraft with registration PH-LGD

Passengers with reduced mobility or who classify as special category passengers such as described in the Operations Manual Part A shall not be seated on the toilet seat as they may hinder evacuation through one of the emergency exits:

Figure: Prohibited seating positions for unfit passengers or SCP's – Aircraft with registration PH-LGD



1.2.3 Multiple occupancy of a seat

CAT.OP.MPA.225 (b)

► *Refer to the Airplane Operations Manual Volume 3 Section 9-14 – Oxygen*

► *Refer to the Operations Manual Part A Section **8.2.2.2 – Allocation of seats***

► *Refer to the Operations Manual Part A Section **8.2.2.3 – Infant seating***

► *Refer to the Operations Manual Part B Section **11.1.4.5 – Brace position for lap-held infants***

Multiple occupancy of a cabin seat by one adult and by one child younger than 2 years of age (i.e. infant) is permitted only if the infant is properly secured by a kangaroo belt or other restraint device supplementary to the adults safety belt harness. In such a case and when oxygen dispensing units are required, one unit each shall be available for both the adult and the infant which may require placarding the adjacent seat 'do not use' for making the necessary oxygen dispensing units available.

CAUTION

A passenger carrying an infant shall not be considered as a SCP but also not as a passenger able to assist with a rapid evacuation in case of emergency as described in the section above hence not allowing him to occupy the seats as indicated in red above.

NOTE

The preferential seat allocation for a passenger carrying an infant, shall be the aft facing seats taking the best brace position for them into account.

1.2.4 Passengers travelling with a pet of more than 8 kg in the cabin

► *Refer to the Operations Manual Part A Section 8.2.2.7.4 – Live Animals – Pets*

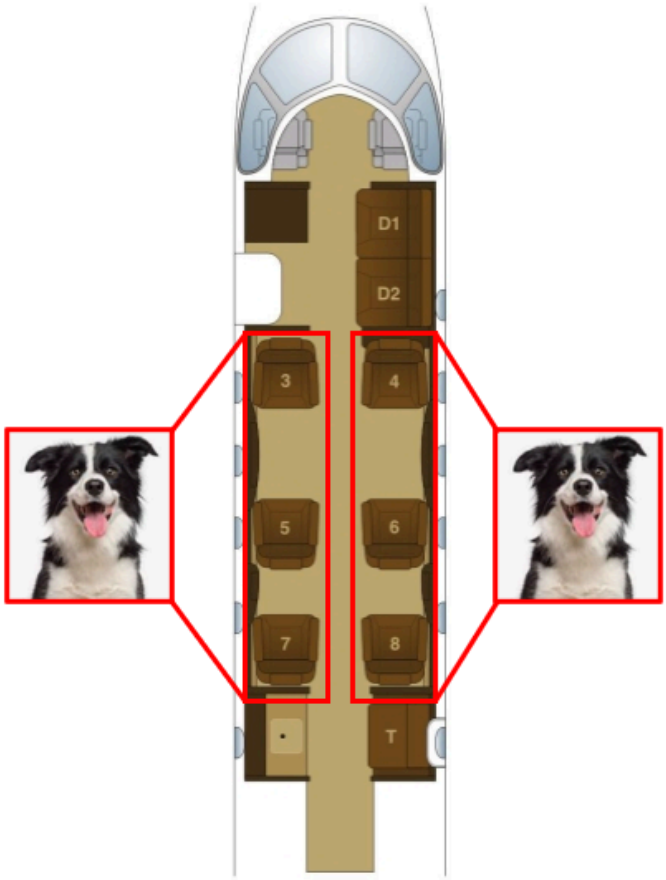
► *Refer to the Operations Manual Part A Section 8.2.2.7.5 – Live Animals – Assistance dogs*

1.2.4.1 Aircraft with registration OO-NEY

Animals shall only be seated on passenger compartment seats or on the floor area as indicated by the square red box in the picture below as they may otherwise hinder evacuation through one of the emergency exits. If the animal is to be seated on the floor space between Seat positions 3 and 5 or 4 and 6, neither of those seats shall be used by a passenger.

The animal shall wear a harness and is to be leashed to the seat belt during all phases of the flight.

Figure: Seating positions for animals with a mass above 8 kg in the passenger compartment of the OO-NEY

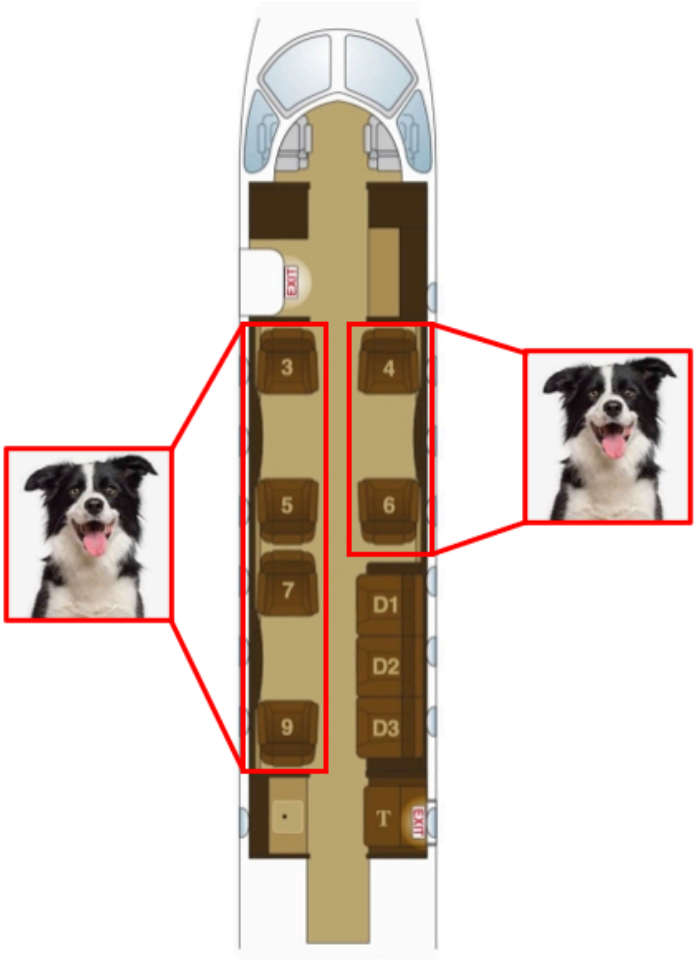


1.2.4.2 Aircraft with registration PH-LGD

Animals shall only be seated on passenger compartment seats or on the floor area as indicated by the square red box in the picture below as they may otherwise hinder evacuation through one of the emergency exits. If the animal is to be seated on the floor space between Seat positions 3 and 5, 4 and 6 or 7 and 9, neither of those seats shall be used by a passenger.

The animal shall wear a harness and is to be leashed to the seat belt during all phases of the flight.

Figure: Seating positions for animals with a mass above 8 kg in the passenger compartment of the PH-LGD



1.3 Kinds of operation

► *Refer to the Airplane Flight Manual Section 2 – Limitations*

► *Refer to the Minimum Equipment List (MEL)*

The aircraft shall be approved for the following kinds of operation when the required equipment, as shown in the Minimum Equipment List (MEL), is installed and operable:

1. VFR day,
2. VFR night,
3. IFR day,
4. IFR night,
5. Flights into (known) icing conditions.

1.4 Types of operation

► *Refer to the Operations Manual Part A Section **1.1.5 – List of aircraft in service***

The aircraft shall be approved for the following types of operation:

Table: Operations specifications

Operations specifications(1)	
Type of operation	Commercial air transportation (CAT) operation and non-commercial operation with complex motor-powered aircraft (NCC) by AOC
Area of operation	Worldwide
Transport of dangerous goods	Not authorised
Take-off minima	RVR 125 m(2)
Landing minima	CAT I(4)
RVSM	Worldwide
ETOPS	Not authorised(3)
Oceanic / remote (RNAV 10)(5)	Authorised
Oceanic / remote (RNP 4)(6)	Not authorised
RNAV 5 (B-RNAV)	Authorised
RNAV 2(7)	Not authorised
RNAV 1 (P-RNAV)	Authorised
RNP 1	Authorised
RNP APCH operations	LNAV - LNAV/VNAV - LPV(9)
RNP AR APCH operations(8)	Not authorised
NAT HLA MNPS operations	Authorised(13)
Operations in areas of metric altimetry	Authorised
Steep approach operations	Authorised
Reduced required landing distance operations	Not authorised
CPDLC operations	ATN B1

Operations specifications[1]	
Transponder capabilities	Mode S with enhanced surveillance (EHS) and ADS-B OUT functionality
Performance-based communication and surveillance (PBCS)[12]	Not authorised
Use of electronic flight bag (EFB) system	Authorised (full approval)[10]
ATC flight plan suffixes[11]	
Item 10a suffixes	SDE2E3FGHIJ1RWXYM3B
Item 10b suffixes	LB1
Item 18 PBN suffixes	PBN/A1B1D2D3O2S2

Operations specifications(1)
Note 1: In case of a conflict in contents between this table and the Company air operator certificate (AOC) or any other legal document published by the Belgian CAA, the latter shall prevail. *Note 2: A take-off shall only be performed with an RVR no less than 125 meters. If one or both Flight Crew Members is / are not trained accordingly for low visibility take-off procedures, the RVR shall not be less than 400 meters. If both Flight Crew Members are trained accordingly for low visibility take-off procedures but for a different LVTO RVR, the highest of both RVR's shall be applicable as minimum RVR.* *Note 3: Refer to the Operations Manual Part B Section **2.20 - ETOPS operation** for a detailed description of the applicable limitations.* *Note 4: RVR not less than 550 meters and DH not lower than 200 ft.* *Note 5: Designated and authorised as RNP 10.* *Note 6: RNP 4 is the oceanic / remote navigation specification to support 30 NM track spacing (instead of 50 NM track spacing for RNAV 10) with ADS-C and CPDLC FANS 1/A required.* *Note 7: This is a non-European en-route standard. Guidance for this RNP standard is provided in ICAO Doc 9613.* *Note 8: Each RNP AR approach requires a special approval.* *Note 9: RNP APCH operations (i.e. RNAV(GNSS or GPS)) down to LNAV (i.e. NPA GNSS or GPS), LNAV/VNAV (i.e. APV Baro) and LPV (i.e. SBAS APV and SBAS CAT I) minima shall be authorised. Approaches depicted as 'GLS' and 'RNAV(RNP)' to a certain runway shall not be authorised.* *Note 10: Refer to Section **2.1.4.1 – Documents to be carried on each flight** of the OM Part A for the electronic instead of paper documents allowed to be carried under the full EFB approval (i.e. EFB authorised). At all times, electronic documents may be replaced by paper documents (i.e. conventional procedure) if more convenient or in case of an EFB (partial) failure (refer to the applicable MEL).* *Note 11: Based on the above operations specifications, the below ATC flight plan field 10 and 18 suffixes have been established.* *Note 12: The performance-based communication and surveillance (PBCS) concept provides objective operational criteria to evaluate different and emerging communication and surveillance technologies, intended for evolving air traffic management (ATM) operations. The PBCS concept is aligned with that of performance-based navigation (PBN). While the PBN concept applies required navigation performance (RNP) and area navigation (RNAV) specifications to the navigation element, the PBCS concept applies required communication performance (RCP) and required surveillance performance (RSP) specifications to communication and surveillance elements, respectively.* *Note 13: Operating restrictions shall apply within the NAT HLA MNPS airspace, as the aircraft is not authorised to perform RNP 4 operations. Refer to section **8.3.2.3 – NAT HLA MNPS procedures** of the OM Part A for more details.* *Note 14: FANS 1/A+ is an advanced protocol of FANS 1/A which includes a message latency monitoring.*

1.5 Crew composition

► *Refer to the Airplane Flight Manual Section 2 – Limitations: Minimum crew*

► *Refer to the Operations Manual Part A Section* ***1.4 – Authority, duties and responsibilities of a Flight Crew Member***

► *Refer to the Operations Manual Part A Section* ***4.1.4 – Minimum crew requirement and flight duty planned***

► *Refer to the Operations Manual Part A Section* ***4.2 – Designation of the Commander (PIC)***

►*Refer to the Operations Manual Part B Section* ***2.1.3 – Crew resource management procedures***

The minimum flight crew for any type of operation shall be two qualified Flight Crew Members, no single-pilot operations shall be allowed. The aircraft shall be operated without any Cabin Crew Member(s).

1.6 Mass and balance limitation

► *Refer to the Airplane Flight Manual Section 2 – Limitations: Weight limitations*

► *Refer to the Airplane Flight Manual Section 7 – Weight and balance*

► *Refer to the Operations Manual Part B Section **6.1 – General***

1.6.1 Aircraft mass and balance design limitations

The aircraft shall be operated within the following mass and balance design limitations:

Table: Aircraft mass and balance design limitations

Aircraft mass and balance design limitations		
Aircraft model	E545	E550
Maximum design ramp mass	16.280 kg	17.480 kg
Maximum design take-off mass	16.220 kg	17.400 kg
Maximum design landing mass	14.750 kg	15.660 kg
Maximum design zero fuel mass	11.750 kg	12.020 kg

The take-off mass shall be limited by the most restrictive of the following requirements:

1. Maximum certified take-off mass as indicated above;
2. Maximum take-off weight as calculated using the simplified take-off analysis tables or using the optimized performance analyser software (OPERA) and as limited by runway length, altitude, temperature, tire speed, brake energy, climb requirements and obstacle clearance;
3. Maximum take-off weight, as limited by en-route, and landing operating requirements.

The landing mass shall be limited by the most restrictive of the following requirements:

1. Maximum certified landing mass as indicated above;
2. Maximum approach and landing weight as calculated using the landing tables or using the optimized performance analyser software (OPERA) and as limited by runway length, altitude, temperature, tire speed, brake energy, approach climb, and landing climb requirements.

1.6.2 Baggage and storage limitations

The aircraft model E545 shall be operated within the following baggage and storage mass and balance limitations:

Table: Baggage and storage mass and balance limitations – E545

Baggage and storage mass and balance limitations – E545			
Area	PPS designation	Arm (m)	Maximum mass (kg)
Stowage compartment	CABIN	10,44	150
Cargo compartment	CARGO	12,74	400

The aircraft model E550 shall be operated within the following baggage and storage mass and balance limitations:

Table: Baggage and storage mass and balance limitations – E550

Baggage and storage mass and balance limitations – E550			
Area	PPS designation	Arm (m)	Maximum mass (kg)
Stowage compartment	CABIN	11,50	150
Cargo compartment	CARGO	13,80	400

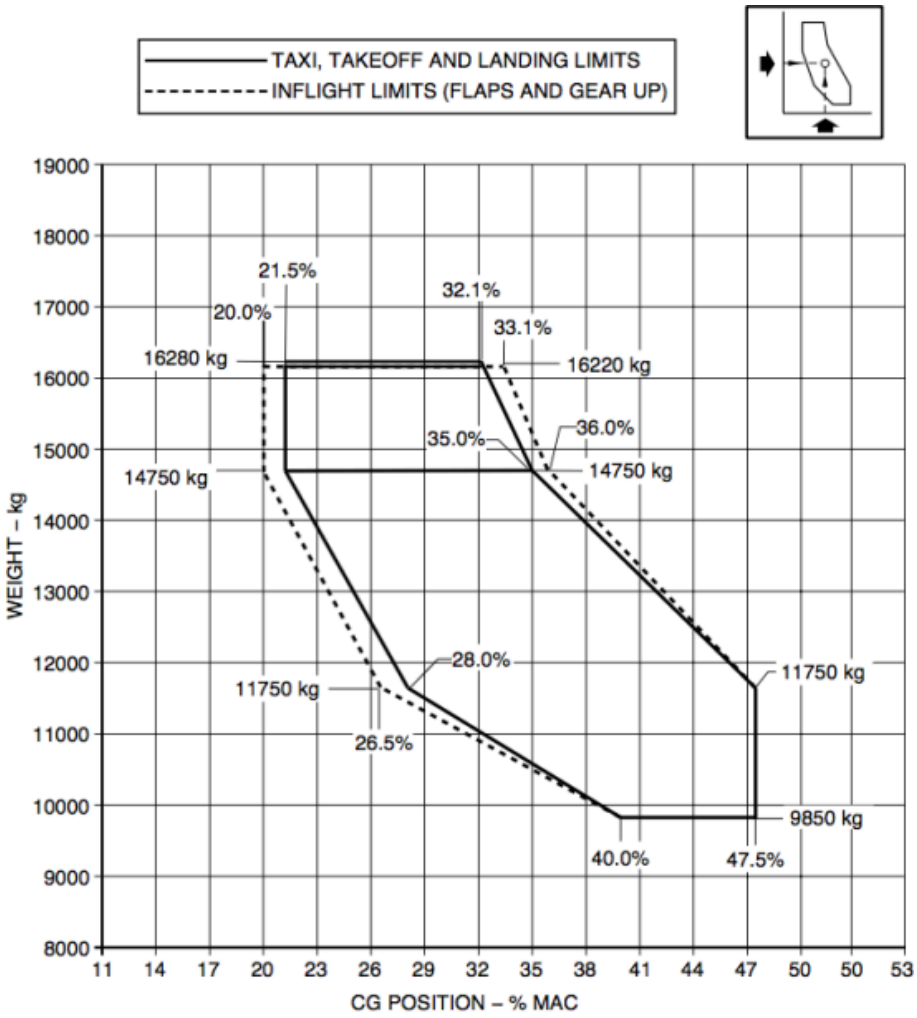
1.7 Center of gravity limitation

CAT.POL.MAB.100 (a) AMC1

► *Refer to the Airplane Flight Manual Section 2 – Limitations: Center of gravity envelope*

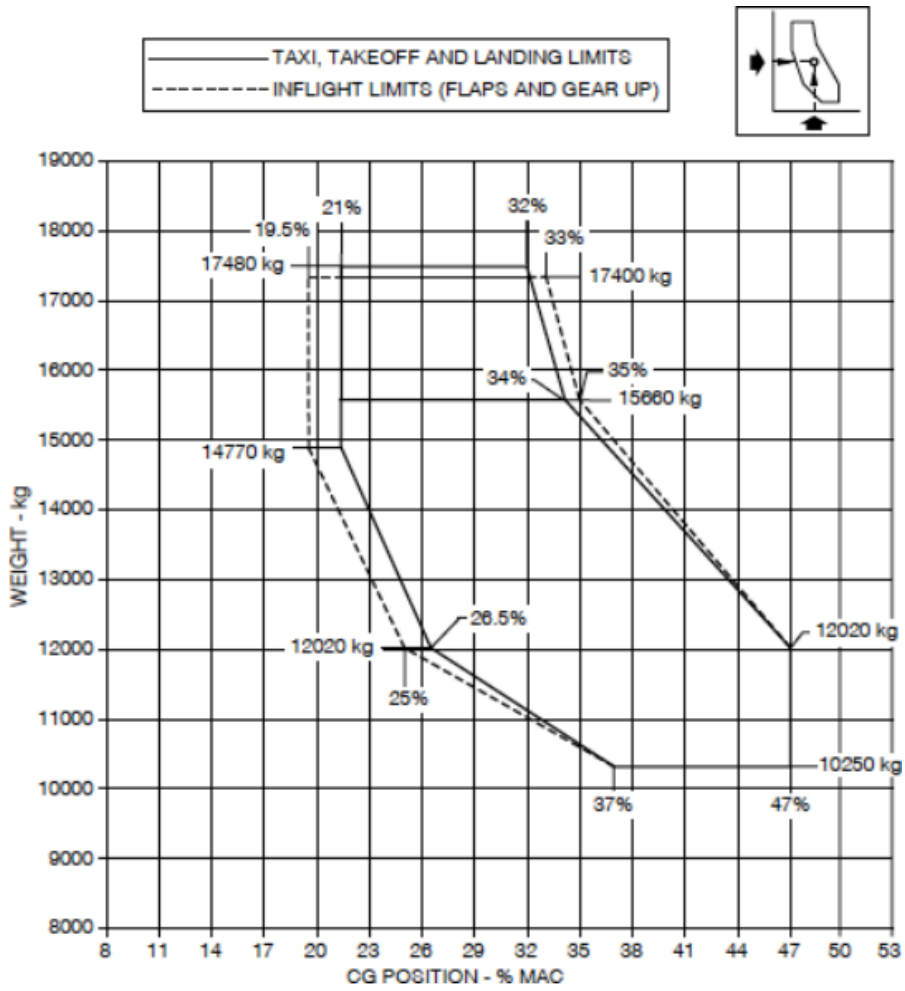
The aircraft model E545 shall be operated with the following center of gravity limitations:

Figure: Center of gravity limitations – E545



The aircraft model E550 shall be operated with the following center of gravity limitations:

Figure: Center of gravity limitations – E550



1.8 Speed limitation

► *Refer to the Airplane Flight Manual Section 2 – Limitations: Airspeeds*

The aircraft shall be operated with the following speed limitations:

Table: Speed limitations

Speed limitations	
V_{MO} (Between sea level and 10.000 ft)	300 KIAS
V_{MO} (Between 10.000 Ft and 30.000 ft)	320 KIAS
M_{MO} (Above 30.000 ft)	0.83 Mach (indicated)
Maximum operating maneuvering speeds (V_A)	Refer to the AFM 2-10
Maximum flap extended speed (V_{FE}) flaps 1	210 KIAS
V_{FE} flaps 2 or 3	185 KIAS
V_{FE} flaps FULL	170 KIAS
Maximum landing gear extended speed (V_{LE})	250 KIAS
Maximum landing gear operating speed (V_{LO})	250 KIAS
Maximum tire ground speed	182 Kts
Recommended speed for holding in icing conditions	200 KIAS
Maximum recommended turbulent air penetration speed (below 10.000 ft)	230 KIAS
Maximum recommended turbulent air penetration speed (above 10.000 ft)	265 KIAS / 0,77 M
Mach minimum control speeds	0,40 to 0,67 Refer to the AFM 2-10

The following limitations shall also be taken into consideration:

1. The maximum operating limit speeds may not be deliberately exceeded in any phase of flight (climb, cruise or descent) unless a higher speed is authorised for flight test or pilot training;
2. Manoeuvres that involve angle of attack near the stall or full application of rudder, elevator, and aileron controls should be confined to speeds below V_A. In addition, the manoeuvring flight load factor limits should not be exceeded;
3. The minimum control speeds are obtained through the optimized performance analyser software (OPERA) outputs as a function of altitude, temperature, weight and flaps.

1.9 Flight envelope limitation

► *Refer to the Airplane Flight Manual Section 2 – Limitations: Operational envelope*

► *Refer to the Airplane Flight Manual Section 2 – Limitations: Operations authorised*

1.9.1 Take-off and landing operational limitations

The aircraft shall be operated with the following take-off and landing operational limitations:

Table: Take-off and landing operational limitations

Take-off and landing operational limitations	
Maximum aerodrome altitude limit	13.800 ft
Minimum / maximum ambient temperature	Refer to the AFM 2-10

The following limitations shall also be taken into consideration:

1. The autopilot and yaw damper shall be off for take-off and landing;
2. During taxi, take-off and landing, cabin interior doors must be secured in the open position;
3. Take-off and landings are limited to paved runway surfaces;
4. When planning to land with autothrottle engaged:
    a. Add 5 KIAS to V_{ref};
    b. Multiply the associated flaps unfactored landing distance by 1.1.

1.9.2 En-route operational limitations

The aircraft shall be operated with the following en-route operational limitations:

Table: En-route operational limitations

En-route operational limitations	
Maximum operating altitude	45.000 ft
Minimum / maximum ambient temperature	Refer to the AFM 2-10
Maximum altitude with flaps extended	20.000 ft

1.10 Wind limits

► *Refer to the Airplane Flight Manual Section 2 – Limitations*

► *Refer to the Operations Manual Part A Section* ***8.1.3.12 – Crosswind operations***

► *Refer to the Operations Manual Part A Section* ***8.2.5 – Safe aircraft parking***

The aircraft shall be operated with the following wind limitations:

Table: Wind limitations

Wind limitations (including gusts)	
Maximum take-off and landing tailwind component	10 Kts
Maximum crosswind component for take-off and landing	25 Kts

Maximum operating crosswind for different kinds of runway contamination (including gusts)	
Contaminated	20 Kts
Compacted snow	20 Kts
Wet ice	15 Kts

NOTE:

During landing with crosswind, brakes must be applied as soon as nose landing gear touchdown.

1.11 Performance limitations for applicable configurations

► *Refer to the Airplane Flight Manual Section 2 – Limitations: Manoeuvring flight load factors*

The aircraft shall be operated with the following load factors:

Table: Load factors

Load factors	
Flaps up (0°)	-1,0 to + 2,5 G
Flap down (1, 2, 3 AND FULL)	0,0 to + 2,0 G
Note: These corresponding accelerations limit the bank angle during turns and limit the pull- up manoeuvres.	

1.12 Runway slope

► *Refer to the Aircraft Flight Manual Section 4 – Performance*

Aircraft Flight Manual performance data is available for runway slopes from uphill gradients of 2% till downhill gradients of -2%.

1.13 Limitations on wet or contaminated runways

► *Refer to the Airplane Flight Manual Section 5 – Performance*

► *Refer to the Operations Manual Part B Section* ***2.23 – Cold weather operation***

Operation on runways contaminated with water, slush, snow or ice implies uncertainties with regard to runway friction and contaminant drag and therefore to the achievable performance and control of the aircraft during take-off, since the actual conditions may not completely match the assumptions on which the performance information is based.

In the case of a contaminated runway, the first option for the Commander (PIC) is to wait until the runway is cleared. If this is impracticable, he may consider a take-off, provided that he has applied the applicable performance adjustments and any further safety measures he considers justified under the prevailing conditions.

Flight Crew Members shall maintain an adequate overall level of safety whilst such operations are limited to rare occasions and all additional measures ensuring an equivalent level of safety shall be ensured. Such measures are special crew training, additional distance factoring and more restrictive wind limitations.

1.14 Airframe contamination

CAT.OP.MPA.255 (a), CAT.OP.MPA.255 AMC1

► *Refer to the Airplane Flight Manual Section 2 – Limitations: Operations in icing conditions*

► *Refer to the Airplane Flight Manual Section 3 – Normal Procedures – Operation in icing conditions*

► *Refer to the Operations Manual Part A Section **8.2.4 – De-icing and anti-icing on the ground***

► *Refer to the Operations Manual Part A Section **8.3.8.3 – Icing conditions in flight***

► *Refer to the Operations Manual Part B Section **2.23 – Cold weather operation***

1.14.1 Ice and rain protection

In icing conditions, the airplane ice protection systems must be used as described in the operating procedures section of this manual. Where specific operational speeds and performance information have been established for such conditions, this information must be used.

Icing conditions may exist whenever the Outside Air Temperature (OAT) on the ground or for takeoff, or Total Air Temperature (TAT) in flight, is 10°C or below and visible moisture in any form is presented (such as clouds, fog with visibility of one mile or less, rain, snow, sleet and ice crystals).

NOTE

Take-off is prohibited with frost (polished or not), ice, snow or slush adhering to wings, control surfaces, engine inlets, or other critical surfaces.

Notwithstanding ice detector monitoring, the crew remains responsible for monitoring icing conditions and for manual activation of the ice protection system if icing conditions are present and the ice detection system is not activating the ice protection system.

1.14.2 Operations in severe icing conditions

CAT.OP.MPA.255 (c)

Severe icing may result from environmental conditions outside of those for which the aircraft is certified. Flight in freezing rain, freezing drizzle or mixed icing conditions (supercooled liquid water and ice crystals) may result in ice build-up on protected surfaces exceeding the capability of the ice protection system or may result in ice forming aft of the protected surfaces. This ice may not be shed when using the ice protection systems and may seriously degrade the performance and controllability of the aircraft.

During flight, severe icing conditions shall be determined by the following visual cues:

1. Unusually extensive ice accumulation on the airframe and windshield in areas not normally observed to collect ice;
2. Accumulation of ice on the upper surface of the wing aft of the protected area extending more than 12 to 18 inches aft of the heated leading edge.

If one or more of the above visual cues exist:

1. Use of the autopilot is prohibited;
2. Immediately request priority handling from Air Traffic Control to facilitate a route or altitude change to exit the icing conditions;
3. Leave flaps in current position, do not extend or retract;
4. Avoid abrupt and excessive maneuvering that may exacerbate control difficulties;
5. If unusual or uncommanded roll control movement is observed, reduce angle-of attack.

The wing icing inspection light shall be operative prior to flight into known or forecast icing conditions at night.

NOTE

This supersedes any relief possibly provided by the Minimum Equipment List.

1.15 System limitations

► *Refer to the Airplane Flight Manual Section 2 – Limitations*

► *Refer to the Airplane Operations Manual Volume 3 – System description*

► *Refer to the Operations Manual Part B Section **12 - Aircraft systems***

Some systems and/or equipment may require some more detailed explanation (e.g. specific and/or additional limitations for a certain system and/or equipment); hence they shall be detailed below if so required.

NOTE

Currently no such systems and/or equipment require such more detailed additional limitations.

SECTION 2 - NORMAL PROCEDURES

2.1 General procedures

2.1.1 Introduction

ORO.MLR.100 AMC1 (e), ORO.MLR.100 AMC1 (f)

The standard operating procedures (SOP) as described in section 2 and 3 of this manual are based on the different manufacturer guidelines, on the FlightSafety Foundation recommendations and some common practices in the industry. They have been adapted to ensure standardisation among different aircraft fleets operated within the Company. However, where standardisation was not feasible, differences between different fleets remain and are marked in the different Operations Manuals Part B.

The SOP's shall be supplemented by information about specific operating techniques and recommendations for specific types of operations (contaminated runways, RVSM, etc). The SOP's assume that all aircraft systems are operating normally and that all automation is used normally. Conditions may arise, where the application of the Company SOP's are not the best course of action. Only after due consideration, and agreement of both Flight Crew Members, a deviation from Company SOP's may be permitted.

In case a discrepancy or contradiction arises between the procedures described in this manual and the Aircraft Flight Manual (AFM), the Aircraft Flight Manual shall be considered as legal authority.

2.1.2 Manufacturer standard operating procedures

► *Refer to the Standard Operating Procedures Manual*

The manufacturer has published a Standard Operating Procedures (SOP) Manual, which serves as a guideline for the implementation of safe and efficient operational procedures for E545 / E550 aircraft.

Flight Crew Members shall adhere to the standard operating procedures (SOP's), which have been described in this SOP Manual. As this manual does not take into account Company specific procedures and as it is not a substitute for any of the Company Operations Manuals required by the applicable regulations, the procedures described in the SOP Manual shall be supplemented with the Company specific procedures described in this manual.

If a subsection in this manual only refers to the SOP Manual, the SOP Manual procedures shall be considered Company procedures and shall be adhered to. If additional Company procedures are required, these shall be added below the reference to the SOP Manual.

In case a discrepancy or contradiction arises between the procedures described in this manual and the SOP Manual, this manual shall be considered as legal authority. However, in case a discrepancy or contradiction arises between the limitations described in this manual and the Aircraft Flight Manual (AFM), the AFM shall be considered as the legal authority.

Parts of the SOP Manual (e.g. parts of the 'procedures and technique section') where this manual does not refer to specifically are to be considered guidelines and/or useful information.

2.1.3 Crew resource management procedures

► *Refer to the Standard Operating Procedures Manual Section 3-05 – Areas of responsibility and team mentality*

► *Refer to the Operations Manual Part A Section* ***1.4 – Authority, duties and responsibilities of a Flight Crew Member***

► *Refer to the Operations Manual Part A Section* ***4.2 – Designation of the Commander (PIC)***

► *Refer to the Operations Manual Part B Section* ***1.5 – Crew composition***

The aircraft shall be operated using the Pilot Flying (PF) and Pilot Monitoring (PM) concept (i.e. multi-pilot operations). Each of both Flight Crew Members shall always advise the other Flight Crew Member if he is intending to operate something in the cockpit, so the other Flight Crew Member maintains situational awareness at all times. Duties are also assigned according to the mission phase. Pre- and post-flight duties are shared between the Pilot-in-Command (Commander) and the other Flight Crew Member (SIC), while in-flight phases are shared between the Pilot Flying (PF) and the Pilot Monitoring (PM).

The Pilot Flying (PF) shall be responsible for controlling the throttles (energy management), flight path, aircraft configuration and the navigation by either supervising the autopilot or by hand flying the aircraft with or without flight director.

The Pilot Monitoring (PM) shall be responsible for monitoring and supporting tasks. These include communications with ATC, SOP actions, flight director and flight management systems (FMS) mode selections and target entries when the PF is hand flying the aircraft, monitoring systems and aircraft configuration and cross checking the PF to provide back-up.

The Commander (PIC) shall be assigned by the Flight Operations Manager. He maintains overall responsibility for the safe and efficient conduct of the flight. The Commander (PIC) of the flight will assign the PF and PM duties for each sector. He will allocate duties, taking into account the experience level of both Flight Crew Members, the level of complexity of the planned flight, weather, etc.

The Flight Crew Member in the left seat shall be referred to as CM1, the Flight Crew Member in the right seat as CM2. In most cases, the Flight Crew Member in the left seat (CM1) shall be the Commander (PIC) of the flight. During training or operations with two Captains, the Commander (PIC) may be in the right seat and this only when he is qualified to do so.

2.1.4 Sterile cockpit concept

CAT.OP.MPA.215, ORO.GEN.110 (f), ORO.GEN.110 (f) AMC1

► *Refer to the Standard Operating Procedures Manual Section 3-05 – Dark and quiet cockpit concept*

► *Refer to the Operations Manual Part A Section **8.3.10 – Flight Crew Members at their stations***

► *Refer to the Operations Manual Part A Section **8.3.14 – Use of headset***

► *Refer to the Operations Manual Part B Section **2.1.16 – Clean cockpit concept***

Flight Crew Member's distraction has been a contributing factor in some aviation accidents. During critical phases of flight, Flight Crew Members shall be focused on flight path monitoring, ATC communication, terrain awareness and aircraft configuration. The sterile cockpit procedure shall be applied:

1. During critical phases of flight including pushback and taxiing of the aircraft;
2. When starting and shutting down the engines and all related tasks to it including performing checklists (i.e. before start checklist and shutdown checklist);
3. When performing checklists;
4. Below 10.000 ft above the aerodrome of departure after take-off and the aerodrome of destination before landing, except for cruise flight;
5. When the autopilot is not engaged;
6. During any other phases of flight as determined by the Commander (PIC).

During the sterile cockpit procedure, the following shall be applicable:

1. A Flight Crew Member shall be restricted to essential operational activities and shall not engage in non-operational communication with each other or with the Passenger(s);
2. Both Flight Crew Members shall be seated at their assigned station with their seat belt and shoulder harness properly fastened. Seats and rudder pedals shall be properly adjusted by both Flight Crew Members in order to allow, if necessary, for full control including full rudder deflection and maximum braking;
3. Both Flight Crew Members shall not handle any portable electronic device (PED) which is not properly secured. When so properly secured, handling shall be limited to essential operational activities only;
4. The Pilot Flying (PF) shall, in case the autopilot is engaged, keep his hands free so he can immediately intervene, if necessary, without any delay;
5. Passengers shall, if deemed necessary by the Commander (PIC), be briefed on the sterile cockpit concept as to minimize distraction of the crew and/or access of the passengers to the cockpit;
6. The clean cockpit concept shall be applied;
7. Headsets shall be used.

NOTE

Flight Crew Members shall also not engage in non-operational communication with Passengers during the last 1.000 ft before reaching the assigned level.

2.1.5 Manufacturer and Company checklists

CAT.GEN.MPA.105 (a) (8), ORO.GEN.110 (h)

2.1.5.1 Use of normal checklists

► *Refer to the Manufacturer Quick Reference Handbook QRH-3924-610 Section NPO (Legacy 450) – Normal procedures*

► *Refer to the Manufacturer Quick Reference Handbook QRH-3924-310 Section NPO (Legacy 500) – Normal procedures*

► *Refer to the Operations Manual Part B Section **2.26 - Specific system and/or equipment additional normal procedures***

2.1.5.1.1 General

► *Refer to the Standard Operating Procedures Manual Section 3-05 – Checklist philosophy*

► *Refer to the Standard Operating Procedures Manual Section 3-05 – Electronic checklist*

Flight Crew Members shall use the electronic checklist (ECL) or the Manufacturer Quick Reference Handbook (QRH) during normal operations. If required, more expanded procedures may be found in the Airplane Operations Manual (AOM).

NOTE

In case a discrepancy or contradiction arises between the procedures described in the ECL and the QRH, the QRH shall be used.

There are two types of normal checklists:

1. **A read and do checklist** being a checklist where the Flight Crew Member reads out loud the item from the checklist, accomplishes or verifies its status and calls out the verified status of the item. An abnormal or emergency checklist shall be performed on the basis of read and do;
2. **A challenge and response checklist** being a checklist where the Flight Crew Member reading the checklist reads the item, both Flight Crew Members check the status of the item and the challenged Flight Crew Member responds with the status of the verified item. A normal checklist shall be performed on the basis of challenge and response.

To enhance communication and understanding between Flight Crew Members when performing a challenge and response checklist, the following standard rules and phraseology shall be used at all times:

1. The responding Flight Crew Member shall respond to the challenge only after having checked or corrected the required configuration;
2. If noticing that the required configuration is not correct, the responding Flight Crew Member shall announce the actual configuration;
3. In all cases, the challenging Flight Crew Member shall wait for a positive response (and shall cross-check the validity of the response, as required) before moving to the next item.

In case of a read and do checklist, the PM shall read out loud the checklist and the status of the item. Performing a read and do checklist is preferably done when the PF is able to listen to the checklist called out at loud so any item and status called by the PM may be monitored by the PF. If the status is not in compliance with the expected checklist item status, the Flight Crew Member who challenges will discontinue reading the checklist to announce and, after coordination with the other Flight Crew Member, take the appropriate corrective action if required. The other Flight Crew Member shall crosscheck this corrective action.

If the PF fails to initiate a normal checklist, the PM shall suggest the initiation of the checklist by applying good CRM practice. Normal checklists shall be called in a timely manner during low-workload periods.

When the response listed in the checklist is ‘as required’, the actual configuration or status of the system shall be announced.

When a checklist is called for, it shall either be completed in full or down to the line when items after the line cannot yet be completed. The Flight Crew Member reading the checklist shall hold the checks at the line if the items after the line cannot be completed.

When engines are running, items shall not be skipped and returned to except where interrupted by ATC or for safety reasons. When a checklist was interrupted, the checklist shall be retaken from the top.

The PM shall always verbalize the completion of the checklist by calling out loudly “(relevant checklist – see below) CHECKLIST COMPLETED”.

When unable to complete a checklist completely due to open items, the PM shall call out loud “(relevant checklist – see below) CHECKLIST COMPLETED EXCEPT FOR (checklist item)”. When these open items have been completed, the PM shall call out loud “(relevant checklist – see below) CHECKLIST NOW COMPLETED”.

CAUTION

As long as a checklist has been started but has not been completed due to open items in that checklist, sterile cockpit procedures shall apply.

CAUTION

If a change in Take-off flap selection is required after having completed the AFTER START checklist and before Take-Off, the checklist sequence and ECL shall be reset to the BEFORE START checklist.

NOTE

Open items are typically at the end of the applicable checklist. The checklist items related to autopilot / yaw damper and landing lights part of the before landing checklist shall not be required to be completed to meet the stable criteria.

When low visibility procedures are in force, any checklist and/or briefing shall be performed stationary, at the apron or at the holding point. No checks shall be done while taxiing to have both Flight Crew Members available for a safe taxi procedure.

The normal checklists called for within the Company on this type of aircraft are:

1. Power up (PF).....Challenge and response
2. Before start (PF).....Challenge and response
3. After start (PF).....Challenge and response
4. Before take-off (PF).....Challenge and response
5. After take-off (PF).....Challenge and response
6. Descent (PF).....Challenge and response
7. Approach (PF).....Challenge and response
8. Before landing (PF).....Challenge and response
9. After landing (PF).....Challenge and response
10. Shutdown (PF).....Challenge and response

2.1.5.1.2 Checklist triggers

Certain actions and/or moments shall trigger the request for a certain checklist.

Table: Checklist triggers

Checklist triggers	
Checklist	Trigger(1)
Before start	Start-up clearance received
After start	Before commencing to taxi with the taxi clearance received (if given)
Before take-off	Take-off briefing completed(2)
After take-off	Climbing to the first assigned flight level with the standard pressure set on all altimeters(3+4)
Descent	Descending towards the arrival aerodrome with aircraft performance calculated and the approach, landing and go-around briefing given(5+6+7+8)
Approach	Descending to the first assigned altitude (height) with the QNH (QFE) set on all altimeters(9)
Before landing	Gear confirmed down by both Flight Crew Members
After landing	At a suitable time after clearing the active runway
Shutdown	Parking brake set and both engines spooled down (10)

Note 1: A more detailed triggering system and/or items to be performed before calling for a certain checklist may sometimes be found in the applicable section of this manual.
Note 2: If the take-off briefing is given before commencing to taxi (e.g. low visibility procedures), the before take-off checklist shall be performed after completing the final take-off review (updated take-off briefing for any subsequent last-minute changes if any) and before entering the active runway.
Note 3: Performing the checklist may be delayed at the discretion of the Commander (PIC) if workload does not allow the checklist to be performed.
Note 4: If the flight is performed at lower levels not climbing to a flight level and/or the first portion of the flight does not include climbing to a flight level, the after take- off shall be performed within 10 minutes after take-off.
Note 5: The descent checklist shall be initiated not later than descending through FL100 / 10.000 ft or passing the initial approach fix (IAF), whichever occurs first.
Note 6: If not all parts of the arrival and approach clearance have been received at the start of the descent; subsequent follow-up descent briefing may be required.
Note 7: If the flight is performed at lower levels not including an arrival and/or a subsequent descent, the descent checklist shall be performed at least 10 minutes before the expected landing time.
Note 8: On short flights (e.g. positioning from EBBR to EBAW) the descent and approach checklist may be combined on the condition that a review of the expected arrival and approach procedure is included in the take-off briefing and all required performance data is calculated before departure.
Note 9: If the flight is performed at lower altitude (height), the approach checklist shall be performed at least before passing the IAF or entering the circuit if performing a visual approach.
Note 10: For passenger comfort, it may be acceptable to only perform the initial part of the shutdown checklist before disembarking the passenger(s) (e.g. batteries remaining on to provide lighting to passenger when disembarking at night). Both Flight Crew Members shall ensure after disembarking the passenger(s) that the shutdown checklist is fully completed.

2.1.5.1.3 Abbreviated Company checklist

As this type of aircraft is equipped with an electronic checklist (ECL), no abbreviated Company checklist is produced. Hence, this section shall not be applicable.

2.1.5.1.4 Supplementary Company checklist

► *Refer to the Operations Manual Part A Annex 20 – Supplementary Company checklist - Generic*

► *Refer to the Operations Manual Part B Annex 1 – Supplementary Company checklist E545 / E550*

The Company provides a supplementary Company checklist as an addition to the existing Company or Manufacturer procedures. The generic part may be found as part of the Operations Manual Part A assisting the crew in repeating some procedures embedded in the manual as more practical procedures to be used during actual operations.

The part of the supplementary Company checklist which is aircraft type specific may be found as part of the applicable Operations Manual Part B and contains procedures not provided by the Manufacturer or where a Manufacturer checklist may need some further elaborating as it may not be meeting the Company requirements / procedures.

NOTE
Normal procedures in this checklist are grouped together based on its use. Emergency and abnormal procedures are depicted alphabetically depicting the emergency procedures first.

2.1.5.2 Location of checklists

The following checklists shall be stored in the cockpit according to the following limitations:

1. At least one **Manufacturer Quick Reference Handbook (QRH)** located in the central pedestal when not in use;
2. Two **Company Quick Reference Handbooks (Company QRH)** of which one is located near (i.e. within reach of the applicable Flight Crew Member) each cockpit seat when not in use. When not in use during non-critical phases of flight, the QRH may temporary be stored between the pedestal and the cockpit seats. When not in use during critical phases of flight, it shall be stored in such a way that it remains in its position during acceleration / deceleration of the aircraft. The Company QRH shall exist out of (and in that order):
    a. A supplementary Company checklist – E545 / E550,
    b. A supplementary Company checklist – Generic.

2.1.6 Use of standard calls

Standard calls shall be used to:

1. Give a command or transfer an information;
2. Acknowledge a command or an information transfer;
3. Give a response or ask a question;
4. Callout a change of indication;
5. Identify a specific event.

When using standard calls, use the following clear phraseology:

1. **“CHECK”**: A command for the other Flight Crew Member to verify an item;
2. **“CHECKED”**: A confirmation from the other Flight Crew Member that an item has been verified;
3. **“CROSS-CHECKED”**: A confirmation that information has been verified at both pilot stations;
4. **“SET”**: A command for the other Flight Crew Member to set a specific value or a response from the other Flight Crew Member confirming the specific value to be set;
5. **“SELECT”**: A command to the other Flight Crew Member to initiate a system mode, configuration or setting;
6. **“SELECTED”**: The response from the other Flight Crew Member confirming the initiation of a system mode, configuration or setting requested;
7. **“ARM”**: A command to the other Flight Crew Member to select a mode which does not become active until certain other conditions are met;
8. **“ARMED”**: A response from the other Flight Crew Member confirming the mode requested;
9. **“INSERT”**: A command for the other Flight Crew Member when referring to FMS programming;
10. **“INSERTED”**: A response from the other Flight Crew Member confirming the FMS programming to be performed as requested;
11. **“ENGAGE”**: A command for the other Flight Crew Member to engage a system or select a mode;
12. **“ENGAGED”**: A response from the other Flight Crew Member confirming the engaging of the system or selection of the mode;
13. **“ON / OFF (following the name of a system)”**: A command to the other Flight Crew Member to select or deselect a system or a response from the other Flight Crew Member confirming the status of the system.

When moving switches, the result shall always be announced and crosschecked by reading it on the applicable annunciation.

The PM shall use the deviation limits as set out below to make a corrective call.

Table: Deviation limits before making a corrective call

Deviation limits before making a corrective call(1)			
Parameter	Phase of flight		Deviation limit
Altitude	Take-off, climb, cruise and descent		+/- 100 ft
	Approach		+100 ft / -0 ft
Speed	Take-off and approach		+10 Kts / -5 Kts
	Climb, cruise and descent		+10 Kts / -10 Kts
Bank	All		30°
Lateral navigation	Take-off, climb, cruise and descent		5° / 1 NM
	Approach	ILS and LOC	1 dot
		VOR	+/- 5°
		RNP(2)	1 dot
		NDB	+/- 10°
Glide slope	Approach		+1 dot / -0 dot
Rate of descent	Approach		1.000 ft/min

Note 1: The speed, to which the deviations are referred to, is the target speed for the phase of flight, as agreed before. If a deviation from these parameters is required, it shall be briefed by the PF.
Note 2: Where SBAS APV and SBAS CAT I (i.e. LPV minima) approaches have an angular lateral performance, NPA GNSS (i.e. LNAV minima) and APV BARO (i.e. LNAV/VNAV minima) approaches have a linear lateral performance with reference to the defined path.

When making a corrective call, use common sense. Allow the PF the time to detect and correct the error or deviation. Corrective calls are mandatory when:

1. Accurate parameter control is essential;
2. The flight is in a critical phase;
3. Parameter deviation has gone unnoticed by the PF.

The PM shall call “CHECK SPEED”, “CHECK ALTITUDE”, “CHECK RATE OF DESCENT”, etc as the case may be. PF shall reply “CORRECTING” and corrects the deviating parameter. If PF does not reply or the corrective action is not observed, the PM shall re-initiate his call. If still no reply or no corrective action is given, the PM shall assume the PF’s incapacitation and take over control.

2.1.7 Normal crew tasks

When flying a procedure, use the principle of ‘next step’ callouts. It will be a recall for the PF and a crosscheck possibility for the PM. The use of next step principle shall be imperative especially in marginal weather operations.

2.1.8 Transferring control of the aircraft

The PF shall transfer controls each time he needs to engage in an activity that will divert his attention from his primary tasks or when the failure of primary flight instruments on his side requires him to do so.

Whatever the automation level, all transfers of control shall result in a swap in task allocation, without any doubt to which Flight Crew Member is actually in control of the aircraft. When transferring control, the PF shall make every effort to ensure that the aircraft is correctly trimmed.

When transferring control on request of the PF, the following practice shall be applied:

Table: Callouts transferring control on request of the PF

Callouts transferring control on request of the PF		
Situation	PF	PM
PF requests transfer of control	Your control	---
PM assumes control	---	My control

When transferring control on request of the PM (for safety reasons when PM is the Commander / PIC), the following practice shall be applied:

Table: Callouts transferring control on request of the PM

Callouts transferring control on request of the PM		
Situation	PF	PM
PM assumes control	---	My control
PF releases the controls	Your control	---

2.1.9 Use of autopilot and autothrottle

► *Refer to the Standard Operating Procedures Manual Section 3-05 – Automatic flight, use of the flight director, use of the autopilot and use of the autothrottle*

► *Refer to the Operations Manual Part A Section* ***8.3.19 – Autopilot and autothrottle***

2.1.9.1 General

Flying the aircraft remains the highest priority of any Flight Crew Member.

The purpose of automation is to aid any Flight Crew Member in performing his function. A Flight Crew Member shall be proficient in operating the aircraft at all levels of automation. He shall be knowledgeable in the selection of the appropriate degree of automation and shall have the skills to move from one level of automation to another.

2.1.9.2 Automation levels

Automation may be defined in 4 levels:

Table: Automation levels

Automation levels	
Level	Description
1	No automation. The aircraft is hand flown with autopilot, flight director and autothrottle disengaged. This level of automation is not flown with the exception of: 1. When situation is too complex for any automation (turning final from circling); 2. When recovering from gross deviations that have been entered due to incorrect automatic flight management; 3. Failure of the autopilot and/or flight director; 4. An issue where safety relies upon such disengagement. Such examples are, but not limited to, unexpected response from automation, windshear recovery, collision avoidance and GPWS terrain warning.
2	The aircraft is hand flown with basic flight director guidance. This is the primary mode used for take-off, initial departure, approach and landing. The autothrottle is not engaged.
3	The autopilot is engaged. The flight director is coupled to raw radio data or basic modes such as heading and/or altitude. The autothrottle may or may not be engaged. If engaged, it shall be in manual speed control mode automatically selecting the thrust necessary to obtain the speed manually selected. This level is appropriate when responding to ATC instructions in a dynamic environment such as in terminal areas.
4	The autopilot and autothrottle are engaged with full use of the available automation coupled to the FMS. All speed commands are generated through the FMS. Under these circumstances, great care shall be taken to maintain situational awareness. This level is not appropriate when significant changes to route or runways have been issued by ATC.

2.1.9.3 Use of touch control steering (TCS)

► *Refer to the Airplane Operations Manual Volume 3 Section 9-03 – Automatic flight: Sidestick controls*

2.1.9.4 Selection of automation

Use of level 3 and level 4 automation during terminal operations, shall be limited to circumstances permitting advance preparation, review of FMS programming and complete crew briefing.

Proper use of automation reduces cockpit workload while improper use will do the opposite, which may lead to serious safety breaches. The selected level of automation at any time shall permit the Flight Crew Members to distribute the workload comfortably and maintain situational awareness.

2.1.9.5 Management of the autopilot and autothrottle

Management of the autopilot and autothrottle is based on whether or not the autopilot is engaged.

Table : Task sharing with autopilot engaged

Task sharing with autopilot engaged	
PF	PM
1. Manages the aircraft's path and energy safely and efficiently; 2. Selects and manages the appropriate automation level including all required inputs; 3. Inserts FMS navigation; 4. Complies with ATC instructions; 5. Calls for required checklists and configuration changes.	1. Monitors the aircraft's path and energy; 2. Monitors that the appropriate automation level is selected; 3. Handles ATC and datalink communications; 4. Reads all required checklists and performs configuration changes when called for; 5. Monitors aircraft systems and completes all required in-flight logs and handles charts and performance data computations.
Note: Programming of the FMS navigation system (action that requires a 'heads down' of the PF for a longer period of time) by the PF, shall not be authorised in a sterile cockpit (at or below FL 100) even with the autopilot engaged. Programming of the FMS navigation system shall be performed at or below FL 100 by the PM and this only after clear instructions by the PF. Inputs in the FMS like, but not limited to, a 'direct to' input or changing a FMS page are not considered as 'heads down' actions.	

Table: Task sharing with autopilot disengaged

Task sharing with autopilot disengaged	
PF	PM
1. Manages the aircraft's path and energy safely and efficiently; 2. Calls for the appropriate automation level including all required inputs; 3. Monitors that the appropriate automation level is selected; 4. Calls for FMS navigation changes; 5. Complies with ATC instructions; 6. Calls for required checklists and configuration changes.	1. Monitors the aircraft's path and energy; 2. Selects and manages the appropriate automation level including all required inputs when called for; 3. Inserts FMS navigation when called for; 4. Handles ATC and datalink communications; 5. Reads all required checklists and performs configuration changes when called for; 6. Monitors aircraft systems and completes all required in-flight logs and handles charts and performance data computations.

2.1.9.6 Flight management annunciator callouts

Flight management annunciator (FMA) indications or changes shall be called out except when:

1. The aircraft is on the ground;
2. A go-around is being performed until after the gear has been selected up.

With the autopilot engaged, the PF shall call the FMA mode changes. When the autopilot is not engaged, the PM shall call the mode changes.

Any flight management annunciation, which is not in accordance with the current phase of flight, shall be called out and this by any Flight Crew Member.

2.1.10 Communications

CAT.OP.MPA.215

► *Refer to the Standard Operating Procedures Manual Section 3-05 – Communications*

2.1.10.1 General

► *Refer to the Operations Manual Part A Section **8.3.14 – Use of headset***

Headsets (including boom microphone) shall be worn by all Flight Crew Members in the flight crew compartment at or below FL100. The use of headsets is at the Commander's (PIC's) discretion at a cruising altitude above FL100.

Due to the location of the antennas, COM 2 should be used for communications with ATC in flight. COM 1 should be used for reception of ATIS, communication with aerodrome information services or fixed base operator (FBO) frequencies and for communications with ATC on ground. When COM 1 is not being used, Flight Crew Members shall listen out on 121,5 MHz. COM 3 shall be used for ACARS and CPDLC.

When HF frequencies are used for communicating with ATC, Flight Crew Members shall continue listening out on 121,5 MHz. If no headsets are used (using the SELCAL function), the frequency 121,5 MHz shall be monitored using the speaker function.

2.1.10.2 Communication rules

Standard phraseology as published in ICAO document 4444 shall be used. Flight Crew Members shall become familiar with ATC procedures and phraseology used within all areas of operation.

When transferring radio communication from the PM to the PF, the following callouts shall be made:

Table: Callouts transferring radio communication

Callouts transferring radio communication		
Situation	PF	PM
PM requests transfer of radio	--- My COM 1 *or* my COM 2	Your COM 1 *or* your COM 2 ---
Radio transfer terminated	--- Your COM 1 *or* your COM 2	My COM 1 *or* my COM 2 ---
Note: When referring to "RADIOS" instead of "COM 1" or "COM 2", it means that all radio communication is transferred (i.e. "MY RADIO'S"). During normal operations typically only 1 radio control is transferred whilst during non-normal operations this is done for all radios when determining the task distribution.		

2.1.10.3 HF transceiver and SELCAL

Each time a new frequency is selected, the transceiver needs a short mute transmission to tune the antenna. It is available for normal transmission and reception when the display shows a steady channel and frequency indication.

NOTE

Each aircraft is equiped with 2 HF transceivers and has a SELCAL code.

2.1.10.4 CPDLC communication

► *Refer to the Operations Manual Part B Section* ***2.25.1 – Aircraft specific normal procedures***

2.1.11 Briefing procedures

► *Refer to the Standard Operating Procedures Manual Section 3-05 – Briefings*

► *Refer to the Operations Manual Part B Section **2.1.15 – Threat and error management***

To ensure mutual understanding and effective cooperation among Flight Crew Members and with ATC, in-depth briefings shall be conducted on each flight. Effective briefings shall be short, structured, concise and adapted to the particular conditions of the take-off or approach and landing.

Prior to the first flight of a mission, a complete briefing shall be conducted. The briefing for subsequent flights may be reduced when continuing with the same crew.

Crew briefings are aimed at the following objectives, in support of standard operating procedures:

1. Define and communicate action plans and expectations, under normal or non- normal conditions;
2. Define and communicate operational threats affecting the flight and how they are to be managed;
3. Confirm applicable task sharing (Flight Crew Member role and responsibility).

Briefings should be conducted during low-workload periods. The take-off briefing should preferably be conducted while the aircraft is stationary.

'Rushing during descent' is a significant factor in approach and landing incidents and accidents. To prevent any rush in initiating the descent and the resulting increased workload in conducting the approach, the descent preparation and the approach and go-around briefings should be completed as early as possible, before or during descent.

NOTE:
*Refer to section **2.7.4 - 'Rushing during descent' principle and dangers** of this manual for a more detailed explanation of the 'rushing during descent' principle and dangers.*

2.1.12 Flight Crew Member occupied

There will be occasions when the PM will be occupied and not immediately available for a requested function. Common sense and the context of the situation shall dictate the proper course of action. The PF, however, shall not divert his attention from the control and monitoring of the aircraft. Any change to the control of the aircraft shall be briefed by the PF to the PM when the PM is no longer unavailable.

2.1.13 Use of aircraft electronic charts

► *Refer to the Operations Manual Part A Section* ***8.3.21 – Use of aircraft electronic charts***

► *Refer to the Operations Manual Part A Section* ***8.9 – Electronic flight bag***

At Commander's (PIC's) discretion, electronic charts may be displayed on the DU's and used accordingly if it has been confirmed, as part of the appropriate briefing, that the electronic chart database is current. The same charts, in paper format when so required or displayed using the EFB, shall remain readily available in case of any failure related to the DU's.

NOTE

The aircraft electronic terminal charts, which may be displayed on the DU's, shall be referred to in the Company electronic flight bag (EFB) procedures and other Company manuals such as the MEL, as the integrated flight information system (IFIS) being a generic / general term used by the Company. Manufacturer documentation may use other or more specific terminology.

2.1.14 *Electronic flight bag*

SPA.EFB.100 (b) (3) AMC3 (b), SPA.EFB.100 (b) (3) AMC3 (c)

► *Refer to the Operations Manual Part A Section **1.1.5 – List of aircraft in service***

► *Refer to the Operations Manual Part A Section **8.9 – Electronic flight bag***

► *Refer to the Operations Manual Part B Section **1.4 – Types of operation***

► *Refer to the Operations Manual Part B Annex 1 - Supplementary Company checklist E545/ E550*

► *Refer to the Minimum Equipment List (MEL) ATA 46 – Information systems*

► *Refer to the Electronic Flight Bag Policy and Procedures Manual*

This section contains the aircraft specific electronic flight bag (EFB) operational procedures. The general procedures shall be depicted in the relevant section of the OM Part A as detailed in the reference above. Refer to the Minimum Equipment List (MEL) for the specific dispatch procedures with less than standard equipment.

For aircraft listed on the Company's Air Operator Certificate (AOC), the use of an EFB including type B software shall require a specific approval from the Competent Authority prior to operating. For aircraft listed on the Company's Declaration (DEC), the use of an EFB shall require a Company operational approval prior to operating.

Every Flight Crew Member shall ensure that his currency to perform as such is still valid.

2.1.14.1 General

The Company viewable stowage (i.e. portable) EFB system (i.e iPad mini) shall be used together with the standard operating procedures, and both shall be used in all the phases of the flight, assuring total situation awareness and all lookout principles without increasing the total workload in the flight crew compartment.

Flight Crew Members shall be aware of risk of distraction from PEDs in the cockpit. At all times, Flight Crew Members shall be conscious of the potential for distraction from their primary duties and employ strategies to mitigate this risk.

Both Flight Crew Members shall have downloaded the relevant flight data to their devices.

When a system update is required, it should preferably be performed over Wi-Fi, with sufficient time allocated to complete the process. It is strongly recommended that updates are not performed immediately prior to a flight, and that the device remains connected to both a power source and Wi-Fi throughout the process. Data and entries for individual flights may also be downloaded by transferring the data between the operating devices using the crossfeed function.

Flight data shall be updated during turnaround or if instructed by OCC.

2.1.14.2 Specific charging procedures

► *Refer to the Operations Manual Part A Section 8.9.4.6 – General charging procedures*

During flight the iPads may be charged through the AC plugs available in the cockpit. Two universal type power outlets are available, one behind each cockpit seat. As the power outlets are of the universal type, no special adapters are provided by the Company besides the two standard Apple universal power cables which can be used to charge the iPads in the aircraft and at outstation.

2.1.14.3 Pre-flight procedures

► *Refer to the Operations Manual Part A 8.9.5.4 - Jeppesen FD Pro application global settings*

As part of their pre-flight, Flight Crew Members shall:

1. Check the iPad for normal operations (i.e. no cracks, scratches, parts missing, etc);
2. Check all accessories for normal operations (i.e. covers, securing devices, power cables, etc);
3. Adjust the iPad screen brightness as desired;
4. Verify the status of the iPad battery to be sufficiently charged being:
    a. If able to charge in flight, at least 60% battery life;
    b. If unable to charge in flight, at least 60 % battery life + 10 % battery life for every hour of expected flight time;
5. Connect the device to the WIFI or mobile data if no WIFI is available;
6. Verify the status of the software and applications;
7. Check the revision status on both EFB's to ensure current updates are loaded in the system. If not, proceed with update procedures;
8. Retrieve all required operational documents by:
    a. Performing all required Crewbriefing tasks;
    b. Performing all Skylegs EFB tasks;
    c. Performing all Jeppesen FD Pro application tasks;
    d. Performing all TAILLOG application tasks;
    e. Updating flight data during turnaround or if instructed by OCC;
9. Select moving map and own-ship position on (if applicable), confirm inflight weather is selected off;
10. Check populated downloaded OFP data are correct and edit/fill in where necessary,
11. TAILLOG Pre-Flight report shall be controlled and signed by the Commander/PIC on his own device or when transferred from the device of the SIC to the Commander/PIC's device.
12. On arrival at the aircraft, ensure the viewable stowage devices are serviceable and the iPad is attached securely and correctly at the respective pilot's operating position.
13. Confirm correct Jeppesen FD Pro application global settings (refer to OM A 8.9.5.4)
14. Engage airplane mode;
    a. Confirm cellular mode is OFF;
    b. Confirm Wi-Fi mode is OFF;
    c. Confirm Bluetooth mode is OFF.

2.1.14.4 Before departure procedures

Before departure, and when the terminal charts on the iPad are expected to be used (i.e. in case IFIS is inoperative or not up to date), appropriate charts shall be selected on the Jeppesen FD Pro application.

Prior to take off, the Commander/PIC shall ensure that the EFB systems in use on the aircraft are safely stowed in viewable stowage and that the 'Lock Rotation' function is activated.

2.1.14.5 Taxiing the aircraft

Before taxi is commenced all Flight Crew Members shall check for free control movement and assuring that the EFB's do not interfere with the flight controls. Both Flight Crew Members shall have the airport chart available for viewing on their EFB devices and/or IFIS system whilst the aircraft is taxiing for departure.

Provisions in the Operations Manual Part B section **2.5.1 - Taxi procedures** shall be followed in order to minimise the risk of runway incursions.

2.1.14.6 Take Off / Departure

Both PF and PM shall have the appropriate charts on their EFB. From adjusting the takeoff power until reaching 1500 ft AGL or final segment climb the flight crew shall not program or touch the EFBs. The main focus in this segment shall be on establishing the aircraft for climb. In case of a published departure route the pilot shall only program or touch when it is safe to do so and not compromise the aircraft handling.

2.1.14.7 In-flight procedures

When the EFB’s are used during flight they shall be placed in a way to not interfere or block any emergency equipment, cockpit controls or limit the visibility on any flight instruments. No EFB’s shall be placed on the glare shield.

During non-critical phases of flight and while still in airplane mode, the Wi-Fi mode may be used for operational reasons. When no longer required, the Wi-Fi mode shall again be disengaged.

CAUTION

The aircraft Wi-Fi system shall not be used to perform updates to the operating system or any applications. The operating system and all applications shall remain readily available in flight, which is not the case when being updated. The data being used during flight may also no longer be available after the update.

During all phases of flight, at least one EFB shall remain in airplane mode disengaging cellular, Wi-Fi and Bluetooth mode.

When not required, the EFB shall be put in STBY mode to save battery life.

Flight crew may remove the EFB device from the mount, especially when giving briefings.

During cruise, the PM shall primarily have the TAILLOG “Flight Progress” page available for viewing on their EFB device whilst the PF shall have the relevant charts available.

An EFB (Electronic Flight Bag) environment poses a higher risk of distraction.

Therefore, from the completion of the Before Start checklist until the completion of the Shutdown checklist, the Pilot Flying (PF) shall not consult other EFB applications than the Jeppesen FD Pro Application (charts) unless deemed required for the safety of the flight.

Before descending below FL100, both flight crew shall place and secure their EFB device in the viewable stowage in the correct orientation.

2.1.14.8 Approach procedures

Before starting the approach and when the terminal charts on the iPad are expected to be used (i.e. in case IFIS is inoperative or not up to date), appropriate charts shall be selected on the Jeppesen FD Pro application.

The Commander (PIC) shall ensure that the EFB systems in use on the aircraft are safely stowed in viewable stowage and that the 'Lock Rotation' function is activated.

When entering the final approach segment, flight crews shall no longer program the EFB's.

2.1.14.9 Post-flight procedures

'Airplane Mode' shall be switched off in order that the EFB can send and receive data. The flight crew shall ensure that a minimum of one EFB has connectivity via WiFi or cellular. If connectivity cannot be achieved, the flight crew shall report the issue as soon as practicable to OCC.

The post flight report shall be completed. Confirm that the following times are already filled in:

- OFF Block Time
- Take-off Time

Enter the following required data:

- Landing Time
- ON Block Time
- Name of the Pilot Flying (PF)
- Fuel on board after arrival
- Fuel Burn (calculated)
- Reason for any fuel difference

The report must be submitted from the Commander (PIC)'s iPad (EFB). If filled in on the other crewmember's iPad, the completed report shall first be transferred to the Commander (PIC)'s EFB.

The Commander (PIC) must sign the post-flight report to approve it.

2.1.15 Threat and error management

2.1.15.1 General

There are three basic components in the threat and error management (TEM) model:

1. Threats,
2. Errors,
3. Undesired aircraft state (UAS).

Threats and errors are part of everyday aviation operations that shall be managed by the crew, since both threats and errors carry the potential to generate an undesired aircraft state (UAS). The crew shall also manage undesired aircraft states, since they carry the potential for unsafe outcomes. Undesired aircraft state management largely represents the last opportunity to avoid an unsafe outcome and thus maintain safety margins in flight operations.

2.1.15.1.1 Threats

Threats are defined as ‘events or errors that occur beyond the influence of the crew, increase operational complexity, and which shall be managed to maintain the margins of safety’. During typical flight operations, the crew shall have to manage various contextual complexities. Such complexities would include, for example, dealing with adverse meteorological conditions, aerodromes surrounded by high mountains, congested airspace, aircraft malfunctions, errors committed by other people outside of the cockpit, such as air traffic controllers, etc.

These threats need to be identified early in order that solutions can be discussed and implemented by the crew to resolve threats before they become a reality. Unresolved threats can become errors and have a negative impact on the safety of the flight.

2.1.15.1.2 Errors

Errors are defined as ‘actions or inactions by the crew that lead to deviations from organisational or crew intentions or expectations’. Unmanaged and/or mismanaged errors frequently lead to undesired aircraft states. Errors in the operational context thus tend to reduce the margins of safety and increase the probability of adverse events.

2.1.15.1.3 Undesired aircraft state

Undesired aircraft state (UAS) is defined as ‘crew-induced aircraft position or speed deviations, misapplication of flight controls or incorrect systems configuration, associated with a reduction in margins of safety’. Undesired aircraft states that result from ineffective threat and/or error management may lead to compromising situations and reduce margins of safety in flight operations.

2.1.15.2 Threat and error management part of crew briefings

Crew briefings shall identify threats known to exist. When identified, options and solutions shall be discussed in order to eliminate or reduce the threat level to acceptable. Company Flight Crew Member shall use the 'TWO-C' principle as part of their 'threat briefings':

1. **T** – Terrain: The crew shall consider the terrain around the area in which the aircraft is operating;
2. **W** – Weather: The crew shall examine the weather and the impact this may have on aircraft performance;
3. **O** – Operational: Any other operational threats which may have impact on the aircraft (e.g. MEL items, NOTAM's, aerodrome layout, QFE operations, etc);
4. **C** – Crew: Self-assessment of the crew ability to carry out their duty (e.g. fatigue, unfamiliar with the aerodrome, etc).

2.1.16 Clean cockpit concept

► *Refer to the Operations Manual Part B Section **2.1.4 – Sterile cockpit concept***

Loose items in a cockpit have been a contributing factor in some aviation incidents and accidents. In view of the possible consequences, the cockpit should remain clean and tidy at all times during flight.

Flight crew Members shall incorporate the following checks in their pre-flight actions in order to ensure their working environment is well secured for a flight:

1. Inspect the cockpit for forgotten or misplaced items before take-off and ensure all are properly secured. This also helps to assure their availability throughout the flight;
2. All personal items such as jackets, PED's or luggage shall be secured;
3. If necessary, remind the observer seat occupant not to create distractions and to adopt the same measures and discipline against unsecured items.

This attitude and level of alertness shall be maintained during the flight, putting a particular emphasis on this concept when sterile cockpit procedures are in force.

NOTE

The Company provides Company loose equipment bags in each cockpit to be able to securely store smaller items if required.

Items that may be present in the cockpit shall be put and stowed at their dedicated location using the following principle:

Table: Clean cockpit concept

Clean cockpit concept		
Item / location	Non-sterile cockpit	Sterile cockpit
Beverages	Beverages when contained in cups shall be placed in the cupholders. The same shall apply to beverage cans and bottles once opened.	No cups or opened cans shall be present in the cockpit. Bottles may be stored in cupholders for use on the condition that they can be closed when not being used.
Meals	Meals shall only be consumed by one FCM at a time. Clear coordination between FCM's to be established to designate duties in such a case. The FCM consuming the meal, shall not perform any Pilot Flying (PF) duties while doing so.	Meals shall not be consumed and required catering material shall not be present in the cockpit.
Central pedestal and glareshield	No item shall be placed on the central pedestal or glareshield.	
Headsets	Headsets when not in use shall be hung on the provided hook.	Headsets shall be used.
Manuals and paperwork	Manuals and paperwork when not being used, shall be placed in a lateral stowage position which may include behind or besides cockpit seats.	During critical phases of flight, no items shall be placed between the cockpit seat and the central pedestal (i.e. inboard).
Trash	As soon as practicable, trash shall be placed in the waste bin or properly secured.	No unsecured trash shall be present in the cockpit.
Small loose equipment (e.g. staplers, etc)	Items shall not be placed on or near flight controls.	Small loose equipment shall not be used unless required for the safe operation of the flight.
Personal flight bags, Company loose equipment bags, etc	They shall be closed again after obtaining whatever was necessary.	They shall not be accessed during critical phases of flight unless required for the safe operation of the flight.

2.1.17 Use of erroneous take-off parameters

► *Refer to the Operations Manual Part B Section* ***2.5.4.1 – Take-off briefing***

2.1.17.1 General

The use of erroneous take-off parameters is a safety issue of general concern. It can result in early rotation with the potential for tail strike, collision with obstacles in the departure path, loss of control immediately after becoming airborne or runway overrun (i.e. as a result of either failure to get airborne or a decision to reject the take-off). In a number of cases, the loss of an aircraft during take-off has been directly attributed to the use of erroneous take-off parameters.

Most frequently, the erroneous parameters are derived as a result of using an incorrect value for the aircraft take-off mass but can also be linked to data entry errors, reference to the wrong performance chart, failure to update the parameters to reflect a runway change, an intersection departure or changing weather conditions or selection of a take-off configuration that does not match that assumed in the performance calculations.

2.1.17.2 Precautionary procedure

Flight Crew Members shall take the following precautions:

1. Give yourself enough time to perform calculations and enter data into the flight management system (FMS). Beware of distractions;
2. FMS data entry shall be slow and deliberate to ensure that the data entered reflects your intentions;
3. Double check data that has been entered to ensure consistency;
4. The FMS will not alert the Flight Crew Member if there is an incorrect entry. So check the FMS to detect unrealistic values and significant errors (i.e. gross error check);
5. If the take-off is abnormal, react promptly.

2.1.17.3 Gross error check

The range of variables in some parameters affecting aircraft performance data can be so great that it would not be possible for Flight Crew Members to know precisely what to expect in every circumstance.

However, it is possible to develop ‘rules of thumb’ and gross error checks for many of the values that are input to and output by the FMS on a given aircraft type. Knowing roughly what to expect from a calculation before it is executed, or what performance parameters an aircraft is likely to exhibit, will help Flight Crew Members to recognise potential data anomalies.

2.2 Pre-flight procedures

► *Refer to the Standard Operating Procedures Manual Section 2-07 – Normal checklist: Internal safety inspection*

► *Refer to the Standard Operating Procedures Manual Section 2-09 – Detailed normal procedures: Internal safety inspection and external inspection*

► *Refer to the Operations Manual Part B Section **10 – Survival and emergency equipment including oxygen***

2.2.1 General

The following task sharing procedures shall be applicable:

Table: Task sharing flight preparation

Task sharing flight preparation(1)						
Item	CMDR (PIC)	SIC	CM1	CM2	PF	PM
Weather and NOTAM's	X	X				
Operational flight plan	X					
ATC flight plan and slot	X					
Technical status, MEL and DDL	X					
Legal and operational documents	X					
Electronic flight bag (EFB)	X					
Pre-flight external check	X					
Pre-flight safety check	X					
Pre-flight security check	X					
Fuel	X	X				
Catering		X				
Cleaning		X				
Note 1: During the flight preparation, all legal and operational documents shall be checked by the Commander (PIC) and signed accordingly (where required) for acceptance. It is however common practise for the other Flight Crew Member to print and prepare all relevant paperwork giving the Commander (PIC), when both Flight Crew Members meet for the pre-flight briefing, an update on the actions already performed.						

The Commander (PIC) shall check the emergency and safety equipment during the pre-flight safety check. He checks the presence and condition of the emergency and safety equipment by means of the cabin & emergency layout. The pre-flight safety check shall always be performed before each first flight or before a series of flights. The pre-flight safety check includes:

1. All portable emergency equipment installed on board,
2. All fixed equipment installed in the aircraft,
3. The emergency light system,
4. All available seats,
5. The toilet area,
6. The galley area,
7. The cargo compartment.

Deficiencies in safety equipment shall be checked according to the MEL. Equipment found at a wrong place shall be re-stowed at the appropriate location.

The Commander (PIC) is also responsible to check the aircraft for suspicious items. This means performing a visual check for suspicious items in cargo holds, toilets, bins, seat pockets, the area under and between seats, the waste bags, wardrobes, galleys, lockers etc. The aircraft shall be checked for items left behind, on purpose or not, by passengers, handling staff, cleaning staff etc. Some items may endanger the safety of the flight and therefore a thorough security check shall be completed. The security check shall be performed when cleaning and catering personnel have left the aircraft and before any passengers arrive at the aircraft.

The pre-flight inspection shall be signed off by the Commander (PIC) in the aircraft technical log (ATL). In case of Maintenance Personnel or the other Flight Crew Member completing the pre-flight inspection, it may be shortened. The pre-flight safety check and pre-flight security check shall always be completed by a Flight Crew Member. The final responsibility remains at all times with the Commander (PIC).

The following task sharing procedures shall be applicable:

Table: Task sharing cockpit preparation

Task sharing cockpit preparation(1)						
Item	CMDR (PIC)	SIC	CM1	CM2	PF	PM
Cockpit setup including EFB					X	X
CPDLC log-on(2)						X
Cabin status & catering		X				
Immigration & Customs	X					
Luggage	X					
Passenger handling	X					
Passenger boarding & briefing	X					
Take-off briefing					X	
Note 1: During the cockpit setup, all mission-related entries are normally performed by the PF and verified by the PM. As the Commander (PIC) is however taking care of the passengers, it is common practice for the other Flight Crew Member to prepare the cockpit before arrival of the passengers. The other Flight Crew Member shall, in that case, brief the Commander (PIC) on the setup already performed. *Note 2: On departure from an aerodrome that is situated in a FIR where CPDLC is available, CPDLC log-on shall be established either on the ground no earlier than 45 minutes before departure or after passing 10,000 ft in the climb.*						

The NAV lights shall be on to indicate to any ground personnel that the aircraft is powered (either by battery, GPU or APU).

The RED BCN Light shall be on to indicate to any ground personnel that the aircraft engines are or may be started and/or that the aircraft is or may start taxiing. The same procedure shall be applicable when towing the aircraft under control of ATC.

Embarkation shall not commence until the Commander (PIC) has given clearance to do so. Embarkation shall not commence until the crew has confirmed that the passenger steps are safely in position. Passengers shall not be allowed to embark the aircraft without at least one Flight Crew Member present.

2.2.2 Fueling procedures

► *Refer to the Airplane Operations Manual Section 3 – Fuel system servicing*

► *Refer to the Operations Manual Part A Section **8.2.1 – Fueling procedures***

Before fuelling the aircraft, the aircraft shall statically be grounded to the servicing unit.

2.2.3 APU operations

► *Refer to the Airplane Operations Manual Section 3 – Auxiliary power unit (APU) servicing*

► *Refer to the Airplane Operations Manual Section 9-04 – Auxiliary power unit*

No APU may be started while fuelling is in process. Prior to starting the APU, the NAV lights shall be switched on.

The use of the APU gives the crew the opportunity to complete the majority of the exterior and interior inspection. The crew may establish the cabin environment at a comfortable level prior to the arrival of the passengers.

Special consideration shall be given to noise-sensitive aerodromes where APU operation is either prohibited or restricted.

CAUTION

The aircraft APU is not certified for unattended operation. A Flight Crew Member shall remain in the vicinity of the aircraft and shall regularly check the online status of the APU generator.

2.2.4 Flight ID

The flight ID shall be inserted during cockpit preparation prior to each flight. The flight ID shall be the flight number as inserted in item 7 of the flight plan. For the Company, this is normally the callsign of the aircraft.

The flight ID shall be crosschecked with the flight ID in item 7 of the ATC flight plan. If there is any doubt, please confirm your flight ID with the Company OCC.

Do not place any spaces or symbols in the flight ID.

2.2.5 Transponder operations

► *Refer to the Airplane Operations Manual Volume 3 Section 9-09 – Controls and indications: Transponder*

When powering up the aircraft, it shall be verified that the transponder is in the STBY mode. A transponder shall not transmit when the aircraft is stationary on the apron. Before starting to taxi, the transponder shall be put in the AUTO mode.

CAUTION

The transponder shall be ON during all phases of flight and during aerodrome surface movement operations when ADS-B OUT is required. If the transponder is not ON, ADS-B OUT is not functional.

Check the appropriate aerodrome charts for the applicable procedures if described. Aerodrome procedures may deviate from the procedure as set out above.

2.3 Pre-departure procedures

► *Refer to the Standard Operating Procedures Manual Section 2-07 – Normal checklist: Power up, before start and after start*

► *Refer to the Standard Operating Procedures Manual Section 2-13 – Detailed normal procedures: Power up*

► *Refer to the Standard Operating Procedures Manual Section 2-17 – Detailed normal procedures: Before start*

► *Refer to the Standard Operating Procedures Manual Section 2-23 – Detailed normal procedures: Engine start*

► *Refer to the Standard Operating Procedures Manual Section 3-10 – Ground operations*

The Commander (PIC) shall ensure that passengers are briefed of the escape routes and exits of the aircraft, that they are informed of the location and the use of the emergency equipment on board of the aircraft. He shall also make sure that:

1. Aft divider doors are open for take-off and landing;
2. Cabin occupants' seat belts are properly secured;
3. Crew seat belts and shoulder harnesses are secured;
4. The parking brake is set and/or chocks are in place.

The following task sharing procedures shall be applicable:

Table: Task sharing before start

Task sharing before start						
Item	**CMDR (PIC)**	**SIC**	**CM1**	**CM2**	**PF**	**PM**
Doors	X					
ATC clearance			X	X		
Engine start					X	
Note 1: The Commander (PIC) closes the doors. The other Flight Crew Member shall monitor door indications in the cockpit. *Note 2: ATC clearance should preferably be obtained when both Flight Crew Members are at their station.* *Note 3: The PF shall start the engines while the PM shall monitor engine parameters. The PF shall call out loud all applicable engine parameters (e.g. "ITT", 'N1", etc). No other tasks shall be performed by any Flight Crew Member while starting the engines.*						

Before starting the engines, both Flight Crew Members shall verify that the area around the aircraft is free and it is safe to start the engines. CM1 shall call "LEFT FREE" and CM2 shall call "RIGHT FREE".

2.4 Altimeter setting and checking procedures

CAT.OP.MPA.101

► *Refer to the Standard Operating Procedures Manual Section 3-05 – Operating policies: Altimeters*

► *Refer to the Operations Manual Part A Section **8.3.3 – Altimeter setting procedures***

► *Refer to the Operations Manual Part A Section **8.3.4 – Altitude alerting system procedures***

► *Refer to the Operations Manual Part B Section **2.21 - QFE altimeter setting and metric units operation procedures***

2.4.1 General

It is obvious that the altimeter is a primary instrument on board of the aircraft. Statistics show that level busts are an increasing safety issue in busy airspace. Strict adherence to the altimeter procedures is essential for safe operations.

During the pre-flight instrument scan, altimeter readings shall be verified to comply with limitations set by the Manufacturer and by the Operations Manual.

The Company uses QNH as standard value. Care shall be taken when converting QNH to QFE values. The same care shall be taken when operating into countries applying metric units of altitude.

Flight crews are reminded that when transitioning from standard pressure to QNH (QFE), the selected QNH (QFE) must be verified for consistency using all available information. As a best practice, crews are expected to cross-check the QNH (QFE) against the following three independent sources whenever available:

- METAR information for the destination aerodrome
- ATIS or VOLMET information
- QNH (QFE) transmitted by ATC during descent or approach clearance

Any discrepancy between these sources must be clarified with ATC without delay.

The expected QNH (QFE) shall be explicitly stated during the approach briefing, and crews are reminded to maintain heightened awareness for any subsequent QNH (QFE) updates issued by ATC. Particular attention is required when flying procedures that rely on barometric vertical navigation, where incorrect QNH settings may not be detected by standard altitude cross-checks alone. The use of standard phraseology and full readback of barometric settings remain essential at all times. Refer to **2.4.3 - Standby altimeter** for the use of the standby altimeter during the descent phase.

Whenever the outside temperature deviates from standard temperature, the indicated altitude (height) deviates from the true altitude (height):

1. At high temperature, the true altitude (height) is higher than the indicated altitude (height);
2. At low temperature, the true altitude (height) is lower than the indicated altitude (height), resulting in reduced terrain clearance.

Altimeters shall be checked and crosschecked during the following stages of flight:

1. During the taxi instrument check;
2. When lining up on the runway (runway elevation check);
3. During climb when climbing to a flight level;
4. During descent when descending to an altitude (height);
5. During approach when passing the outer marker (OM) or leaving the final approach fix when no outer marker is available.

When climbing to a flight level from an altitude (height), the following practice shall be applied:

Table: Callouts climbing to a flight level

Callouts climbing to a flight level		
Situation	PF	PM
Climbing to flight level, when passing transition altitude(3)	Set standard	---
PF and PM set standard on their respective altimeter(2)	---	Standard set, passing FL xx ... top
PF verifies the crossing FL	Checked, within limits(1)	---
***Note 1**: Refer to the OM Part A Section **8.3.2.4 – RVSM operations** for the applicable RVSM operation limitations and, if required, contingency procedures.* ***Note 2:** Changes to the standby altimeter shall be done by the PM.* ***Note 3:** Setting the altimeter setting to QNE at an altitude lower than the transition altitude during the climb out when cleared to a flight level is considered 'non standard' and shall be announced as such to assure crew awareness.*		

When descending to an altitude or height, the following practice shall be applied:

Table: Callouts descending to an altitude or height

Callouts descending to an altitude or height		
Situation	PF	PM
Descending to an altitude or height, when passing transition level(4)	Set QNH xxxx *or* set QFE xxxx	---
PF and PM set the QNH or QFE on their respective altimeter(2+3)	---	QNH set *or* QFE set, passing xxxx ft ... top
PF verifies the crossing altitude	Checked, within limits(1)	---
***Note 1**: In case the altimeter of the PF reads lower, the PF shall call "MINUS XXXX FT". In that case, the PF shall raise the applicable minima for the intended approach by the amount of the deviation. No correction should be made if the difference is within 50 ft.* ***Note 2**: Refer to the OM Part A Section **8.3.2.2.9 – RNP APCH general operational procedures** for the applicable RNP approach (RNP APCH) procedure limitations and, if required, contingency procedures.* ***Note 3:** Changes to the standby altimeter shall be done by the PM.* ***Note 4:** Setting the altimeter setting to QNH at an altitude higher than the transition level during descent when cleared to an altitude is considered 'non standard' and shall be announced as such to assure crew awareness.*		

When ATC assigns a new level, the following practice shall be applied:

Table: Callouts climbing or descending to a new level (autopilot engaged)

Callouts climbing or descending to a new level (autopilot engaged)		
Situation	PF	PM
ATC instruction received	Altitude (height) xxxx *or* FL xxx set	---
PM checks his altimeter indication	---	Checked
1.000 ft before reaching the assigned level	One thousand to go	---
PM checks his altimeter indication	---	Checked
ALT (steady)	ALT green	---
PM cross-checks	---	Checked

Table: Callouts climbing or descending to a new level (autopilot disengaged)

Callouts climbing or descending to a new level (autopilot disengaged)		
Situation	PF	PM
ATC instruction received	Set altitude (height) xxxx *or* FL xxx	---
PM sets the assigned level	---	Altitude (height) xxxx *or* FL xxx set
PF checks his altimeter indication	Checked	---
1.000 ft before reaching the assigned level	One thousand to go	---
PM checks his altimeter indication	---	Checked
ALT (steady)	ALT green	---
PM cross-checks	---	Checked

Unless otherwise specified in an air traffic control instruction, to avoid unnecessary TCAS resolution advisories (RA's) in aircraft at or approaching adjacent altitudes or flight levels, climbing or descending to an assigned altitude of flight level shall be done at a rate less than 1.500 ft/min throughout the last 1.000 ft of climb or descent.

CAUTION

When the autopilot is in the altitude capture mode, subsequent vertical mode changes such as the selection of a vertical speed mode shall be prohibited as this may cause the autopilot either to cancel the altitude capture or not to properly capture the selected level. The performance of the autopilot during any level capture shall be closely monitored.

NOTE

In RVSM airspace the rate of climb or descent shall be reduced to 1.000 ft/min or less during the last 1.000 ft before reaching the assigned level unless otherwise instructed by ATC.

NOTE

During the last 1.000 ft before reaching the assigned level, non-operational items shall be limited and/or delayed allowing both Flight Crew Members to focus on the level off of the aircraft to the assigned level.

2.4.2 Altimeter corrections

CAT.OP.MPA.145 (a) AMC1

► *Refer to the Operations Manual Part B Section **2.23 – Cold weather operation***

2.4.2.1 General

This section deals with altimeter corrections for pressure, temperature and, where appropriate, wind and terrain effects. The Commander (PIC) shall be responsible for these corrections, except when under radar vectoring. In case of radar vectoring, the controller issues clearances such that the prescribed obstacle clearance shall exist at all times, taking the cold temperature correction into account.

2.4.2.2 Pressure correction

When flying at levels with the altimeter set to QNE (1.013,25 hPa), the minimum safe altitude (MSA) shall be corrected for deviations in pressure when the pressure is lower than the standard atmosphere. An appropriate correction is 30 ft (10 m) per hPa below 1.013,25 hPa.

When using QNH (QFE) as altimeter setting, a pressure correction shall not be required.

2.4.2.3 Temperature correction

► *Refer to the Operations Manual Part A Section **8.1.1.3 – Low temperature correction***

Based on the aerodrome temperature, corrections to the barometric DA(H) and MDA(H) shall be applied to compensate for the negative outside air temperature (OAT) effect on true altitude. Refer to the OM Part A for a more detailed procedures and correction table.

2.4.2.4 Wind correction

The combination of strong winds (and mountainous terrain) may cause local changes in atmospheric pressure due to the Bernoulli Effect. This occurs particularly when the wind direction is across mountain crests or ridges.

Corrections for wind speed shall be applied in addition to the standard corrections for pressure / temperature and ATC should be advised.

Table: Values (ft) to be added to minimum altitudes (heights) due to wind

Values (ft) to be added to minimum altitudes (heights) due to wind	
Wind speed (kts)	Altimeter error (ft)
20	53
40	201
60	455
80	812

2.4.3 Standby altimeter

The standby altimeter provides backup altitude indication if one or both of the primary altimeters are lost. When approaching the destination, the destination airfield QNH (QFE) is set in the standby altimeter when received by ATC or ATIS. It shall then be compared with the METAR for the destination aerodrome, any discrepancy or inconsistency shall be investigated and resolved. When cleared to descend to an altitude (height), the QNH (QFE) given by ATC at that time will be compared with the value set on the standby altimeter for possible gross error detection.

Any discrepancy between these sources must be clarified with ATC without delay.

2.4.4 Radio altimeter

When the radio altimeter becomes alive, the PF/PM (first to notice) calls “RADIO ALTIMETER ALIVE”. The PM/PF verifies that this is consistent with the aircrafts position and altitude and replies “CHECKED”.

It is essential that when the radio altimeter comes alive during a phase of the flight where it is not expected, immediate action is required, especially in IMC. A terrain avoidance action shall be considered, except if it can be established with reasonable certainty that the terrain clearance is sufficient and will be maintained.

2.4.5 Altitude selector

► *Refer to the Operations Manual Part A Section **8.1.3 – Methods for determination of aerodrome operating minima***

► *Refer to the Operations Manual Part B Section **2.9 - VFR approach procedures***

► *Refer to the Operations Manual Part B Section **2.10 - IFR approach procedures***

► *Refer to the Operations Manual Part B Section **2.11 - Visual approach and circling***

When cleared to a certain level during climb or descend, the altitude selector shall be set to the assigned level. When flying a SID, in the absence of a limiting level supplied by ATC, the altitude selector shall be set to the first limiting level on the SID.

NOTE

When selecting ‘VNAV’ as vertical mode, the altitude selector shall be the limiting factor in the level of automation as it will never pass through the level selected

During descent on a CAT I approach, the altitude selector shall remain set to the last assigned level until the vertical profile is captured. After capture, it shall then be reset to the missed approach altitude (height).

During descent on an APV approach, the altitude selector shall remain set to the last assigned level until the vertical profile is captured. After capture, it shall then be reset to the missed approach altitude (height).

During descent on an NPA approach, the altitude selector shall remain on the last assigned level until inbound to the FAF. About 1 to 0,5 NM before the FAF, set the altitude selector 500 ft above the current altitude (or the missed approach altitude if higher) to prevent ‘altitude hang- up’ and prepare to set the appropriate vertical speed to be ready for descent at the FAF.

If the missed approach altitude is at or below the last assigned level (i.e. inbound to the FAF), the altitude selector shall be reset to the missed approach altitude once the final descent begins and the aircraft is below the missed approach altitude.

During descent on a circling approach, the altitude selector shall be set to the circling minima. When maintaining the MDA(H) it shall be reset to the missed approach altitude (height).

When performing a visual approach, the altitude selector shall be set to 1.500 ft above aerodrome elevation (AAL) unless depicted otherwise.

2.5 Taxi, take-off and climb procedures

2.5.1 Taxi procedures

CAT.GEN.MPA.124, CAT.GEN.MPA.124 AMC1, CAT.GEN.MPA.125, NCC.GEN.119, NCC.GEN.119 AMC1

► *Refer to the Standard Operating Procedures Manual Section 2-07 – Normal checklist: Before take-off*

► *Refer to the Standard Operating Procedures Manual Section 2-23 – Detailed normal procedures: Engine start*

► *Refer to the Standard Operating Procedures Manual Section 2-25 – Detailed normal procedures: After start*

► *Refer to the Standard Operating Procedures Manual Section 3-10 – Engine start*

► *Refer to the Standard Operating Procedures Manual Section 3-10 – Taxi*

► *Refer to the Operations Manual Part A Section **8.2.2.11 – Start-up, ramp departure and arrival procedures***

► *Refer to the Operations Manual Part B Section **2.1.4 – Sterile cockpit concept***

CAUTION

Taxiing shall be treated as a safety-critical activity due to the risks to the movement of the aeroplane and the potential for a catastrophic event on the ground. Taxiing is a high- workload phase of flight that requires the full attention of the crew.

CAUTION

Taxiing with only one engine running (i.e. single-engine taxi) shall not be allowed.

The PF performs the taxi. Before taxiing the aircraft, both Flight Crew Members verify that the area around the aircraft is free and it is safe to move forward. The PF calls “LEFT (RIGHT) FREE”, the PM replies “RIGHT (LEFT) FREE”.

NOTE

The use of the term ‘clear’ is not allowed in this context (e.g. “RIGHT (LEFT) IS CLEAR”).

If the Commander (PIC) is the PF, he shall call “TAXI, MY CONTROL” when ready for taxi, the PM in multi-pilot operations shall reply “YOUR CONTROL”. If the Commander (PIC) is the PM in multi-pilot operations, he shall call “TAXI, YOUR CONTROL” when ready for taxi, the PF shall reply “MY CONTROL” allowing the PF to commence the taxi procedure.

If the PF is CM2, he shall first press the brakes, requesting the CM1 to release the parking brake by calling “SELECT PARKING BRAKE OFF”. The CM1 shall respond with “PARKING BRAKE OFF” when the parking brake handle is pushed fully in.

Checking the brakes, the PF calls “CHECKING MY BRAKES”. To request a brake check from the other Flight Crew Member, he calls “CHECK YOUR BRAKES”.

Performing an instrument check during a turn, the PF checks the primary flight instruments and calls the applicable readings. The PF crosschecks the readings called out by the PM to confirm by “CROSSCHECKED”.

Every Flight Crew Member’s seat and rudder pedals shall have been adjusted so that it is possible to apply maximum braking with full rudder deflection. During taxiing, both Flight Crew Member’s heels shall be on the floor, sliding the feet up on the rudder pedals only when required to apply brakes to slow the taxi speed or when manoeuvring on the ramp.

Before commencing the taxi, both Flight Crew Members shall assure during the before taxi checklist that the area is free of all ground equipment and acknowledge that the GPU (if used) is disconnected from the aircraft. The PM shall switch on the TAXI lights before commencing the taxi.

Flight Crew Members shall take all available measures to enhance situational awareness. This shall be done during taxi by:

1. Applying the sterile cockpit procedures;
2. Using only standard radiotelephony (RTF) phraseology;
3. Having the necessary aerodrome layout charts available;
4. Hearing and understanding all taxi clearances by both Flight Crew Members;
5. Crosschecking all taxi clearances against aerodrome charts, surface markings, signs and lights;
6. Stopping and holding at all lighted stop bars. Proceeding shall only be done with explicit clearance to enter or cross the runway when it has been issued by the aerodrome control tower and when the stop bar lights are switched off;
7. Stopping the aircraft and contacting air traffic control when unsure of the current position.

The Pilot Monitoring (PM) shall monitor the Pilot Flying (PF) of the correct taxi routing and adherence to the taxi clearances.

Idle thrust is adequate for taxiing under most conditions. The tendency is to taxi faster than desired. This is especially true during a runway turn-off after landing.

Thrust use during ground operation demands sound judgement and technique. The air blast effects at relatively low thrust can be destructive and cause injury. Do not start a turn until sufficient forward speed has been attained to carry the aircraft through the turn at idle thrust.

Avoid following other aircrafts too closely. Jet blast is a major cause of foreign object damage (FOD).

For passenger comfort, adjust the taxi speed to the surface condition and turn radius. Nose wheel scrubbing indicates excessive steering angle and/or taxi speed for surface condition. The normal taxi speed shall not exceed approximately 20 Kts GS and prior to a turn, speed shall be slowed to the appropriate speed for the condition. To ensure maximum wingtip clearance during turns, yellow taxi lines shall be centered between the two main gears. A small overshoot of the nose wheel may be needed during turn initiation.

Both Flight Crew Members shall constantly maintain a good lookout especially during the initial phase of the taxi, whilst the aircraft has to be maneuvered closely to other aircraft such as when taxiing in congested areas. It is therefore recommended to postpone any other duties until the aircraft is free of all obstructions. Do not be diverted from the primary task of safely taxiing the aircraft, avoid all unnecessary activity and duties (including paperwork) that may be accomplished at another time.

TAXI lights shall be on during taxiing. When the aircraft comes to a stop, they shall be turned off. When performing the last turn towards a Marshaller, the PF should consider requesting the PM to turn the TAXI lights off.

STROBE lights shall be on any time the aircraft is on an active runway, even when just crossing it. TAXI lights shall be on below 10.000 feet. LANDING lights shall be on when cleared for take-off or cleared to land. LANDING lights may be on during taxi at night if environmental conditions so require.

All recommended braking techniques shall aim at minimizing the number of brake applications and controlling brake temperature. General rules are:

1. Avoid continuous, mild braking applications for extended periods of time;
2. Minimize the duration of each brake application when practical by using shorter applications with higher pressure on the pedals;
3. Avoid using brakes asymmetrically.

When taxiing when the brakes are cold, do not intentionally use the brakes solely to heat them. Taxi speed shall carefully be managed. Let the aircraft accelerate to a maximum safe speed and then use the brakes in one increasingly firm application to slow the aircraft. Then release the brakes and allow the aircraft to accelerate again. Less frequent use of brakes with higher braking pressure may improve brake life.

When taxiing when the brakes are warm, carefully manage taxi speed. Let the aircraft accelerate to a maximum safe speed, then apply brakes short but firm. This will help keep the brakes within operating temperature range limits by allowing more cooling time and less brake friction time. At landing, apply brakes with no delay after the nose landing gear has touched down. Move directly to a single firm and steady brake application and hold pedal pressure until decelerated to taxi speed. Apply pressure up to a maximum comfortable deceleration.

2.5.2 Towing and Pushback procedures

CAT.OP.MPA.205, CAT.OP.MPA.205 AMC1

► *Refer to the Standard Operating Procedures Manual Section 3-10 – Push-back*

2.5.2.1 General

There will be occasions when the aircraft may not be taxied directly from its parking position, requiring a tow or pushback. In this case, the crew shall ensure that adequate ground personnel are available to move the aircraft safely.

Ground towing can be accomplished by using a towbar and a towbar head coupled to the nose landing gear. The towbar head incorporates a breakable section (shear pin). The pin shears in case of any abnormality, to protect the airplane structure and the nose landing gear from damage

CAUTION

Aircraft towing without setting the steering switch to 'disengage' may result in structural damage. This switch is available on the external steering panel or in the cockpit.

While the aircraft is in motion, the RED BCN Light shall be on when towing the aircraft under control of ATC.

In case the towing or pushback is performed with a towbar, at least one Flight Crew Member shall remain in the cockpit to guard the brakes.

When the aircraft is being towed, including pushback, and it is intended to start the engines during or shortly after that tow for the purpose of taking off, both Flight Crew Members shall remain in the cockpit and all checklist(s) up to and including the before start checklist shall be completed before starting the tow.

2.5.2.2 Braking procedures

If braking is required from the cockpit, every Flight Crew Member shall make every effort to warn those towing the aircraft prior to applying the brakes by flashing for example the TAXI lights. If voice communications are used via VHF, the simple command "STOP THE AIRCRAFT" shall be used.

CAUTION

Aircraft braking, while it is under tow, may result in structural damage and/or nose landing gear collapse. If brake is applied during the towing procedure, detailed inspection for damages to the nose landing gear and its affected regions shall be performed prior to the next flight.

2.5.2.3 Communication with ground personnel

The crew shall establish communication with Ground Personnel via hand signals as appropriate. If there is any doubt as to which hand signals to use, the crew shall pre-brief the signals with the person leading the pushback or towing operation.

2.5.3 Thrust reverser check procedures

As no thrust reverser check is required by the Manufacturer; this section shall not be applicable.

2.5.4 Take-off procedures

► *Refer to the Standard Operating Procedures Manual Section 2-07 – Normal checklist: Before take-off and after take-off*
► *Refer to the Standard Operating Procedures Manual Section 2-29 – Detailed normal procedures: Before take-off*
► *Refer to the Standard Operating Procedures Manual Section 2-31 – Detailed normal procedures: Take-off*
► *Refer to the Standard Operating Procedures Manual Section 2-33 – Detailed normal procedures: After take-off*
► *Refer to the Standard Operating Procedures Manual Section 3-15 – Take-off, take-off mode and flight crew coordination during take-off*

2.5.4.1 Take-off briefing

The take-off briefing shall be given, after completion of the instrument set-up, by the PF designated for the sector and should cover:

1. ATIS, NOTAM's and weather;
2. MEL, CDL and DDL items affecting performance;
3. Receiver autonomous integrity monitoring (RAIM) availability (if required);
4. Take-off and landing dispatch conditions;
5. Take-off alternates (if weather required) including return procedures depending on the weather (i.e. VMC or IMC) and aircraft performance (e.g. maximum landing mass) in case of an occurrence after V1 including occurrences other than an engine failure;
6. Mass and balance;
7. Runway conditions and wind;
8. Take-off data including gross error check;
9. Noise abatement procedure NADP 1 "Noise one" or NADP2 "Noise two";
10. SID;
11. Engine failure procedures, including engine failure flap retraction altitude (EFFRA) and minimum sector altitude (MSA);
12. Navigation aid setup;
13. Rejected take-off procedures;
14. Taxi routing;
15. Use of EFB and/or IFIS system;
16. 'TWO-C' threats.

The take-off briefing should be given when stationary and updated later on for any subsequent last-minute changes. After the first sector, the take-off briefing may be reduced if items are standard referring to the standard operating procedures when the crew is flying more than one sector together in the same duty period.

A successful briefing is one that leaves neither Flight Crew Member in doubt as to circumstances prevailing. Should any doubt remain in the mind of the Flight Crew Member being briefed, he shall make sure that any uncertainty is clarified before the briefing stage is passed.

For the take-off briefing, touch drills may be used to recall Flight Crew Member's individual actions and duties, especially in case of rejected take-off. It shall cover:

1. Flight Crew Member actions and duties in case of malfunctions prior to V_1 resulting in a rejected take-off;
2. The routing and altitude constraints in case of engine failure at or after V_1;
3. The expected discipline in the overall conduct of the flight;
4. Any other important considerations.

The following task sharing procedures shall be applicable:

Table: Task sharing before and during take-off

Task sharing before and during take-off						
Item	CMDR (PIC)	SIC	CM1	CM2	PF	PM
Take-off call	X					
Engines spool up					X	
Thrust levers					X	
STOP decision					X	X
STOP actions					X	

Both Flight Crew Members shall verify that the approach area and runway are free of traffic and it is safe to enter the runway (if weather permits). The PF/PM shall call "APPROACH FREE", the PM/PF shall reply "CHECKED". The PM/PF shall call "RUNWAY FREE", the PF/PM shall reply "CHECKED".

Entering the runway, the PF shall read the barometric altimeter and shall call "THRESHOLD ELEVATION, XXXX FT". He shall also read the aircraft heading and shall call "RUNWAY QFU XXX". The PM verifies consistency of both readings and shall call "CHECKED".

During normal operations, the parking brake shall not be used on an active runway.
If the Commander (PIC) is the PF, he shall call "TAKE-OFF, MY CONTROLS" when ready for departure, the PM shall reply "YOUR CONTROLS". If the Commander (PIC) is the PM, he shall call "TAKE-OFF, YOUR CONTROLS" when ready for departure, the PF shall reply "MY CONTROLS" allowing the PF to commence the take-off procedure.

CAUTION

If compliance with the published performance requirements of the SID (or clearance received from ATC) is not possible, take-off shall be prohibited unless an alternate climb-out procedure which ensures terrain and obstacle clearance is established.

2.5.4.2 Crosswind take-off procedures

► *Refer to the Standard Operating Procedures Manual Section 3-15 – Crosswind take-off*

2.5.4.3 Turns immediately after take-off

Obstruction clearance, noise abatement or departure procedures may require an immediate turn after take-off.

Avoid turning below 400 ft AGL. If turning below 400 ft AGL cannot be avoided, limit bank angle to 15° maximum. ATC instructions may specify departure instructions deviating from these general rules.

Furthermore, the IAS shall be at or above manoeuvring speed (V_2 + 15) in order to increase bank angle above 15° but with a maximum of 30°.

With all engines operating, maintain V_2 + 15 and take-off flaps to the predetermined flap retraction altitude.

After completion of the turn, adjust the pitch attitude to accelerate and complete the flaps retraction sequence.

2.5.5 Climb procedures

► *Refer to the Standard Operating Procedures Manual Section 2-34 – Detailed normal procedures: Climb / cruise*
► *Refer to the Standard Operating Procedures Manual Section 3-20 – Climb and en-route climb*

During climb, both Flight Crew Members shall be performing a general crosscheck. Any abnormality shall be announced and taken care off. During climb with obstacle limitations, the PF shall take special care that the altitudes passing are at least those of the required climb gradient. The PF shall take special attention to the correct navigation of the SID and the engine parameters.

On a regular base, the following checks shall be performed:

1. Aircraft systems,
2. Engine parameters,
3. Fuel consumption.

2.6 Noise abatement procedures

CAT.OP.MPA.130, NCC.OP.120, NCC.OP.120 AMC1

► *Refer to the Standard Operating Procedures Manual Section 3-15 – Noise abatement procedures*

2.6.1 General

At many locations, the close proximity of aerodromes to densely populated areas has created considerable problems resulting from noise by aircraft landing and taking off. In many instances this has led Authorities to enforce noise abatement rules.

Flight Crew Members shall take all possible measures during take-off and landing to ensure that noise created be kept to a minimum and shall comply with relevant noise abatement procedures and ATC instructions. Safety of flight operations shall always take precedence over compliance with noise abatement rules and the final decision shall always rest with the Commander (PIC).

2.6.2 Noise preferential runways

At aerodromes where the preferential use of specific runways is prescribed, Flight Crew Members should normally use the preferential runway for landing or take-off only up to a tailwind component of 5 knots, including gusts, and up to a crosswind component of 15 knots, including gusts, provided:

1. The runway surface condition is not adversely affected;
2. All requirements in respect of runway length and obstacle clearance are met;
3. For landing in conditions when the ceiling is not lower than 500 ft AAL or for take- off and landing when the horizontal visibility is not less than 1 NM;
4. No wind shear has been reported or forecasted or no adverse weather conditions are expected to affect the approach or departure;
5. Compliance with the above is not in conflict with any other provision relating to tail wind and/or crosswind limitations.

2.6.3 Noise abatement departure procedure

CAT.OP.MPA.130 AMC1

The operating procedures for the take-off and climb shall ensure that the necessary safety of flight operations is maintained while minimizing exposure to noise on the ground. The following 2 operating procedures (NADP 1 and NADP 2) for the take-off and climb phase have been developed and are considered safe taking the following criteria into account:

1. Any noise abatement procedure shall not be executed below 800 ft AAL;
2. Executing of a noise abatement procedure is secondary to the satisfaction of any obstacle requirement;
3. The thrust settings to be used subsequent to the failure or shutdown of an engine or any other apparent loss of performance, at any stage in the take-off or noise abatement climb, are at the discretion of the Commander (PIC) and noise abatement considerations no longer apply;
4. Noise abatement climb procedures are not to be used in conditions where wind shear warnings exist or the presence of wind shear or downburst activity is suspected;
5. The maximum acceptable body angle specified for the aircraft type shall not be exceeded.

The first procedure (NADP 1) is intended to provide noise reduction for noise-sensitive areas in close proximity to the departure end of the runway. The second procedure (NADP 2) provides noise reduction to areas more distant from the runway end.

The two procedures differ in that the acceleration segment for flap retraction is either initiated prior to reaching the maximum prescribed level or at the maximum prescribed level. To ensure optimum acceleration performance, thrust reduction may be initiated at an intermediate flap setting.

NOTE

For both procedures, intermediate flap transitions required for specific performance-related issues may be initiated prior to the prescribed minimum level. However, no thrust reduction may be initiated prior to attaining that prescribed minimum level.

NOTE

The indicated airspeed for the initial climb portion of the departure prior to the acceleration segment shall be flown at a climb speed of V_2 + 10 to 20 Kts.

NOTE

Unless otherwise instructed, or when specific aerodrome procedures require otherwise, NADP 2 shall be used as the standard noise abatement procedure.

2.6.3.1 Noise abatement departure procedure 1

The noise abatement departure procedure 1 (NADP 1) involves a thrust reduction at or above the prescribed minimum level and delaying flap retraction until the prescribed maximum level is attained.

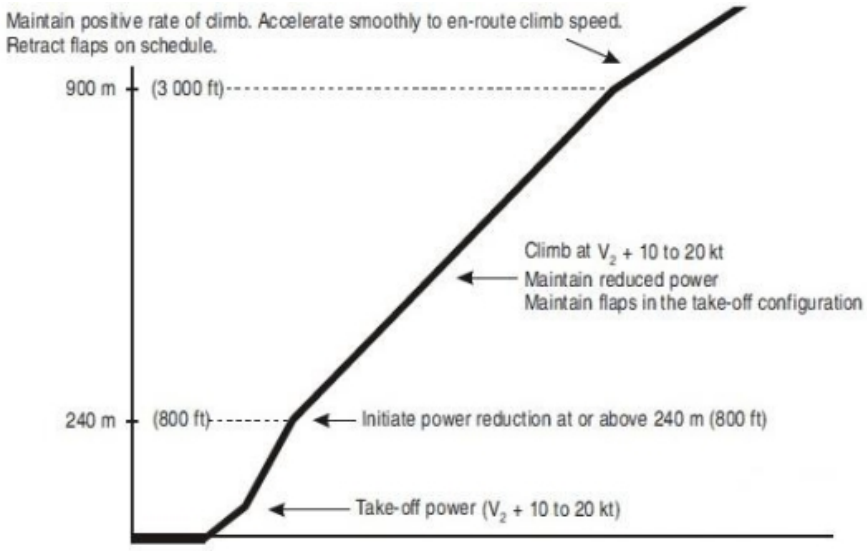
At the prescribed maximum level, accelerate and retract flaps on schedule while maintaining a positive rate of climb and complete the transition to normal en-route climb speed.

The noise abatement procedure is not to be initiated at less than 800 ft AAL. The initial climbing speed to the noise abatement initiation point shall not be less than V_2 + 10 Kts.

On reaching a level at or above 800 ft AAL, adjust and maintain engine thrust in accordance with the noise abatement thrust schedule provided in the Aircraft Flight Manual. Maintain a climb speed of V_2 + 10 to 20 Kts with flaps in the take-off configuration.

At no more than a level equivalent to 3.000 ft AAL, while maintaining a positive rate of climb, accelerate and retract flaps on schedule. At 3.000 ft AAL, accelerate to the normal en-route climb speed.

Figure: Noise abatement departure procedure 1



2.6.3.2 Noise abatement departure procedure 2

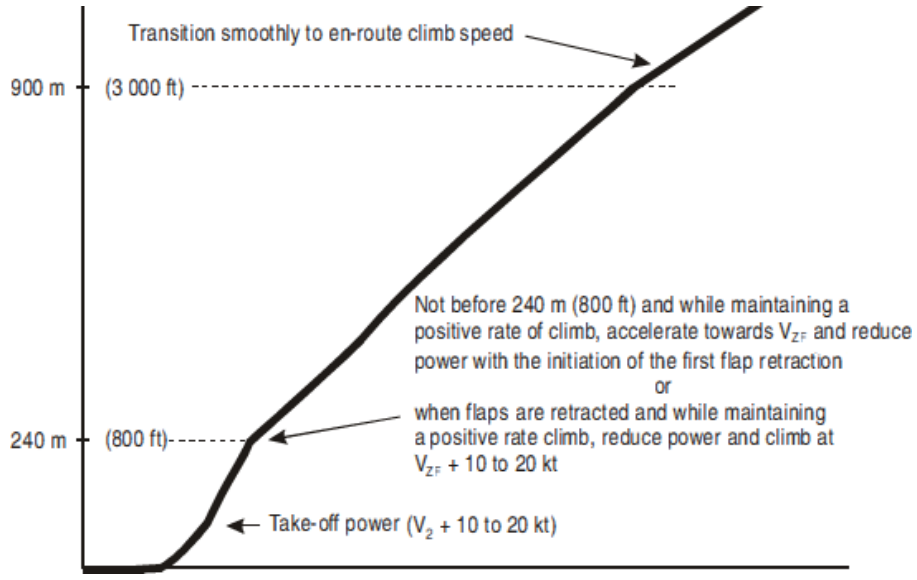
The noise abatement departure procedure 2 (NADP 2) involves an initiation of flap retraction on reaching the minimum prescribed level. The flaps are to be retracted on schedule while maintaining a positive rate of climb. The thrust reduction is to be performed with the initiation of the first flap retraction or when the zero flap configuration is attained. At the prescribed level, complete the transition to normal en-route climb procedures.

The noise abatement procedure is not to be initiated at less than 800 ft AAL. The initial climbing speed to the noise abatement initiation point is V_2 + 10 to 20 Kts.

On reaching a level equivalent to at least 800 ft AAL, decrease aircraft body angle whilst maintaining a positive rate of climb, accelerate towards flaps up speed and reduce thrust with the initiation of the first flaps retraction or reduce power after flaps retraction.

Maintain a positive rate of climb and accelerate to and maintain a climb speed equal to flaps up speed + 10 to 20 Kts till 3.000 ft AAL. At 3.000 ft AAL, accelerate to normal en-route climb speed.

Figure: Noise abatement departure procedure 2



2.6.4 Noise abatement approach procedure

In noise abatement approach procedures, which are developed:

1. The aircraft shall not be required to be in any configuration other than the final landing configuration at any point after passing the outer marker or 5 NM from the threshold of the runway of intended landing, whichever is earlier;
2. Excessive rates of descent shall not be permitted.

Compliance with published noise abatement approach procedures shall not be required in adverse operating conditions such as:

1. If the runway surface condition is adversely affected;
2. In conditions when the ceiling is lower than 500 ft AAL or when the horizontal visibility is less than 1 NM;
3. When the crosswind component, including gusts, exceeds 15 Kts;
4. When the tailwind component, including gusts, exceeds 5 Kts;
5. When wind shear has been reported or forecasted or adverse weather conditions are expected to affect the approach;
6. Compliance with the above is not in conflict with any other provision relating to tail wind and/or crosswind limitations.

2.6.5 Noise abatement landing procedure

Noise abatement procedures shall not contain a prohibition of use of reverse during landing.

2.7 Cruise and descent procedures

2.7.1 Cruise procedures

► *Refer to the Standard Operating Procedures Manual Section 3-25 – Cruise*

During cruise, both Flight Crew Members shall regularly perform a general crosscheck of all aircraft systems. The PM shall take care of the radio communication.

Special care shall be taken to ensure correct navigation. The PM shall follow the operational flight plan (OFP) and shall note all details as ETA, ATO, fuel burn, clearances and eventual rerouting. He shall also monitor any weather information and shall keep record of any weather change affecting the flight.

2.7.2 In-flight fuel management policy and procedures

► *Refer to the Operations Manual Part A Section 8.3.7 – In-flight fuel / energy management policy and procedures*

The Commander (PIC) shall continually ensure that the amount of usable fuel remaining on board is protected and not less than the fuel that is required to proceed to an aerodrome where a safe landing can be made. Refer to the OM Part A for more detailed procedures.

2.7.3 Descent procedures

► *Refer to the Standard Operating Procedures Manual Section 2-07 – Normal checklist: Descent*

► *Refer to the Standard Operating Procedures Manual Section 2-35 – Detailed normal procedures: Descent*

► *Refer to the Standard Operating Procedures Manual Section 3-30 – Descent*

► *Refer to the Operations Manual Part B Section **2.1.4 – Sterile cockpit concept***

► *Refer to the Operations Manual Part B Section **2.1.5.1.2 – Checklist triggers***

The descent checklist shall be commenced when descending towards the arrival aerodrome. Prior to initiating the checklist, the aircraft performance shall have been calculated and the approach, landing and go-around briefing given.

To aid in situational awareness, when descending through FL 100 or 10.000 ft AAL (whichever is higher) the PF shall call out “FL 100” or “10.000 FEET”. This shall serve as a check that the correct speed is being flown and that the sterile cockpit procedures become in force.

If descending to an aerodrome is mainly at the Flight Crew Member’s discretion, a general rule of thumb is to have the aircraft passing 10.000 ft AAL at least 30 NM from the destination aerodrome. This objective is to ensure an arrival in a terminal area at an altitude and speed that shall allow a stabilised descent and approach to the runway.

2.7.4 ‘Rushing during descent’ principle and dangers

► *Refer to the Operations Manual Part B Section **2.8.4 – Stabilised approach***

2.7.4.1 Introduction

Rushed and unstabilised approaches are the largest contributory factor in CFIT and other approach-and-landing accidents. Rushed approaches result in insufficient time for the crew to correctly plan, prepare and execute a safe approach.

Continuing an unstabilised approach is a causal factor in 40 % of all approach- and landing accidents.

2.7.4.2 Benefits of a stabilised approach

Conducting a stabilised approach increases the overall situational awareness by increasing:

1. Horizontal situational awareness by closely monitoring the flight path;
2. Speed awareness by monitoring speed deviations;
3. Vertical situational awareness by monitoring the vertical flight path and the rate of descent;
4. Energy awareness by maintaining the engine power to the level required to fly a 3° approach path at the final approach speed (or at the minimum ground speed, as applicable).

In addition, a stabilised approach provides the following benefits:

1. More time and attention are available for the monitoring of ATC communications, weather conditions and systems operation;
2. More time is available for effective monitoring and back-up by the PM;
3. Defined flight-parameter-deviation criteria and minimum stabilisation height support the decision to land or go-around;
4. Landing performance is consistent with published performance;
5. Situational awareness is increased.

2.7.4.3 Factors involved in unstabilised approaches

The following circumstances, factors and errors are often cited when discussing rushed and unstabilised approaches:

1. Fatigue (e.g. due to disrupted sleep cycle, personal stress, etc);
2. Pressure of flight schedule (e.g. making up for a delay);
3. Any crew induced or controller induced circumstances resulting in insufficient time to plan, prepare and execute a safe approach;
4. ATC instructions that result in flying too high and/or too fast during the initial or final approach (e.g. request for maintaining high speed down to the outer marker or for glideslope / glidepath capture from above, etc);
5. Excessive altitude and/or excessive airspeed (e.g. inadequate energy management) early in the approach;
6. Late runway change (i.e. lack of ATC awareness of the time required to reconfigure the aircraft systems for a new approach);
7. Non-standard task sharing resulting in excessive head down work (e.g. FMS reprogramming);
8. Short outbound leg or short downwind leg (e.g. in case of unidentified traffic in the area);
9. Inadequate use of automation: Late take-over from automation (e.g. in case of the autopilot failing to capture the glideslope / glidepath, usually due to crew failure to arm the approach mode);
10. Premature or late descent due to absence of positive FAF identification;
11. Insufficient awareness of wind conditions;
12. Incorrect anticipation of aircraft deceleration characteristics in level flight or on a glideslope / glidepath;
13. Failure to recognize deviations or to remember the excessive-parameter- deviation criteria;
14. Belief that the aircraft will be stabilised at the stabilization height or shortly thereafter;
15. Excessive confidence by the PM that the PF will achieve a timely stabilisation;
16. PF / PM over reliance on each other to call excessive deviations or to call for a go-around;
17. Visual illusions during the visual segment;
18. Continued approach without acquisition of adequate visual references or after loss of visual references;
19. Failure to accurately follow the PAPI or VASI;
20. Failure to adequately maintain the aiming point.

2.7.4.4 Company prevention strategy and personal lines of defence

The Company prevention strategy and personal line of defence to reduce the number of unstabilised approaches shall identify and minimise the factors involved (see above) and provide crew recommendations (see below) for the early detection and correction of unstabilised approaches.

Every Flight Crew Member shall implement the following four-step strategy:

1. Anticipate,
2. Detect,
3. Correct, and
4. Decide.

2.7.4.4.1 Anticipate

Some factors likely to result in a rushed and unstabilised approach shall be anticipated.

Whenever practical, Flight Crew Members and controllers should avoid situations that may result in rushed approaches.

The descent and approach briefing shall provide an opportunity to identify and discuss these factors.

2.7.4.4.2 Detect

Defined excessive parameter deviation criteria and a defined stabilisation height shall provide the PF and PM with a common reference for effective monitoring (e.g. early detection of deviations).

To provide the time availability and attention required for an effective monitoring, the following shall be avoided:

1. Late briefings,
2. Unnecessary radio calls,
3. Unnecessary actions,
4. Non-essential cockpit conversations (i.e. breaking the sterile-cockpit concept).

Reducing the workload, cockpit distractions and/or interruptions shall also provide the crew with more alertness and availability to:

1. Cope with fatigue;
2. Comply with an unanticipated ATC request (e.g. runway change or visual approach);
3. Adapt to changing weather conditions or approach hazards;
4. Manage a system malfunction (e.g. flaps failing to extend).

2.7.4.4.3 Correct

Positive corrective actions shall be taken before deviations develop into a challenging or a hazardous situation in which the only safe action is a go-around.

Corrective actions may include:

1. The timely extension of landing gear to correct an excessive altitude or an excessive airspeed;
2. Extending the outbound leg or downwind leg.

2.7.4.4.4 Decide

If the aircraft is not stabilised on the approach path in landing configuration, at the minimum stabilisation height, a go-around shall be initiated unless the crew estimates that only small corrections are necessary to rectify minor deviations from stabilised conditions due, amongst others, to external perturbations.

Following a PM flight parameter exceedance call-out, the suitable PF response shall be:

1. Acknowledge the PM call-out, for proper crew coordination purposes;
2. Take immediate corrective action to control the exceeded parameter back into the defined stabilised conditions;
3. Assess whether stabilised conditions will be recovered early enough prior to landing, otherwise initiate a go-around.

The following behaviors often are involved in the continuation of an unstabilised approach:

1. Confidence in a quick recovery (i.e. postponing the go-around decision when parameters are converging toward target values);
2. Overconfidence because of a long and dry runway and/or a low gross-weight, although airspeed and/or vertical speed are excessive;
3. Inadequate readiness or lack of commitment to conduct a go-around;
4. Go-around envisaged but not initiated because the approach was considered being compatible with a safe landing;
5. Absence of decision due to fatigue or workload (i.e. failure to remember the applicable excessive deviation criteria).

A change of mindset should take place from ‘We will land unless …’ to ‘Let’s be prepared for a go-around and we will land if the approach is stabilised and if we have sufficient visual references to make a safe approach and landing’.

2.8 Approach, landing preparation and briefing procedures

► *Refer to the Standard Operating Procedures Manual Section 2-07 – Normal checklist: Approach and before landing*
► *Refer to the Standard Operating Procedures Manual Section 2-37 – Detailed normal procedures: Approach*
► *Refer to the Standard Operating Procedures Manual Section 2-41 – Detailed normal procedures: Before landing*
► *Refer to the Standard Operating Procedures Manual Section 3-35 – Approach*

2.8.1 Monitoring

Both Flight Crew Members shall monitor all instruments for warning flags during the approach. Any instrument showing a warning flag shall be brought to the attention of the other Flight Crew Member.

2.8.2 Uncertainty

If at any time during the approach, there is a disagreement between Flight Crew Members on course, heading, altitude, position, procedures or configuration, a missed approach shall be initiated. Any discrepancies between Flight Crew Members or instruments shall be resolved at a safe level.

2.8.3 Approach, landing and go-around briefing

The approach, landing and go-around briefings should cover the following generic aspects of the approach and landing, including a possible missed approach and a second approach or diversion:

1. Aircraft status,
2. Fuel status,
3. ATIS and weather,
4. NOTAM’s,
5. Receiver autonomous integrity monitoring (RAIM) availability (if required);
6. Landing distance at time of arrival (LDTA);
7. Top of descent,
8. Appropriate aerodrome charts,
9. Use of automation,
10. Use of aircraft systems,
11. Landing and stopping,
12. Taxi to gate or stand,
13. Go-around,
14. Alternate,
15. Use of EFB and/or IFIS system;
16. ‘TWO-C’ threats.

The approach checklist shall not be commenced before receiving an ATC clearance descending to a QNH altitude or QFE height. As part of the approach checklist or prior to the approach checklist, an altimeter check shall be performed.

2.8.4 Stabilised approach

CAT.OP.MPA.115 (a) AMC1, CAT.OP.MPA.115 AMC1, CAT.OP.MPA.115 AMC3, CAT.OP.MPA.310

► *Refer to the Operations Manual Part A Section **8.1.3.9 – Continuous descent final approach operations***

All flights shall be stabilised not later than 1.000 ft above aerodrome elevation without visual reference to the ground and 500 ft above aerodrome elevation with visual reference to the ground. An approach is considered stabilised when all of the following criteria are met:

1. The aircraft is on the required approach path and profile with the correct track set, approach aids tuned and identified as appropriate to the approach type flown and on the required vertical profile;
2. Only small changes in heading and pitch are required to maintain the correct flight path. The bank angle shall be less than 30 degrees;

NOTE

A final turn towards the runway with visual reference to the ground (i.e. circling operations) shall not be considered as unstable if properly briefed.

3. The aircraft speed is not more than V_{ref} + 20 and not less than V_{ref};

NOTE

Some approaches especially at busier aerodromes require a higher approach speed than V_{ref} + 20 until a certain distance (e.g. 160 KIAS until 4 DME at EDDF). A speed higher than V_{ref} + 20 shall not be considered as unstable if properly briefed.

4. Correct configuration for the stage of approach is set;
5. Rate of descent shall not exceed 1.000 ft/min or 300 ft/min above the rate of descent needed to fly the applicable approach, whichever is greater;

NOTE

If an approach requires a rate of descent greater than 1.000 ft/min (e.g. steep approach procedure), this rate of descent shall not be considered unstable if properly briefed. Zero rate of descent may be used when the descent path needs to be regained from below the profile.

6. Thrust and trim settings are appropriate for the aircraft configuration;
7. All briefings and checklists have been completed;

NOTE

The checklist items related to autopilot / yaw damper and landing lights part of the before landing checklist shall not be required to be completed to meet the stable criteria.

8. ILS approaches are flown within half full-scale deflection of the localizer and on or up to half full-scale deflection above the glideslope. Conventional non-precision approaches are flown within half full-scale deflection for a VOR approach and within 5° of the required bearing for a NDB approach. RNP APCH procedures are flown within half full-scale deflection of the defined lateral path and, if applicable, on or up to half full-scale deflection above the vertically defined path. In the case of circling approaches flown after a CDFA, the aircraft shall be stabilised in the circling configuration not later than passing 1.000 ft above the runway elevation.

An approach that becomes unstabilised shall require an immediate go-around.

2.8.5 Visual reference

During the approach, visual references on or near the aerodrome will become available. The following callouts related to acquiring visual references shall be used:

1. “AERODROME IN SIGHT” means when approaching the aerodrome, the PM / PF becomes visual with the aerodrome but not necessary with the actual landing runway. The PF / PM may respond with “AERODROME IN SIGHT” confirming also to be visual with the same reference or “CHECKED” indicating not to be visual yet;
2. “APPROACH LIGHTS IN SIGHT” means the PM / PF becomes visual with the approach lights (if any) of the landing runway but not necessary with the actual landing runway. The PF / PM may respond with “APPROACH LIGHTS IN SIGHT” confirming also to be visual with the same reference or “CHECKED” indicating not to be visual yet;
3. “VISUAL” means the PM / PF becomes visual with the actual landing runway and will remain so during the rest of the planned approach. The PF / PM may respond with “VISUAL” confirming also to be visual with the same reference and desiring to continue with visual approach procedures or “CHECKED” indicating not to be visual yet or wanting to continue with the applicable approach callouts;
4. “CONTINUE” means the PF is visual with the actual landing runway and has the intend to land after being authorised by ATC (if applicable) and after the PM confirmed to be visual with the actual landing runway by him announcing “VISUAL”.

Refer also to the ‘decision to land’ section below for a more elaborated procedure on the callout “CONTINUE”. Callouts such as “(INTERMITTENT) GROUND CONTACT and “LANDING” shall not be used.

2.8.6 Decision to land

The decision to land shall be announced by the PF, by making the callout “CONTINUE” at the earliest at 500 ft AAL on a VFR approach or visual / circling phase of an IFR (i.e. instrument) approach or at 500 ft above the minima on an IFR (i.e. instrument) approach without visual / circling phase.

The callout “CONTINUE” by the PF shall only be made when:

1. The landing runway is actually in his sight and will remain so during the rest of the planned approach;

NOTE

The callout “CONTINUE” may replace the callout “VISUAL” as it includes the visual prerequisites but only after the PM called “VISUAL” indicating he also has the landing runway in sight.

2. The aircraft is authorised to land (if applicable);
3. The approach is considered stable which is confirmed by the Commander (PIC) by him making the callout “STABLE”.

2.8.7 V_{app} and V_{ref}

An approach speed (V_{app}) is established to safely deal with gusty wind conditions and possible windshear during approach and landing.

The approach speed used during approach and landing is calculated based on the figures as published in the Aircraft Flight Manual corrected for the wind. The approach speed for normal operations is V_{ref} plus one-half of the steady headwind component plus the gust increment above the steady wind to the reference speed:

$$V_{app} = V_{ref} + ½ \text{ steady wind speed} + \text{gust increment}$$

The V_{app} range for normal operation is a minimum of V_{ref} + 5kt and a maximum of V_{ref} + 20 kt. When the landing is performed with V_{app} (V_{ref}+wind correction) the landing distance must be adjusted accordingly, prior arrival.
For emergency and abnormal procedures, the QRH must be followed. If the QRH procedure requires V_{ref} increments over 20 kts this speed must be set.

NOTE:

Additives for V_{app} must be kept until runway threshold.

2.9 VFR approach procedures

► *Refer to the Standard Operating Procedures Manual Section 3-35 – Visual approach*

► *Refer to the Operations Manual Part A Section **8.1.4 – Operating minima for VFR flights***

► *Refer to the Operations Manual Part B Section **2.4.5 – Altitude selector***

► *Refer to the Operations Manual Part B Section **2.11 – Visual approach and circling***

A VFR approach should be performed on a nominal 3° (5%) glideslope using visual references such as PAPI and VASI when available. The approach shall be stabilised 500 ft AAL on the correct approach path, in the landing configuration at V_{app} with the appropriate thrust applied. The autopilot should not be used and (the) flight director(s) should be turned off. Bear in mind the possible risk of optical illusions due to hindered night vision.

The speed trend indicator may help a Flight Crew Member making timely and correct thrust settings and approach path corrections.

Avoid descending through the correct approach path especially with idle thrust. Late recognition of this situation without a prompt thrust increase may lead to considerable speed decay and altitude loss. Avoid any tendency to ‘tuck under’ in the late stages of the approach. Avoid destabilizing the approach in the last 100 ft, in order to have the best chance of performing a good touchdown at the desired position.

2.10 IFR approach procedures

2.10.1 Conventional precision approach

► *Refer to the Operations Manual Part A Section **8.1.3.4 – Determination of DH / MDH for instrument approach operations***

► *Refer to the Operations Manual Part B Section **2.4.5 – Altitude selector***

► *Refer to the Operations Manual Part B Section **2.10.3 – RNP APCH operations***

2.10.1.1 General

Before arming the navigation mode ‘APPR’ the aircraft shall be cleared for the approach. It shall be noted that there is a difference between the ATC clearance “CLEARED LOCALISER” and “CLEARED APPROACH”. When instructed to intercept the localizer, the lateral navigation mode ‘LNAV’ instead of the navigation mode ‘APPR’ shall be armed.

An altitude (height) crosscheck shall be performed. The glideslope shall never be intercepted from above in between the published final approach point and the decision altitude (height). Flight Crew Members shall use all available means to confirm the glide slope validity as early in the approach as possible, for example by cross-checking the altitude (height) at glide slope interception against available DME information.

2.10.1.2 Outer marker check

On an ILS approach, the indicated altitude (height) on the glideslope when passing the outer marker or official substitute shall be compared to the officially published altitude (height). The indicated altitude (height) may differ slightly from the published altitude (height) because of temperature deviations from ISA. This outer mark check also provides a mean of validating the altimeter setting used. Any doubt about the validity of the glideslope signal or altimeter setting value requires an immediate go-around.

When passing the outer marker, the following practice shall be applied:

Table: Callouts passing the outer marker

Callouts passing the outer marker		
Situation	PF	PM
Passing the outer marker	Outer marker xxxx ft	---
PM checks the approach charts	---	Checked

2.10.1.3 Navigation set-up procedures

► *Refer to the Standard Operating Procedures Manual Section 3-35 – Instrument approaches*

2.10.2 Conventional non-precision approach

► *Refer to the Operations Manual Part A Section* ***8.1.3.4 – Determination of DH / MDH for instrument approach operations***

► *Refer to the Operations Manual Part A Section* ***8.1.3.9 – Continuous descent final approach operations***

► *Refer to the Operations Manual Part B Section* ***2.4.5 – Altitude selector***

► *Refer to the Operations Manual Part B Section* ***2.10.3 – RNP APCH operations***

2.10.2.1 General

Non-precision approaches (NPA) shall be flown closely following a continuous descent profile (CDFA).

The aim of a CDFA procedure is to minimise the vertical manoeuvring required while flying the final approach segment to landing. The goal is to achieve a continuous final approach descent path that approximates that of a normal glide path. The descent angle flown ensures that minimum FAF crossing altitude (height) and any step-down altitudes (heights) between the FAF and the MAP are respected. The aircraft is descended towards a DA(H) / MDA(H) until the required visual references are obtained and the descent continued to landing or until the DA(H) / MDA(H) is reached where the missed approach is commenced.

The procedure shall be flown as a stabilised approach in order to achieve a constant angle descent to 50 ft over the threshold. A stabilised approach shall never have any level segment of flight at DA(H) / MDA(H). Flight Crew Members shall not descend below DA(H) / MDA(H) unless the required visual references as stated are distinctly visible mandating a prompt go-around manoeuvre at DA(H) / MDA(H) if not.

Make full use of the ground speed information during final approach. On a 3° descent profile (5% slope), the required rate of descent is approximately equal to 5 times the ground speed (rule of thumb).

A go-around is mandatory whenever the aircraft is in a position from which a safe landing may not be performed. Due consideration shall be given to landing performance requirements. It is mandatory to over-fly the published missed approach point before flying the missed approach track.

When performing an FMS coupled approach to fly a conventional NPA approach, the procedure shall be monitored with reference to the conventional navigation aid associated with the procedure.

2.10.2.2 Altimeter procedures

As the pressure altimeter is used for DA(H) determination, an altimeter check shall be performed. This check shall be performed normally before commencing (or during) the approach checklist but not later than at 1.000 ft AAL.

All available published navigational aids such as DME fixes, radials, bearings or radar fixes shall be used to determine the descent profile.

Where one or more step down fixes are part of the approach procedure, adjust the rate of descent so as to cross the step-down fix at or slightly above the published altitude (height). Obviously, avoiding one or more level off shall make flight path and speed control much easier.

The PM shall inform the PF about the target altitude (height) at each specific check point of the published descent profile.

The rate of descent during non-precision approaches shall never exceed 1.000 ft per minute.

2.10.2.3 Navigation set-up procedures

► *Refer to the Standard Operating Procedures Manual Section 3-35 – Instrument approaches*

2.10.2.4 Approach callout procedures

When performing non-precision approaches with autopilot and flight director, good crew coordination is of the utmost importance during the follow-up to ensure correct final aircraft alignment, safe obstacle margins and adequate descent profile. Aircraft should be in landing configuration before leaving the final altitude (height) for the DA(H).

During the final descent, the PM reads the altitude (height) versus distance to verify if the aircraft is correctly established on profile. If necessary, the PF corrects the rate of descent with the VS knob on the flight guidance control panel. Each altitude (height) announcement shall be acknowledged by the PF.

In case of a step-down procedure where the aircraft reaches the altitude (height) before the associated DME distance, the ALT mode shall be used until descent can be resumed towards next step-down or DA(H).

During the approach, the PF flies the aircraft and monitors closely speed and rate of descent. As the workload during a non-precision approach is very high, the PM monitors the parameters, particularly the aircraft speed, announcing aloud and clearly any deviation.

2.10.3 RNP APCH operations

► Refer to the Operations Manual Part A Section **8.3.2.2.9 – RNP APCH general operational procedures**

► Refer to the Operations Manual Part B Section **2.4.5 – Altitude selector**

► Refer to the Operations Manual Part B Section **2.19 – Performance-based navigation**

► Refer to the Minimum Equipment List (MEL) Section I.3.2.3 – Performance-based navigation operation

This section contains the aircraft specific performance-based navigation (PBN) operational procedures. The general procedures shall be depicted in the relevant sections of the OM Part A as detailed in the references above. The criteria for dispatch shall be detailed in the minimum aircraft system performance specifications (MASPS) part of the MEL.

Performance-based navigation (PBN) operational procedures shall require a Company operational approval prior to operating. Every Flight Crew Member shall ensure that his currency to perform as such is still valid.

2.10.3.1 Aircraft specific procedures and limitations for NPA GNSS, APV BARO, SBAS APV and SBAS CAT I approach

Both Flight Crew Members shall confirm, before approaching the FAF, that the applicable PFD indicates (white steady message) the applicable approach mode (LPV, APPR, etc) and that a magenta snowflake is indicating in case of an LPV or LNAV/VNAV approach. Approaching the FAF without a steady white approach mode indication and a magenta snowflake on the applicable PFD (required on both sides) prohibits the approach procedure beyond the FAF and shall require a go-around.

2.10.3.2 NPA GNSS approach additional specific procedures and limitations

NPA GNSS approaches shall be flown closely following a continuous descent profile (CDFA).

The aim of a CDFA procedure is to minimise the vertical manoeuvring required while flying the final approach segment to landing. The goal is to achieve a continuous final approach descent path that approximates that of a normal glide path. The descent angle flown ensures that minimum FAF crossing altitude (height) and any step-down altitudes (heights) between the FAF and the MAP are respected. The aircraft is descended towards a DA(H) / MDA(H) until the required visual references are obtained and the descent continued to landing or until the DA(H) / MDA(H) is reached where the missed approach is commenced.

The procedure shall be flown as a stabilised approach in order to achieve a constant angle descent to 50 ft over the threshold. A stabilised approach shall never have any level segment of flight at DA(H) / MDA(H). Flight Crew Members shall not descend below DA(H) / MDA(H) unless the required visual references as stated are distinctly visible mandating a prompt go-around manoeuvre at DA(H) / MDA(H) if not.

Make full use of the ground speed information during final approach. On a 3° descent profile (5% slope), the required rate of descent is approximately equal to 5 times the ground speed (rule of thumb).

A go-around is mandatory whenever the aircraft is in a position from which a safe landing may not be performed. Due consideration shall be given to landing performance requirements. It is mandatory to over-fly the published missed approach point before flying the missed approach track.

2.10.3.3 APV BARO additional specific approach procedures and limitations

The following additional specific APV BARO approach procedures and limitations shall apply:

1. For VNAV operations, the use of FD shall be required.
2. Use of VNAV vertical guidance shall be prohibited when the barometric altitude is corrected to the landing field elevation (i.e. QFE operation);
3. APPR mode shall be armed (APPR mode selected and magenta APPR RNP indication displayed) at least 2 NM prior to the FAF;
4. Barometric vertical navigation is prohibited at aerodromes with remote altimeter setting;
5. When the reported station temperature exceeds the limits published in the approach chart, the use of VNAV barometric procedures are prohibited unless the pilot uses the VNAV temperature compensation function.

2.10.3.4 SBAS APV and SBAS CAT I additional specific approach procedures and limitations

The following additional specific SBAS APV and SBAS CAT I approach procedures and limitations shall apply:

1. APPR mode shall be armed (APPR mode selected and magenta APPR LPV indication displayed) at least 2 NM prior to the FAF;
2. For LPV operations, dual GPS shall be required.

2.10.3.5 Navigation set-up procedures

► *Refer to the Standard Operating Procedures Manual Section 3-35 – Instrument approaches*

2.10.3.6 Approach callout procedures

On an NPA GNSS approach during the final descent, the PM reads the altitude (height) versus distance to verify if the aircraft is correctly established on profile. If necessary, the PF corrects the rate of descent with the flight path angle (FPA) on the flight guidance control panel. Each altitude (height) announcement shall be acknowledged by the PF. Aircraft should be in landing configuration before leaving the final altitude (height) for the DA(H).

2.11 Visual approach and circling

► *Refer to the Standard Operating Procedures Manual Section 3-35 – Circling approach and visual approach*

► *Refer to the Operations Manual Part A Section **8.1.3.5 – Circling operations***

► *Refer to the Operations Manual Part B Section **2.4.5 - Altitude selector***

► *Refer to the Operations Manual Part B Section **2.9 - VFR approach procedures***

2.11.1 Visual approach

A visual approach is an approach when either part or all of an instrument approach procedure is not completed and the approach is executed with visual reference to the terrain. An IFR flight may be cleared for a visual approach provided both Flight Crew Members have the aerodrome in sight, can maintain visual reference to the terrain and:

1. The reported ceiling is not below the initial approach level for the aircraft so cleared; or
2. The Commander (PIC) reports at the initial approach level or at any time during the instrument approach that the visibility will permit a visual approach and he has the aerodrome in sight at all times.

When in controlled airspace, ATC shall provide separation between an aircraft cleared for visual approach and other departing or arriving traffic.

No visual approach shall be conducted if the correct position of the aircraft towards the runway is not known during the approach. The approach shall be stabilised 500 ft AAL on the correct approach path, in the landing configuration at V_{app} with the appropriate thrust applied. Bear in mind the possible risk of optical illusions due to hindered night vision.

Be aware that visual approaches may be radar vectored initially.

Even more than during other phases of flight, a visual approach demands an extensive look out for other traffic. Regularly scan the runway. For the go-around routing, check ATC requirements.

2.11.2 Circling approach

A circling approach is the visual phase of an instrument approach to bring an aircraft into position for landing on a runway, which is not suitably located for a straight-in approach. Whenever straight in landing (runway aligned within 30° of the final approach course) is not possible, a circling approach shall be required.

When no circle to land minima are published for the approaching aerodrome, the manoeuvre is not authorised (unless in VMC conditions). If a landing on a non-instrument approach runway is required, use the visual approach criteria.

Use the following guidelines when making a circling approach:

1. Workload is very high and therefore the approach and initial maneuvering shall be made using the autopilot. The PF shall control and monitor the approach visually. The PM shall monitor engine parameters, speeds and altitudes (heights);
2. The aircraft shall circle with the aircraft in landing configuration, except for the final flap setting. If workload to maintain visual becomes too high, the PF may request the PM to adjust the thrust levers as required so as to maintain a constant (pre-briefed) speed;
3. Maintain the applicable minima until the aircraft is in a position from which a normal descent (< 1.000 ft/min) can be made to touchdown within the touchdown zone. It is advisable to maintain this altitude (height) until 30° off centerline;
4. Study the obstacles present in the circling area. Study carefully how and when to break off and the possible go-around routing(s);
5. Be sure you co-ordinate with ATC on the direction of the procedure;
6. During the circling, stay visual. Do not overshoot the runway axis on final. When descending below the minima, all obstacle protection is lost;
7. Perform the complete instrument approach preceding the circling manoeuvre as published. If an ILS is flown before circling, level off at the circling minima, keep tracking the LOC. If not visual, a go-around shall be required at the missed approach point of the LOC/GS out procedure. This can be confusing, as the ILS is flown with the minima of the circling approach and the missed approach point of the LOC/GS out procedure;
8. Do not break off too soon when becoming visual. Make sure you are within the protected area. Prefer a downwind on the PF side;
9. If crosswind exceeds 10 Kts, prefer to circle to the downwind side of the landing runway;
10. Descent below the minima only if the landing threshold is in sight, obstacles can be cleared visually and if on profile for final descent. If an approach is misjudged or visual reference with the runway is lost, execute the missed approach without delay. Turn towards the instrument runway on which the approach has been made and coordinate with ATC.

2.11.3 Contact approach

As a Company policy, the cancellation of an established instrument approach and the continuation of the flight in minimal VMC without the aerodrome in sight shall not be allowed.

2.12 Missed approach

► *Refer to the Standard Operating Procedures Manual Section 2-42 – Detailed normal procedures: Go-around*

► *Refer to the Standard Operating Procedures Manual Section 3-40 – Rejected landing*

► *Refer to the Operations Manual Part B Section **2.8.4 – Stabilised approach***

2.12.1 Go-around procedure

There is no negative interpretation made in assessing a Flight Crew Member's decision to initiate a go-around. When cleared for approach, a flight is also cleared for a go-around. Do not delay that decision!

CAUTION

An approach that is unstable or becomes unstable shall require an immediate go-around.

If a go-around has been executed for meteorological reasons, another approach shall only be commenced if the Commander (PIC) has reasons to believe that a second approach shall lead to a successful landing.

More than two approaches shall only be made if attempting a third approach would be safer than diverting to an alternate aerodrome.

The moment the "GOING AROUND" is announced by the PF or PM, the missed approach procedure shall be commenced in accordance with the requirements for the approach being flown or as directed by ATC.

Once the missed approach has been initiated, it shall be flown regardless of whether or not the runway environment subsequently becomes visible.

If a turning missed approach is required, execute the pull up and wait for gear up before initiating the turn. Limit the bank angle to 15 degrees until accelerating through V_2 + 10.

2.12.2 Balked landing procedure

2.12.2.1 General

A balked landing is a landing that is discontinued after the decision to land has been made.

2.12.2.2 Before touchdown

In the absence of procedures for a balked landing, the procedures for a missed approach shall be followed.

Some aerodromes may have different ATC procedures for a missed approach or a balked landing. The crew shall be familiar with both before commencing the approach.

2.12.2.3 After touchdown

After touchdown the decision to discontinue a landing depends on many factors and is therefore not proceduralised. The decision to discontinue a landing rest solely with the Commander (PIC).

Factors to be taken into consideration for the decision to discontinue a landing are, but not limited to:

1. Flight crew proficiency (a balked landing after touchdown is not a trained manoeuvre);
2. Runway length remaining (runway length remaining on most runways is not indicated);
3. Runway length required (there is no published runway length required data after touchdown);
4. Runway contamination and/or condition;
5. Non-standard landings (when a touchdown occurred too fast and/or too long down the runway then the landing data published shall not be valid anymore and determining whether or not the aircraft may come to a full stop at the end of the runway is impossible);
6. Obstacles and/or terrain in the departure area;
7. Aircraft flap setting and reverse position;
8. Current airspeed (slower airspeeds require exponentially more runway to accelerate);
9. Wind condition (less headwind or more tailwind exponentially increases the runway required to accelerate again);
10. Weather (windshear, thunderstorms, icing, etc).

2.13 Normal landing

► *Refer to the Standard Operating Procedures Manual Section 2-07 – Normal checklist: Before landing*

► *Refer to the Standard Operating Procedures Manual Section 2-41 – Detailed normal procedures: Before landing*

► *Refer to the Standard Operating Procedures Manual Section 3-40 – Landing, maximum performance landing, crosswind landing and operational factors affecting landing distance*

► *Refer to the Operations Manual Part B Section **2.8.4 – Stabilised approach***

After the announcement “BEFORE LANDING CHECKLIST COMPLETED”, the PF shall give a reminder of the initial part of the missed approach.

Idle thrust approaches shall be avoided. The elevator shall be in trim throughout the whole approach so that full elevator effectiveness remains available.

As the aircraft approaches the touchdown point, reduce rate of descent and slowly reduce thrust to idle, so that engines are at idle as the aircraft touches down. Normally, a 2° to 3° pitch change shall only be required to reduce the rate of descent.

Plan to touchdown as near as possible to the 1.000 ft (300 meters) point. Do not allow the aircraft to float in ground effect, which may cause the available runway to be insufficient for landing deceleration.

As the aircraft touches down on the main gear, the nose wheel shall be controlled towards the ground whilst maintaining directional control. With Autobrake set to LO, MED or HI, after touchdown verify the normal operation of the Autobrake system and proper deceleration of the airplane. At 40 KIAS, press the brake pedals to disengage the Autobrake and use the brake pedals as required to reach a safe taxi speed.

NOTE

At the pilot's discretion, the autobrake can be disengaged after touchdown at any speed by pressing the brake pedals. To achieve maximum deceleration, manual braking should begin as soon as possible.

During the landing roll, if autobrake deceleration is not suitable for the stopping distance available, manual braking shall be used.

Pilot shall be alert for autobrake disengagement indications during the landing roll. At pilot's discretion, reverse thrust can be used with manual braking or autobrake during landing roll until a safe speed is reached.

Upon landing, maximum thrust reverser deployment shall always be performed with simultaneous brake application. Whereas, idle thrust reverser deployment may be performed without brake application during initial airplane deceleration, provided that the runway distance available allows the airplane safe deceleration.

CAUTION

Autobrake shall be set to OFF for emergency and abnormal procedures.

Note that the following conditions increase the required landing distance:

1. Delay in selecting reverse thrust;
2. Delay in the application of braking;
3. Speed above V_{ref} over the threshold;
4. Floating above the runway (extended flare);
5. Arriving too high over the threshold;
6. A flat approach path (less than 3°);
7. Wet and contaminated runways;
8. Landing with a tailwind.

2.14 Post landing procedures

► *Refer to the Standard Operating Procedures Manual Section 2-07 – Normal checklist: After landing, shutdown and leaving the airplane*

► *Refer to the Standard Operating Procedures Manual Section 2-45 – Detailed normal procedures: After landing, shutdown and leaving the airplane*

► *Refer to the Operations Manual Part A Section* ***8.2.2 – Aircraft, Passengers, Task Specialist and cargo handling procedures related to safety***

The first priority on the ground shall always be a good lookout. Do not perform any task unless you know where you are and where you are going.

Switches or levers should only be moved after the aircraft has cleared the active runway.

STROBE / RED BCN lights shall remain on and the 'after landing checklist' shall not be performed until the active runway has been vacated.

CAUTION

Taxiing with only one engine running (i.e. single-engine taxi) shall not be allowed.

After the shutting down of the engines, the shutdown checklist shall be completed. The after- flight paperwork should only be done when stationary with engines shut down.

CAUTION

Observe any engine operating minimum time restriction at idle thrust before shutting down the engines.

The following task sharing procedures shall be applicable:

Table: Task sharing after landing

Task sharing after landing						
Item	**CMDR (PIC)**	**SIC**	**CM1**	**CM2**	**PF**	**PM**
Taxi					X	
Clean-up						X
CPDLC logoff						X

As soon as the aircraft is stationary on the apron, the transponder shall be put in STBY mode.

After the shutting down of the engines, the shutdown checklist shall be completed. The afterflight paperwork should only be done when parked with engines shut down.

Table: Task sharing during and after shutdown

Task sharing during and after shutdown						
Item	**CMDR (PIC)**	**SIC**	**CM1**	**CM2**	**PF**	**PM**
Engine shut down					X	
Passenger disembarkation and luggage	X					
Reports	X					
APU				X		
EFB (charging, updating and restowing)		X				
Note: If required, an EFB may be charged and updated in a safe place outside of the aircraft.						

Disembarkation shall not commence until the Commander (PIC) has given clearance to do so. Disembarkation shall not commence until the crew has confirmed that the passenger steps are safely in position. Passengers shall not be allowed to disembark the aircraft without at least one Flight Crew Member present. The Commander (PIC) opens the cabin door and is the first person to leave the aircraft in order to assist disembarking the passengers. It's his responsibility to keep the passengers together. In case there is no handling agent present he shall escort the passengers to the terminal in a safe way.

On completion of duty or overnight, the aircraft shall be left with the parking brake off, blocks installed, APU shut down, all electrical switches and lights turned off. Indicate clearly to any Ground Personnel that the aircraft may be moved or not preferably by placing a placard in front of the left-hand windshield indicating any possible towing limitation (e.g. parking brake set, STEERING DISENGAGE, etc).

NOTE

Avoid setting the parking brake when the brakes are hot from severe usage or when moisture conditions and/or freezing conditions may form ice locks.

The parking brake should be left off and wheel chocks installed when the aircraft is left unattended. Changes in the ambient may cause the brakes to release or to exert excessive pressure.

The main cabin door shall be locked, the emergency exit secured and all necessary cleaning done unless Company arrangements have been made with the applicable FBO to leave the aircraft open for later servicing.

All pitot covers and engine covers shall be fitted to the aircraft after final shutdown when the aircraft stays overnight or the aircraft is left for pick-up by another crew.

2.15 Operation on wet and contaminated runways

► *Refer to the Standard Operating Procedures Manual Section 3-10 – Taxi under adverse weather*

► *Refer to the Standard Operating Procedures Manual Section 3-15 – Take-off in adverse conditions*

► *Refer to the Standard Operating Procedures Manual Section 3-40 – Landing on wet, slippery or contaminated runways*

► *Refer to Section **1 – Limitations***

Use the following guidelines when making a departure or landing on a wet or contaminated runway:

1. Take-off and landing on contaminated runways shall not be attempted in tailwind conditions;
2. Landing on wet runways is not recommended in tailwind conditions;
3. Performance credit shall not be assumed for reported headwinds exceeding 10 knots;
4. An aircraft shall not depart if ice, wet snow or frost could develop during taxiing. On slippery taxiways and aprons, extreme caution shall be exercised. Use taxi speeds consistent with the prevailing conditions. If in doubt physically check the apron surface before deciding to taxi;
5. Runways covered for considerable proportion of their length with depths of water or slush, exceeding approximately 3 mm, may have an adverse effect on landing performance because under such conditions aquaplaning is likely to occur. Under these circumstances, a landing shall only be attempted if there is an adequate distance margin over and above the normal landing field length required;
6. Runways shall have a cleared strip width of 24,4 meters with no snowbanks or 27,4 meters with snowbanks of no more than 0,5 meters.

2.16 Steep approach operation

► *Refer to the Aircraft Flight Manual Supplement 4 – Steep approach operation*

► *Refer to the Standard Operating Procedures Manual Section 2-08 – Supplementary normal checklist: Steep approach operation*

► *Refer to the Standard Operating Procedures Manual Section 3-35 – Steep approach*

► *Refer to the Operations Manual Part A Section **1.1.5 – List of aircraft in service***

► *Refer to the Operations Manual Part A Section **8.1.2.4.14 – Steep approach operations***

► *Refer to the Operations Manual Part B Section **1.4 - Types of operation***

► *Refer to the Operations Manual Part C Section **5.2 – Steep approach procedures***

This section contains the aircraft specific steep approach operational procedures. The general procedures shall be depicted in the relevant sections of the OM Part A as detailed in the references above.

For aircraft listed on the Company's Air Operator Certificate (AOC), steep approach operations shall require an approval from the Competent Authority prior to operating. Every Flight Crew Member shall ensure that his currency to perform as such is still valid.

For aircraft listed on the Company's Declaration (DEC), steep approach operations shall require a Company operational approval prior to operating. Every Flight Crew Member shall ensure that his currency to perform as such is still valid.

NOTE

A steep approach procedure is an approach procedure using glideslope angles of 4,5° or more and with screen heights of less than 60 ft, but not less than 35 ft.

2.17 NAT HLA MNPS operation

SPA.MNPS.100, SPA.MNPS.105

► *Refer to the Operations Manual Part A Section **1.1.5 – List of aircraft in service***

► *Refer to the Operations Manual Part A Section **8.3.2.3 – NAT HLA MNPS procedures***

► *Refer to the Operations Manual Part A Annex 18 – Company oceanic operation (NAT HLA MNPS) checklist*

► *Refer to the Operations Manual Part B Section **1.4 – Types of operation***

► *Refer to the Operations Manual Part B Annex 1 - Supplementary Company checklist E545 / E550*

► *Refer to the Minimum Equipment List (MEL) Section I.3.2.1 – RNP 4 / RNAV 10 NAT HLA MNPS and remote airspace operation*

This section contains the aircraft specific NAT HLA MNPS operational procedures. The general procedures shall be depicted in the relevant sections of the OM Part A as detailed in the references above. The criteria for dispatch shall be detailed in the minimum aircraft system performance specifications (MASPS) part of the MEL.

NAT HLA MNPS operations shall require a specific approval from the Competent Authority prior to operating. Every Flight Crew Member shall ensure that his currency to perform as such is still valid.

NOTE

No aircraft specific operational procedures required for this type of aircraft besides the procedures already depicted in the OM Part A and OM Part B as mentioned in the references above.

2.18 RVSM operation

SPA.RVSM.100, SPA.RVSM.115

► *Refer to the Standard Operating Procedures Manual Section 3-25 – RVSM*

► *Refer to the Operations Manual Part A Section **1.1.5 – List of aircraft in service***

► *Refer to the Operations Manual Part A Section **8.3.2.4 – RVSM operation***

► *Refer to the Operations Manual Part A Annex 12 – RVSM trend monitoring sheet*

► *Refer to the Operations Manual Part B Section **1.4 - Types of operation***

► *Refer to the Operations Manual Part B Annex 1 - Supplementary Company checklist E545 / E550*

► *Refer to the Minimum Equipment List (MEL) Section I.3.2.2 – RVSM operation*

This section contains the aircraft specific RVSM operational procedures. The general procedures shall be depicted in the relevant sections of the OM Part A as detailed in the references above. The criteria for dispatch shall be detailed in the minimum aircraft system performance specifications (MASPS) part of the MEL.

RVSM operations shall require a specific approval from the Competent Authority prior to operating. Every Flight Crew Member shall ensure that his currency to perform as such is still valid.

NOTE

No aircraft specific operational procedures required for this type of aircraft besides the procedures already depicted in the OM Part A and OM Part B as mentioned in the references above.

2.19 Performance-based navigation

CAT.OP.MPA.126 AMC1

► *Refer to the Operations Manual Part A Section **1.1.5 – List of aircraft in service***

► *Refer to the Operations Manual Part A Section **8.3.2.2 – Performance-based navigation***

► *Refer to the Operations Manual Part B Section **1.4 - Types of operation***

► *Refer to the Operations Manual Part B Section **2.10.3 - RNP APCH operations***

► *Refer to the Operations Manual Part B Annex 1 - Supplementary Company checklist E545 / E550*

► *Refer to the Minimum Equipment List (MEL) Section I.3.2.3 – Performance-based navigation operation*

This section contains the aircraft specific performance-based navigation (PBN) operational procedures. The general procedures shall be depicted in the relevant sections of the OM Part A as detailed in the references above. The criteria for dispatch shall be detailed in the minimum aircraft system performance specifications (MASPS) part of the MEL.

Performance-based navigation (PBN) operational procedures shall require a Company operational approval prior to operating. Every Flight Crew Member shall ensure that his currency to perform as such is still valid.

NOTE

*Aircraft specific operational procedures required for this type of aircraft are detailed in section **2.10.3 - RNP APCH operations** of this manual.*

2.20 ETOPS operation

CAT.OP.MPA.140

► *Refer to the Airplane Operations Manual Volume 2 Section 6-35 - 120-minute operation with one engine inoperative*

► *Refer to the Operations Manual Part A Section **1.1.5 – List of aircraft in service***

► *Refer to the Operations Manual Part A Section **8.5 - ETOPS***

► *Refer to the Operations Manual Part B Section **1.4 – Types of operation***

► *Refer to the Operations Manual Part B Section **10.1.12 – Life raft***

CAUTION

The Company is not approved to operate this type of aircraft, in commercial air transport (CAT) operations, over a route that contains a point further from an adequate aerodrome, under standard conditions in still air, the distance flown in 120 minutes at the one engine inoperative (OEI) cruise speed as determined by the Company as an average for this purpose being 328 KTAS or a total distance of 656 NM for this type of aircraft.

2.21 QFE altimeter setting and metric units operation procedures

► *Refer to the Operations Manual Part A Section **1.1.5 – List of aircraft in service***

► *Refer to the Operations Manual Part A Section **8.3.3 – Altimeter setting procedures***

► *Refer to the Operations Manual Part B Section **2.4 – Altimeter setting and checking procedures***

QFE altimeter setting and metric unit operations shall require a Company operational approval prior to operating. Every Flight Crew Member shall ensure that his currency to perform as such is still valid.

2.21.1 General

The Company shall operate QFE as the primary altimeter setting when the country uses QFE as their primary altimeter setting.

QFE altimetry is normally used in conjunction with the metric systems (heights are given in meters instead of feet). QFE uses the elevation of the aerodrome as the zero reference line instead of MSL. As a result, the altimeters on the ground read zero and not the field elevation.

WARNING

The use of VNAV vertical guidance (except LPV) shall be prohibited when QFE is used as pressure setting.

2.21.2 QFE procedures

Normal crew briefings shall include a discussion of these procedures.

Verify with ATC the QFE altimeter setting. Verify with ATC that vertical clearances are referred to QFE.

Below transition level, altimeters shall be set to QFE with the stand-by altimeter to QNH. Above transition height, all altimeters shall be set to QNE (1013,2 hPa). All altimeters shall be crosschecked for correct setting and reading.

2.21.3 Metric operation procedures

Meters shall be used as the aircraft is capable of selecting meters. If the aircraft is however not capable of selecting meters, than conversion to feet is required according to the table as depicted below.

Table: Metric conversion table

Metric conversion table			
Meters	Feet	Meters	Feet
100	300	5.400	17.700
200	700	5.700	18.700
300	1.000	6.000	19.700
400	1.300	6.300	20.700
500	1.600	6.600	21.700
600	2.000	6.900	22.600
900	3.000	7.200	23.600
1.200	3.900	7.500	24.600
1.500	4.900	7.800	25.600
1.800	5.900	8.100	26.600
2.100	6.900	8.600	28.200
2.400	7.900	9.100	29.900
2.700	8.900	9.600	31.500
3.000	9.800	10.100	33.100
3.300	10.800	10.600	34.800
3.600	11.800	11.100	36.400
3.900	12.800	11.600	38.100
4.200	13.800	12.100	39.700
4.500	14.800	13.100	43.000
4.800	15.700	14.100	46.300
5.100	16.700	15.100	49.500

For the departure and approach part of the flight, Jeppesen charts normally have a conversion table on the applicable plate showing the normal ATC altitude assignments used.

2.22 Low visibility operation

SPA.LVO.105 (c) AMC2, SPA.LVO.125

► *Refer to the Standard Operating Procedures Manual Section 3-35 – Low visibility operations*

► *Refer to the Standard Operating Procedures Manual Section 3-40 – Low visibility landing*

► *Refer to the Operations Manual Part A Section **1.1.5 – List of aircraft in service***

► *Refer to the Operations Manual Part A Section **8.1.3.3 – Take-off minima***

► *Refer to the Operations Manual Part A Section **8.2.10 – Low visibility taxi operations***

► *Refer to the Operations Manual Part A Section **8.4.3 – Low visibility operations***

► *Refer to the Operations Manual Part B Section **1.4 - Types of operation***

This section contains the aircraft specific low visibilty take-off operations (LVTO) operational procedures. The general procedures shall be depicted in the relevant sections of the OM Part A as detailed in the references above. For this aircraft type no special criteria for dispatch are applicable for low visibilty take-off operation (LVTO) and hence no minimum aircraft system performance specifications (MASPS) are depicted in the MEL.

Low visibility take-off operations shall require a specific approval from the Competent Authority prior to operating. Other low visibility operations, which also require approval from the Competent Authority shall not be authorised. Every Flight Crew Member shall ensure that his currency to perform as such is still valid.

NOTE

No aircraft specific operational procedures required for this type of aircraft besides the procedures already depicted in the OM Part A and OM Part B as mentioned in the references above. No minimum aircraft system performance specifications (MASPS) depicted in the applicable MEL as not required for low visibilty take-off operations (LVTO).

2.23 Cold weather operation

CAT.OP.MPA.250 (b), CAT.OP.MPA.255 (a)

► *Refer to the Airplane Operations Manual Volume 1 Section 3-41 - Operation in Icing Conditions*

► *Refer to the Standard Operating Procedures Manual Section 2-75 – Detailed normal procedures: Ice conditions, cold weather and cold soak*

► *Refer to the Standard Operating Procedures Manual Section 3-10 – Engine start: Icing, cold weather and cold soak conditions*

► *Refer to the Standard Operating Procedures Manual Section 3-30 – Ice condition*

► *Refer to the Operations Manual Part A Section **8.2.4 – De-icing and anti-icing on the ground***

► *Refer to the Operations Manual Part B Section **1.13 - Limitations on wet or contaminated runways***

► *Refer to the Operations Manual Part B Section **1.14 – Airframe contamination***

2.23.1 General

The problems associated with the operation of the aircraft in a low temperature environment may be minimised and a high standard of ground and flight safety may be maintained by following the precautions, practices and procedures as set out in this section.

After a prolonged exposure to ambient temperatures below -10°C (+14°F), extra operational procedures shall be required before operating the aircraft. Refer to the cold weather operations as described in the normal procedures of the Airplane Flight Manual.

2.23.2 Pre-flight inspection procedure

In addition to the normal exterior pre-flight inspection, special attention shall be given to all vents, openings, control surfaces, hinge points, stall warning vane and the wing, tail and fuselage surfaces for accumulations of ice and/or snow. Removal of these accumulations shall be necessary prior to take-off.

The engine fan blades shall be inspected for ice and/or snow. Unless engine inlet and exhaust covers have been installed during snow and/or icing conditions, the fans shall be turned by hand in the direction of normal rotation to make sure they are free to rotate prior to starting the engines.

The removal of frozen deposits by chipping or scraping shall not be approved. A soft brush or mop may however be used to clear snow that is not adhering to the surface. If the use of de- icing and/or anti-icing fluids are required to produce a clean aircraft, special attention shall be given to ensure that the pitot masts, static ports, fuel vents, stall warning vane, cockpit windows and the area forward of the cockpit windows are free of any de-icing and/or anti-icing solution.

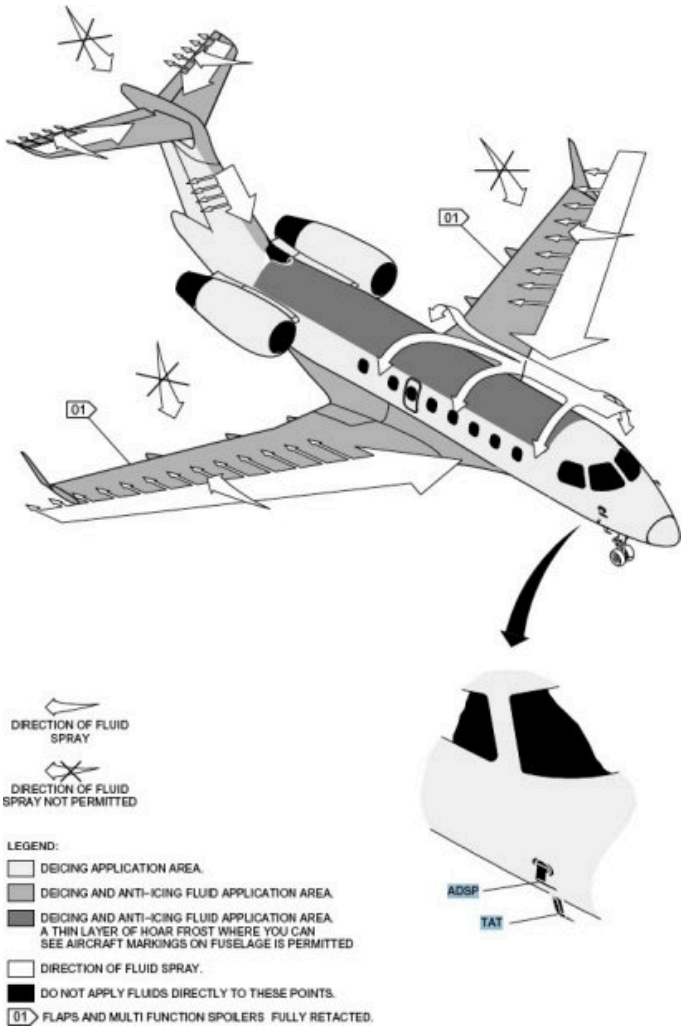
2.23.3 Ground de-ice and anti-ice procedures

Flight Crew Members shall be responsible for ensuring that the aircraft is free of ice and/or other contamination prior to operating the aircraft.

Section 3 of the Airplane Operations Manual gives Flight Crew Members advisory information on de-ice and anti-ice procedures. It shall be consulted by Flight Crew Members for legal holdover times when spraying the aircraft with de-ice and/or anti-ice fluids.

The figures below indicate the areas on the aircraft to be de-iced or anti-iced.

Figure: De-icing / anti-icing fluid application strategy



2.23.4 Taxi procedure

Taxiing through deep snow or slush should be avoided when possible. Snow and slush may be forced into the brake assemblies, which may cause the brakes to freeze during a prolonged hold on the ground or during the subsequent flight. Flaps shall remain retracted during taxiing to avoid throwing of snow or slush into the flap mechanisms and/or to minimise damage to flap surfaces.

2.23.5 Before take-off procedure

After completion of the normal before take-off checklist, it shall be verified that the aircraft is still free of frozen contaminants. Ensure that the runway is free from any hazards such as snowdrifts, glazed ice and ruts.

WARNING

Ice, frost or snow on top of de-icing and/or anti-icing solutions shall be considered as adhering to the aircraft. Take-off shall be prohibited.

2.23.6 Take-off procedure

Operation on runways contaminated with water, slush, snow or ice implies uncertainties with regard to runway friction and contaminant drag and therefore to the achievable performance and control of the aircraft during take-off, since the actual conditions may not completely match the assumptions on which the performance information is based.

In the case of a contaminated runway, the first option for the Commander (PIC) is to wait until the runway is cleared. If this is impracticable, he may consider a take-off, provided that he has applied the applicable performance adjustments and any further safety measures he considers justified under the prevailing conditions.

Flight Crew Members shall maintain an adequate overall level of safety whilst such operations are limited to rare occasions and all additional measures ensuring an equivalent level of safety shall be ensured. Such measures are special crew training, additional distance factoring and more restrictive wind limitations.

2.23.7 Landing procedure

Braking and steering may be less effective on contaminated runways. Hydroplaning may also occur under wet runway conditions at higher speeds. The rudder shall be used to maintain directional control until the tires make solid contact with the runway surface.

Selecting reverse thrust may effectively reduce the stopping distance on contaminated runways. However reverse thrust may cause snow or moisture to be thrown forward, temporary reducing forward visibility.

2.23.8 Precautions before leaving the aircraft in cold weather

Flight Crew Members shall comply with the post flight operational procedures as set out in the cold weather operations as described in the normal procedures of the Airplane Flight Manual.

Besides that, the crew shall ensure that:

1. Chocks are installed and the parking brake is released to minimize the possibility of the brakes freezing;
2. Install all protective covers and plugs;
3. Remove all freezable liquids from the galley;
4. Remove all EFB’s and related electronic equipment.

2.24 Automatic dependent surveillance - broadcast operation

► *Refer to the Operations Manual Part A Section **1.1.5 – List of aircraft in service***

► *Refer to the Operations Manual Part A Section **8.3.2.5 – Automatic dependent surveillance – broadcast operations***

► *Refer to the Operations Manual Part B Section **1.4 – Types of operation***

► *Refer to the Operations Manual Part B Section **2.2.5 – Transponder operations***

► *Refer to the Operations Manual Part B Annex 1 - Supplementary Company checklist E545 / E550*

► *Refer to the Minimum Equipment List Section I.3.2.4 – ADS-B operation*

This section contains the aircraft specific automatic dependent surveillance – broadcast (ADS- B) operational procedures. The general procedures shall be depicted in the relevant sections of the OM Part A as detailed in the references above. The criteria for dispatch shall be detailed in the minimum aircraft system performance specifications (MASPS) part of the MEL.

ADS-B operations shall require a Company operational approval prior to operating. Every Flight Crew Member shall ensure that his currency to perform as such is still valid.

2.24.1 Aircraft specific normal procedures

► *Refer to the Operations Manual Part B Section **2.2.5 – Transponder operations***

2.24.2 Aircraft specific contingency procedures

The transponder will automatically trigger an emergency ADS-B message when squawk codes 7500, 7600 or 7700 are entered.

NOTE

In the event of airborne failures resulting in less than the minimum equipment requirements, ATC shall be notified without delay.

2.25 Controller pilot data link communication

► *Refer to the Airplane Operations Manual Volume 3 Section 9-09 – Communication: Controller pilot data link communication (CPDLC) system*

► *Refer to the Operations Manual Part A Section **1.1.5 – List of aircraft in service***

► *Refer to the Operations Manual Part A Section **8.3.2.6 – Controller pilot data link communication***

► *Refer to the Operations Manual Part B Section **1.4 - Types of operation***

► *Refer to the Minimum Equipment List Section I.3.2.5 – CPDLC / ADS-C operation*

► *Refer to the Global Operational Data Link (GOLD) Manual (ICAO DOC 10037)*

This section contains the aircraft specific controller pilot data link communication (CPDLC) operational procedures. The general procedures shall be depicted in the relevant sections of the OM Part A as detailed in the references above. The criteria for dispatch shall be detailed in the minimum aircraft system performance specifications (MASPS) part of the MEL.

For aircraft listed on the Company's Air Operator Certificate (AOC), CPDLC operations shall require an approval from the Competent Authority prior to operating. Every Flight Crew Member shall ensure that his currency to perform as such is still valid.

For aircraft listed on the Company's Declaration (DEC), CPDLC operations shall require a Company operational approval prior to operating. Every Flight Crew Member shall ensure that his currency to perform as such is still valid.

2.25.1 Aircraft specific normal procedures

► *Refer to the Standard Operating Procedures Manual Section 3-25 – Controller to pilot data link communication*

CAUTION

The usage of CPDLC is restricted to supplementary means of communication for non time critical messages. The usage of CPDLC is restricted to cruise flight phase (above FL200) and for non-critical messaging.

All controller pilot data link communication (CPDLC) shall treated in the same manner as traditional voice communications. This implies that CPDLC and datalink communication shall be monitored by both Flight Crew Members, responses agreed and clearances cross-checked.

The Pilot Monitoring (PM) shall be responsible for operating the CPDLC application. When operating in airspace where CPDLC is required or used as standard means of communication, the PM should primarily have the CPDLC application active.

When using CPDLC, the crew shall monitor the required VHF or HF frequencies and be ready to revert to voice communication, should circumstances favour or dictate so.

2.25.2 Aircraft specific contingency procedures

The CPDLC application has an ‘EMERGENCY’ option that will allow crew to specify a PAN or MAYDAY condition to ATC and inform them of crew intentions, diversion, altitude capability etc.

Once a MAYDAY or PAN message has been downlinked, a ‘CANCEL EMER’ prompt becomes available. Selecting the CANCEL EMER message will allow transmitting a new emergency message.

2.26 specific system and/or equipment additional normal procedures

Some systems and/or equipment may require some more detailed explanation (e.g. specific and/or additional normal procedures for a certain system and/or equipment); hence they shall be detailed below if so required.

NOTE

Currently no such systems and/or equipment require such more detailed additional normal procedures.

SECTION 3 - ABNORMAL AND EMERGENCY PROCEDURES

3.0 General

ORO.GEN.110 (h)

3.0.1 Priorities

When any Flight Crew Member recognizes a non-normal situation, the Commander (PIC) designates who controls the aircraft. The first priority is to maintain control of the aircraft at all times to ensure a safe flight path.

The following procedure may be useful as a guideline to determine priorities in case of a non- normal situation:

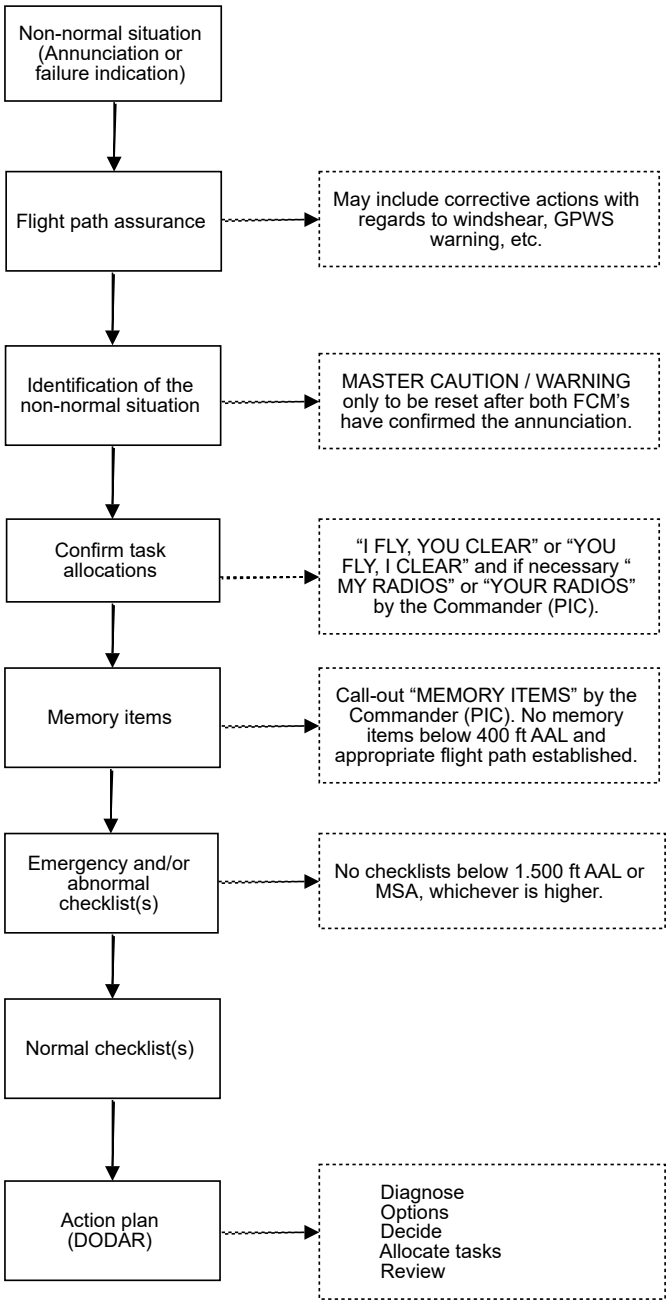
1. The first Flight Crew member to become aware of the non-normal situation shall **announce** the situation as he sees it. Master caution / warning indications shall only be reset after both Flight Crew Members have confirmed the annunciation;
2. The PF shall **fly the aircraft** to ensure a safe flight path;
3. **Navigate** the aircraft thinking about one-engine out (escape) routing, terrain, drift down and other limitations;
4. **Manage the situation** once all of the above has been assured. Abnormal or emergency procedures shall be initiated;
5. **Communicate** with the other Flight Crew Member and ATC. Use good CRM to confirm that both Flight Crew Members are fully aware of the nature of the problem. Advise ATC using a MAYDAY or PANPAN call.

The first priority shall be aircraft control. One Flight Crew Member (PF) shall fly the aircraft. The Commander (PIC) may elect either to fly the aircraft himself or to instruct the other Flight Crew Member to fly it. Assuming control of the aircraft does not relieve the Commander (PIC) of the responsibility for directing crew action.

The abnormal or emergency procedures shall be conducted as per the appropriate checklist(s) (see below). If time permits, assistance shall be sought from appropriate Company or ATC sources. Full use shall be made of all available communication systems.

A plan for subsequent action shall be prepared and briefed among the Flight Crew Members.

Figure: Action plan in case of a non-normal situation



3.0.2 Authority

The Commander (PIC) is the final authority concerning the safety, comfort and conduct of the aircraft, passenger(s) and other Flight Crew Member(s). The Commander (PIC) may and shall delay, divert or cancel any flight that cannot be conducted safely.

3.0.3 Notification

► *Refer to the Operations Manual Part A Section **12.3 – Communication procedures***

► *Refer to the Operations Manual Part B Section **3.7 – Distress communication***

The Commander (PIC) shall inform ATC or shall instruct to inform ATC (MAYDAY or PANPAN call) when an abnormal or emergency situation affects the safety of the flight.

In the event of an abnormal or emergency situation, contact the controlling agency and notify the nature of the distress and intention. If unable to contact the controlling agency, contact the emergency frequencies (121,500 MHz). If unable to contact any agency, set the transponder to 7700. If a forced or uncontrolled landing is likely, turn on the emergency locater transmitter.

3.0.4 Use of checklists

► Refer to the Manufacturer Quick Reference Handbook QRH-3924-610 Section 1 (Legacy 450) – Smoke

► Refer to the Manufacturer Quick Reference Handbook QRH-3924-310 Section 1 (Legacy 500) – Smoke

► Refer to the Manufacturer Quick Reference Handbook QRH-3924-610 Section NAP (Legacy 450) – Non-annunciated

► Refer to the Manufacturer Quick Reference Handbook QRH-3924-310 Section NAP (Legacy 500) – Non-annunciated

► Refer to the Manufacturer Quick Reference Handbook QRH-3924-610 Section EAP (Legacy 450) – Index by EICAS message

► Refer to the Manufacturer Quick Reference Handbook QRH-3924-310 Section EAP (Legacy 500) – Index by EICAS message

► Refer to the Manufacturer Quick Reference Handbook QRH-3924-610 Section QAP (Legacy 450) – Emergency evacuation

► Refer to the Manufacturer Quick Reference Handbook QRH-3924-310 Section QAP (Legacy 500) – Emergency evacuation

► Refer to the Operations Manual Part B Section **3.9 – System failures**

► Refer to the Operations Manual Part B Annex 1 – Supplementary Company checklist – E545 / E550

No single document may cover all possible abnormal or emergencies on board of an aircraft. The absolute reference is the Aircraft Flight Manual. Furthermore, the electronic checklist (ECL) or the Manufacturer's Quick Reference Handbook (QRH) shall be used on board as a mean of quick reference in handling all abnormal and emergency procedures.

Application of abnormal and emergency procedures is non-routine. All actions shall be clearly announced before being performed. Procedures requiring prompt corrective action shall be treated according to the memory action principle. The great majority of failures will allow further read and do actions, as both applied in the electronic checklist (ECL) and the Manufacturer's Quick Reference Handbook (QRH)

Certain procedures in the checklist will lead to two or more options before the procedure may be carried forward. Clear understanding of the situation and the available options shall be established between both Flight Crew Members before proceeding.

The appropriate emergency / abnormal checklist is called for by the Pilot Flying (PF) using the exact annunciation phraseology where applicable (i.e. "FUEL LOW PRESS LEFT ABNORMAL CHECKLIST"). The Pilot Monitoring (PM) will look up the correct checklist and, before performing the checklist, confirm with the Pilot Flying (PF) that he has the correct checklist (i.e. PM shows PF the checklist header while calling "CONFIRM?"). The PM then performs the checklist using the read and do principle taking the principles of critical actions (see below) into account.

NOTE

In case of multiple failures, the Commander (PIC) shall determine the order in which these failures, using the appropriate checklists, shall be performed. He shall consider possible root cause(s) causing these multiple failures and threats related to each failure and/or combination thereof.

Completion of an abnormal or emergency checklist shall be announced by the PM with the wording “XXX CHECKLIST COMPLETED”. If the emergency or abnormal checklists include a descent & approach checklist and a before landing procedure, they replace the applicable normal checklists.

If for operational reasons the Commander (PIC) deems it necessary to interrupt a procedure in the checklist before it is completed, the wording “HOLD PROCEDURE” shall be used. When ready to resume, announce “CONTINUE PROCEDURE”. Identically if certain items of a procedure may be delayed in time, the PM shall clearly announce this and state the next items to be performed.

An abnormal or emergency checklist may include procedures replacing (part of) the normal checklist(s) (i.e. single-engine approach and landing checklist replacing the normal approach and landing checklist). When performing such a checklist, it may be required to anticipate certain checklist items (i.e. manual gear extension procedure taking longer than a normal gear extension) or depicted limitations (i.e. longer runway required than planned for normal operations) before they are actually covered in the checklist. This shall be anticipated by continuing to read the abnormal or emergency checklist and by reviewing the checklist for such items and limitations to be able to brief and anticipate them well in advance.

3.0.5 Abnormal and emergency procedures

Clear crew communication is vital in case of an abnormal or emergency procedure. Upon both Flight Crew Members positively identifying the actual problem(s) by means of the EICAS and all other available cockpit indications, the crew shall silence all disturbing aural warnings.

The Commander (PIC) initiates the necessary corrective actions and task distribution. These actions shall be initiated by the call “I FLY, YOU CLEAR” or “YOU FLY, I CLEAR”. Further task distribution may include “MY RADIOS” or “YOUR RADIOS”.

No emergency / abnormal checklist(s) shall be performed before an appropriate flight path is established and the aircraft is at least 1.500 ft AAL or MSA, whichever is higher. No memory items shall be performed before an appropriate flight path is established and the aircraft is at least 400 ft AAL. Corrective actions or memory items that are required to establish an appropriate flight path (i.e. windshear, GPWS warning, etc) shall be performed without undue delay.

Some actions may have serious consequences if being performed in the wrong manner (i.e. critical actions). Therefore, and as per good CRM practice, no other actions shall be taken in meantime (i.e. no ‘split cockpit’) and the PF/PM shall monitor the PM/PF where actions shall not be taken until cross confirmation has been positively established. Typically, monitoring is mandatory when actions are required related to:

1. Thrust levers,
2. Shutting down an engine,
3. Unloading a hydraulic or electrical system;
4. Fire buttons.

Monitoring of critical actions consists out of:

1. The PF / PM places his hand on the relevant item and announces out loud the action to be performed;
2. The PM / PF confirms and if possible, guards the ‘live’ item whenever the situation permits. Cross-confirmation shall always be required.

Do not rush actions when adequate time is available for proper analysis. Good knowledge and understanding of aircraft systems and AFM procedures are essential. The action items and callouts for a monitored engine shutdown may be found below:

Table: Callouts for a monitored engine shutdown

Callouts for a monitored engine shutdown		
Situation	PF	PM
The PF places his hand on the thrust lever of the failed engine / engine required to be shut down	Confirm thrust lever N°1 to idle *or* confirm thrust lever N°2 to idle	---
The PM confirms and if possible places his hand on the thrust lever of the remaining operating engine	---	Confirmed
The PF brings the thrust lever to idle and checks the engine instruments(1)	Idle	---
The PM places his hand on the idle thrust lever	---	Confirm thrust lever N°1 to cut-off *or* confirm thrust lever N°2 to cut-off
The PF confirms whilst keeping his hand on the thrust lever of the operating engine	Confirmed	---
The PM brings the idle thrust lever to cut-off	---	Cut-off
Note 1: At any time, the PF detects an abnormal reaction of the aircraft and/or any instruments during the process of a monitored engine shutdown, he shall call "MY CONTROL" stopping the process.		

3.0.6 Task distribution

The PF shall be responsible for:

1. Control of flight path and airspeed;
2. Thrust levers of the operating engine(s) and engine(s) requiring thrust reduction (if necessary, to idle in case of a failed engine / engine requiring to be shutdown);
3. Aircraft configuration;
4. Navigation;
5. Radio communication, if handed over from the PM to the PF during abnormal or emergency management.

The PM shall be responsible for:

1. Execution of abnormal and emergency checklists using the read and do principle;

NOTE

If (part of) the abnormal or emergency checklist includes procedures replacing the normal approach and before landing checklist (e.g. single-engine approach and landing checklist), this (part of the) checklist shall be completed using the challenge and response principle.

2. Execution of actions on PF request;
3. The thrust lever brought to idle by the PF for the purpose of securing or re-starting the engine;
4. Vacating the cockpit to perform duties in the cabin related to abnormal or emergency procedures (i.e. firefighting of PED fire);
5. Monitoring the flight path.

The Commander (PIC) shall be responsible for:

1. Overall emergency or abnormal procedures handling;
2. General flight management;
3. Appropriate ATC notification;
4. Appropriate passenger notification.

If available, the autopilot should be used. However, the autopilot has not been certified in all configurations and its performance may not be guaranteed. If the autopilot is used in such circumstances, extra vigilance shall be required and it shall be disconnected if the aircraft deviates from the desired or from a safe flight path.

3.0.7 The decision-making process and problem solving

The importance of a logical, analytical decision-making process cannot be over emphasised. There are several different techniques and methods. Which method an individual uses is not as important as the ability to achieve and maintain an effective, consistent method or system of managing abnormal or emergency situations. A rushed decision without due consideration of situation and options is almost always the wrong decision.

It may be a considerable advantage to use a method that employs a mnemonic. Most systems use a mnemonic to aid the ability of an individual to recall and use it under pressure.

As a Company procedure, the mnemonic DODAR is recommended:

Table: Mnemonic DODAR explanation

Mnemonic DODAR explanation	
Diagnose	Analyse the inside and outside of the aircraft (i.e. What is the problem?).
Options	Don’t forget to consider weather, performance and fuel. Determine the risks and benefits for each option.
Decide	The Commander (PIC) decides after using and consulting all available resources.
Act / assign	Brief other Flight Crew Member(s) and passenger(s) about the decision made and assign the appropriate tasks.
Review	Inputs and/or information may change over time, hence review regularly the DODAR principle. Reviewing is possibly the most important stage and is a constant process, not solely when the actions are complete. It shall be ensured that everything is proceeding according to plan and the expected safe outcome is likely. If this is not the case, the process shall be started again to diagnose what has changed or what is not working to adopt as necessary.

3.0.8 CPDLC emergency use

► *Refer to the Operations Manual Part B Section* ***2.25.2 – Aircraft specific contingency procedures***

3.1 Crew incapacitation

► *Refer to the Standard Operating Procedures Manual Section 3-05 – Pilot incapacitation*

► *Refer to the Operations Manual Part A Section **8.3.15 – Incapacitation of Flight Crew Members***

► *Refer to the Operations Manual Part A Section **4.3 – Flight Crew incapacitation***

Since incapacitation may be either obvious or subtle, the most important measure is to maintain a high standard of alertness. Routine adherence to standard operating procedures and cockpit discipline is stressed because a procedural deviation might provide the first indication for arising problems.

A good means for detection is to follow the 'two-communication rule', any time a Flight Crew Member does not respond appropriately to any verbal request or any time a Flight Crew Member does not respond to any verbal communication associated with a significant deviation from the intended flight path, an incapacitation shall be suspected.

3.1.1 Obvious incapacitation

Obvious incapacitation means total functional failure and loss of capabilities. It will generally be an easily detectable and/or prolonged occurrence. Among the possible causes are heart disorders, severe brain disorders and severe internal bleeding. This may result from food poisoning which can occur at any location, but often in areas of poor hygiene. Food poisoning does not show its effects in a uniform manner or in a given time period.

3.1.2 Subtle incapacitation

Subtle incapacitation is considered a more significant operational hazard, because it is difficult to detect and the effects can range from partial loss of function to complete unconsciousness. Among the possible causes might be minor brain seizures, hypoglycaemia, personal problems, etc. Because a Flight Crew Member may not be aware of or capable of rationally evaluating his situation, this type of incapacitation is more dangerous.

Undue fatigue can produce very similar effects to incapacitation. The general physical capabilities are substantially reduced and may even lead to mental absences of short duration (micro sleep). These effects are also enhanced in periods of low cockpit workload. In order to counteract undue fatigue, two main points shall be considered by Flight Crew Members:

1. Coordination of sleep before and between flights;
2. Fatigue management during flight by organizing teamwork in the cockpit to allow for short recovery periods, by bright cockpit illumination or by physical movements in the cockpit.

3.1.3 Preventive measures to detect incapacitation

Routine adherence to standard operating procedures and cockpit discipline can be a great help to detect a subtle incapacitation. A procedural deviation might then provide the first indication of a problem.

The PM shall always call out any deviation from normal flight path or ATC clearance. Any time a Flight Crew Member does not respond to two clear verbal communications, an incapacitation shall be suspected.

3.1.4 Actions guidelines

In case of an incapacitation of a Flight Crew Member, the remaining Flight Crew Member shall assume immediate control of the aircraft by taking the following actions:

1. Take over the aircraft;
2. Take care of the incapacitated Flight Crew Member;
3. Prepare for landing.

Every action item is described in detail below.

3.1.4.1 Take over the aircraft

Take-over of the aircraft shall be performed by:

1. Controlling the aircraft;
2. Activating the autopilot / autothrottle in the highest level of automation;
3. Declaring an emergency (MAYDAY call).

3.1.4.2 Take care of the incapacitated Flight Crew Member

Taking care of the incapacitated Flight Crew Member depends on his situation. Assess his situation by checking his reaction to pain. By for example pinching an ear lobe it can be ascertained if the incapacitated Flight Crew Member is conscious or not.

Depending on the incapacitated Flight Crew Member being conscious or not, the tables below shall be used as they are designed as a guideline on how to assess the situation and act accordingly:

Table: Incapacitated Flight Crew Member being conscious

Conscious Flight Crew Member (positive reaction to pain)	
Assess the situation	1. Assess the situation with him. Ask him questions such as ‘What happened?’ or ‘Has this happened before?’, 2. Check if the pilot is on medication.
Secure the Flight Crew Member	1. Pull the Flight Crew Member off the controls bearing in mind the location of the control column, 2. In case of an expected heart attack, prevent any further slump by placing an arm across his chest, 3. Secure the Flight Crew Member in his seat belt, 4. Stand behind the seat; support him with one hand whilst fastening the harness with the other. Arms should be crossed under the harness straps, 5. Move the seat rearwards to the end of its travel. Ensure it locks into position and make sure feet are clear of pedals. *Note: Call for assistance from one of the passengers if necessary.*
Provide first aid	1. Apply first aid procedures accordingly. The assistance of any (medical qualified)passenger might be requested, 2. Deliver oxygen if needed, 3. Monitor his condition as his conscious level may deteriorate.

Table: Incapacitated Flight Crew Member being unconscious

<table>
<tr><th colspan="4">Unconscious Flight Crew Member (no reaction to pain)</th></tr>
<tr><th>Unable to move from his seat</th><th colspan="3">Able to move from his seat</th></tr>
<tr><td rowspan="4">1. Pull the Flight Crew Member off the controls bearing in mind the location of the control column,
2. In case of an expected heart attack, prevent any further slump by placing an arm across his chest,
3. Secure the Flight Crew Member in his seat belt, crotch strap and shoulder harness,
4. Stand behind the seat, support him with one hand whilst fastening the harness with the other. Arms should be crossed under the harness straps,
5. Move the seat rearwards to the end of its travel. Ensure it locks into position and make sure feet are clear of pedals.

Note: Call for assistance from one of the passengers if necessary.</td><td colspan="3">1. Pull the seat fully aft,
2. Recline seat back if possible,
3. Armrest up and undo seat belt,
4. Stand behind the seat, lift pilot under folded arms and carry him to the cabin to lay him on his back,
5. Check airways (A), breathing (B) and circulation (C).</td></tr>
<tr><td>No ‘B’ or ‘C’</td><td colspan="2">‘B’ and ‘C’ present</td></tr>
<tr><td rowspan="2">Perform cardiopulmonary resuscitation (CPR) and deliver oxygen.

Note: CPR is only effective if the Flight Crew Member can be removed from his seat.</td><td colspan="2">Check pulse rate and treat accordingly</td></tr>
<tr><td>If fast, suspect chock.

Note: If not possible to remove him from his seat, keep him in his seat and give oxygen.</td><td>If slow, suspect fainting.

Note: If not possible to remove him from his seat, keep him in his seat. Do not give oxygen, he will regain consciousness within 3 minutes.</td></tr>
</table>

3.1.4.3 Prepare for landing

Prepare the aircraft for landing:

1. Inform ATC of your intentions;
2. Inform the passengers to reassure them;
3. Land at the nearest suitable aerodrome.

After landing taxi to a normal, but nearest practical, ramp position.

3.1.5 Other considerations

Do not allow the incapacitated Flight Crew Member to take any further part in the conduct of the flight or series of flights, even if he feels again fully fit.

The Company shall be informed without delay regarding the circumstances of the occurrence. Any incapacitation shall be reported in writing using an occurrence report (OR).

3.2 Fire and smoke drills

► *Refer to the Aircraft Flight Manual Section 3 – Emergency procedures: Engine failure, fire or master warning during take-off, engine fire, APU fire, Cockpit / cabin smoke or fire and baggage smoke*

3.2.1 General

The applicable Manufacturer abnormal and emergency checklists cover the fire and smoke drills, which shall be executed without any undue delay. The checklists do however not cover possible causes and how to deal with fire if not part of an aircraft system (i.e. loose equipment such as PED's). This section elaborates further on the fire and smoke causes and fighting procedures in case of smoke or fire in the cockpit or cabin.

3.2.2 Definitions

For the purpose of this section, the following definitions shall be applicable:

Aggressively pursuing a fire means taking immediate action to determine the source of hot spots, smoke and/or flames. The crew shall quickly evaluate the situation, gain access to the fire and attack the fire using all available resources, which may include Able-Bodied Passengers (ABP's).

A **circuit breaker** is designed to open an electrical circuit automatically at a predetermined overload of current.

Hidden fires are fires that are not readily accessible, may be difficult to locate and are more challenging to extinguish. Some examples of hidden fires would be fires behind sidewall panelling or in overhead areas.

A **smouldering fire** is characterized by combustion without a visible flame and a slow combustion rate. A smouldering fire left unattended or a fire that has not been completely extinguished may ignite and grow into a larger uncontrollable fire in a short time.

A **suppressed fire** is a fire that has been partially extinguished which may or may not have visible flames. A suppressed fire if not extinguished, may re-establish itself and grow into a larger, uncontrollable fire in a short period of time.

3.2.3 Causes of in-flight fires

The following causes shall be considered as the most common causing fire(s) in an aircraft.

3.2.3.1 Wiring failures

A majority of hidden in-flight fires are the result of electrical arcs along wire bundles. In most cases, the electrical arc acts as the initiating event, igniting other surrounding materials. The surface of insulation materials is often a conveyer of these initiating events, as contamination from spillage, accumulated dirt/dust, lubrication or corrosion inhibitors on these surfaces can promote flame spread (uncontaminated insulation materials are generally very fire resistant). In other instances, the re-setting of a tripped circuit breaker can overheat wiring, ultimately leading to failure and arcing, causing the same chain of events.

3.2.3.2 Electrical component failure

Electrical motors may overheat, fail and possibly ignite surrounding materials. The spread of fire in these instances is often exacerbated by an accumulation of contaminants in the immediate area.

3.2.3.3 Lightning strikes

Although very infrequent, there have been instances in which a lightning strike has initiated a fire. In these instances, faulty or contaminated insulation material contributed to the fire.

3.2.3.4 Bleed air leaks

Aircraft with systems that use air from the engine (bleed air) depend on a series of pneumatic lines to deliver the air supply. A failure of any of these supply lines, if left unchecked, may cause high temperatures in the surrounding area and damage to the aircraft's equipment, wiring and associated components. High temperature bleed air leaks have been known to cause in-flight fires and structural damage.

3.2.3.5 Faulty circuit protection

A malfunctioning circuit breaker that does not open (trip) when an abnormally high current draw is detected may cause the affected unit or associated wiring to overheat and ignite.

3.2.3.6 Battery thermal runaway

Batteries are capable of ignition and subsequent explosion due to overheating. Shorting, rapid discharge or overcharging may cause this overheating. Overheating results in thermal runaway, which is a chemical reaction within the battery causing the internal temperature and pressure to rise. The result is the release of flammable electrolyte from the battery and, in the case of disposable lithium batteries, the release of molten burning lithium.

Once one battery cell goes into thermal runaway, it produces enough heat to cause adjacent battery cells to also go into thermal runaway. This produces a fire that repeatedly flares up as each battery cell in turn ruptures and releases its contents.

3.2.4 Fire prevention

Complying with the following subsections shall be considered as the most effective in preventing fire in the aircraft.

3.2.4.1 Resetting of tripped circuit breakers

Flight Crew Members may create a potentially hazardous situation if they reset a circuit breaker without knowing what caused it to trip. A tripped circuit breaker should not be reset in flight unless doing so is consistent with explicit procedures specified in the approved manuals and/or checklists used by the crew or unless, in the judgment of the Commander (PIC), resetting the circuit breaker is necessary for the safe completion of the flight.

A detailed entry in the airplane technical log (ATL) is a proven safety practice for tracking purposes and may provide maintenance personnel with key information to enable prompt trouble-shooting and effective corrective action on the ground.

Since circuit breakers are designed to open an electrical circuit automatically at a predetermined overload of current, they should not be used for operational functions (e.g. as an on / off switch) because they would not be performing their intended function, which is protection against overloads. Circuit breakers, even those suitable for frequent operation, should not be used as a switch to turn protected items on or off.

3.2.4.2 Handling of a crushed or damaged portable electronic device (PED)

CAT.GEN.MPA.140 AMC2, NCC.GEN.130 AMC2

There are a variety of ways that PED’s can be crushed or damaged in the aircraft including dropping, mishandling, electro-mechanical seats, etc. Just because a PED is damaged doesn't always mean it will go into thermal runaway, but it does become a hazardous material and should be treated as such.

The battery risk management system ‘FireSock’ can be used to place damaged PED’s into for the duration of the flight should they become damaged.

If the device is suspected of going into thermal runaway, the BATTERY / PED FIRE / SMOKE procedure shall be followed first before putting it into the FireSock.

3.2.5 Available cockpit / cabin firefighting equipment

► *Refer to the Operations Manual Part B Section **10 – Survival and emergency equipment including oxygen***

When fighting a fire, a Flight Crew Member has the tools as described below available. Refer to section 10 of this manual for its exact location (except for the water or non-flammable liquids).

3.2.5.1 Cargo fire protection

► *Refer to the Airplane Operations Manual Volume 3 Section 9-07 – Fire protection: Cargo / stowage compartment / lavatory fire protection*

3.2.5.2 Halotron BrX (non-halon) fire extinguisher

A Halotron BrX (non-halon) fire extinguisher may be used for fires of classes A, B and C. For the exact operation, please refer to section 10 of this manual.

3.2.5.3 Water fire extinguisher

Water fire extinguisher shall be used on fabric and paper fires only. It shall also be used for damping down the material that was on fire after using the fire extinguisher(s).

3.2.5.4 Water or non-flammable liquids

Water or non-flammable liquids shall be used on fabric and paper fires only. It shall also be used for damping down the material that was on fire after using the fire extinguisher(s).

3.2.5.5 Protective breathing equipment

If dense smoke is being generated, the protective breathing equipment (PBE) shall be fitted before entering the fire area. For the exact operation, please refer to **section 10 – Survival and emergency equipment including oxygen** of this manual.

3.2.5.6 Battery risk management system

The battery risk management system is for the transport of lithium battery-powered appliances (laptops, phones, personal electronic devices) in the aircraft after they have been crushed or damaged.

The fire-resistant burn bag is uniquely designed to contain fire in single cell or multiple cell lithium battery packs. Heat resistance gloves are included in the system and offer extra protection.

WARNING

Do not use fire resistant burn bags to isolate burning lithium-type batteries. Transferring a burning appliance into the burn bag may be extremely hazardous. Do not move the device until you are certain the fire is extinguished and the device is cooled.

3.2.5.7 Crash axe

A crash axe shall be used to gain access to closed areas or to get behind panelling.

3.2.6 Firefighting procedures

► *Refer to the Operations Manual Part A Section* ***9.5.5.2 – Emergency procedures during flight***

3.2.6.1 General

When fire is announced or detected, the crew shall immediately and aggressively pursue to fight that fire.

If smoke is detected in the cabin, the Second-in-Command (SIC) shall leave the cockpit to investigate the cause and eventually suppress the fire. He shall protect himself by donning the protective breathing equipment (PBE) and taking with him all available firefighting equipment available.

The Commander (PIC) shall in meantime protect himself and make it his priority to bring the aircraft in a position from where a landing can be made, should the firefighting not be successful.

When fighting a fire, communication between the 2 Flight Crew Members shall be maintained. Update the PF regularly on the location, source and severity of the fire.

When a cockpit / cabin fire is present, apply the following general procedures:

1. Close all fresh air vents in the area of the fire;
2. Remove portable oxygen bottles out of the area of the fire (if present);
3. Move passengers away from the fire if reseating is possible;
4. Check the operation of the hand fire extinguisher(s);
5. Put on the protective breathing equipment (PBE);
6. When moving through the aircraft, make yourself as little as possible to stay clear of smoke as long as possible.

The procedures below cover more specific actions to be taken depending on the location of the fire.

NOTE

Note that section 9 of the Operations Manual Part A contains several expended emergency procedure checklists covering specific procedures such as for dangerous goods incidents, battery fire / smoke, overheated battery without fire or smoke, crushed PED, etc.

3.2.6.2 Toilet fire

A toilet fire shall be suppressed by taking the following actions:

1. Locate the fire by using the back of your hand to check for heat and look for smoke around the toilet door panels;
2. Collect the available firefighting equipment including the crash axe.

If smoke or heat is not present:

1. With the fire extinguisher in hand, gently open the toilet door (crack door) and be prepared to discharge the extinguisher at the base of the fire;
2. Search for the cause of the smoke and take appropriate action (keep the burning material wet).

If smoke or heat is present:

1. With the fire extinguisher in hand, crack the door slowly using the door as shield. Discharge all extinguishant into the toilet area and close the door again;
2. Wait for a few minutes, obtain the other hand fire extinguisher if possible;
3. Check for smoke and if possible, enter the toilet to locate the base of the fire. If necessary, discharge the additional extinguisher.

3.2.6.3 Concealed fire

The majority of the aircraft systems are contained throughout concealed parts of the aircraft cabin and under floor areas. Fire may be identified by flames, smoke or fumes coming from behind panelling. In such case, take the following actions:

1. Locate the fire by using the back of your hand to check for heat;
2. Collect the available firefighting equipment including the crash axe;
3. Carefully remove panelling, taking care not to damage wiring or pipes. If panelling cannot be removed, make a small hole using the axe;
4. Discharge the hand fire extinguisher into the opening;
5. Replace the panelling for at least 30 seconds (if possible);
6. Confirm that the fire is extinguished; use the second extinguisher (if necessary) to repeat the above procedure.

3.2.6.4 Waste bin fire

A waste bin fire shall be suppressed by taking the following actions:

1. Collect the available firefighting equipment;
2. Open the container carefully;
3. Discharging the fire extinguisher(s);
4. Shut the container to allow the fire to go out;
5. When the flames are extinguished thoroughly soak the contents.

3.2.6.5 Baggage fire

A baggage fire shall be suppressed by taking the following actions:

1. Collect the available firefighting equipment;
2. Discharge the fire extinguisher into the bag and seal it up. Take care not to spread the fire with the force of the extinguisher;
3. Investigate the bag, use the second hand fire extinguisher if necessary;
4. When the fire is extinguished, thoroughly soak the content with water or non- flammable liquids.

3.2.6.6 Passenger seat fire

A passenger seat fire shall be suppressed by using the fire extinguisher. Once the fire has been extinguished, thoroughly soak the seat using water or non-flammable liquids.

3.2.6.7 Electrical fire

An electrical fire (coffee machine, cabin screens, etc) shall be suppressed by taking the following actions:

1. Switching off the electrics (if not possible due to the fire, use the appropriate circuit breaker);
2. Collect the available firefighting equipment;
3. Discharge the fire extinguisher(s).

3.2.6.8 Battery / PED fire / smoke (in the cabin)

CAT.GEN.MPA.140 AMC2, NCC.GEN.130 AMC2

Appliances such as laptops, cell phones, EFB's and other personal electronic devices (PED's) that are powered by lithium batteries pose a threat because these batteries have been known to unexpectedly enter a state of thermal runaway. Thermal runaway is caused by a defect in the one of the cells within the battery pack. This chemical reaction causes the cell to escalate in temperature often causing the adjacent cells to also enter this state. The result is extreme heat, a series of violent explosions causing out-gassing and flying debris, and smoke and fire of the surrounding packaging and nearby materials.

An electrical fire of a portable electronic device (PED) including personal transportation devices (hoverboards, self-balancing devices, gravity boards, etc) shall be suppressed by taking the following actions:

1. Identify the item;
2. Apply firefighting procedures;
3. Remove the external electrical power from the device (if applicable);
4. Cool the remaining cells with water or non-flammable liquids to prevent a (further) thermal runaway;
5. When the device has cooled (min 10 to 15 min), use protective equipment to put the device in a suitable empty container to completely submerge it in water or put the device in the fire-resistant burn bag.

CAUTION

It's important to understand that the fire-resistant burn bag does not stop thermal runaway nor does it 'smother' the fire. The bag is a containment device that contains heat, debris and reduces the likelihood of secondary fires caused by proximity.

Dousing with non-flammable liquids prevents adjacent cells from overheating. A battery pack involved in a fire can reignite multiple times as the heat is transferred to other cells in the pack. The device should be continually cooled with non-flammable liquids.

Use caution to ensure not to use liquids on, or in the immediate vicinity of any other piece of electrical equipment.

CAUTION

Do not to pick up and attempt to move a burning device or a device that is emitting smoke. Do not cover the device or use ice to cool the device. This would insulate the device increasing the overheating of device and resulting in a thermal runway.

3.2.6.9 Battery / PED fire / smoke in the cockpit

CAT.GEN.MPA.140 AMC2, NCC.GEN.130 AMC2

Because the electronic flight bag (EFB) is being used, the chances are high that crew will realise that the device is going into thermal runaway. Symptoms include:

1. Electrical smell,
2. Device feels hot to the touch,
3. Smoke emitting.

In these cases, the crew should act quickly to get the device into the fire-resistant burn bag (using protective equipment such as the heat resistant gloves) without sealing the bag. If possible, remove it from the flight crew compartment.

In the cabin, the crew then have can douse with water or other non-flammable liquids inside the bag.

In a situation where the device goes into full thermal runaway in the cockpit, best judgment has to be used on how best to deal with the event. It may be necessary to use the fire-resistant burn bag and heat resistant gloves to protect one's self in order remove the device from the area where the Flight Crew Member is seated and then follow the recommended procedures once it's transferred to the cabin. The biggest concern shall be crew injury or incapacitation when moving a device.

3.3 Unpressurised and partially pressurized flights

3.3.1 General

In case of a lack of oxygen on board or an unpressurised flight up to altitude of 14.000 ft MSL, the Commander (PIC) shall not accept a routing without marginal terrain clearance in IMC.

3.3.2 Decompression in flight

In case a decompression in flight is expected, all Flight Crew members shall act according to the applicable checklist. An emergency descent may have to be initiated.

Time permitting, the passenger may be briefed using the public address system. Clear and unambiguous instructions shall be given to the passengers to prepare them for the emergency possibly including an emergency descent. Note that, due to the decompression, a lot of noise created by the difference in pressure may limit the communication between the Flight Crew Members and the passengers. Also note that communication with passengers, while breathing pressured air, may be difficult for the Flight Crew Member. Instruct the passengers using "PUT ON MASK, SIT DOWN, FASTEN SEAT BELT" to avoid confusion.

3.4 Exceeding structural limits such as an overweight landing

► *Refer to the Standard Operating Procedures Manual Section 3-40 – Overweight landing*

An occurrence report (OR) shall be completed and an entry into the Aircraft Technical Log (ATL) shall be made.

3.5 Exceeding cosmic radiation limits

► *Refer to the Operations Manual Part A Section* ***8.3.18 – Cosmic or solar radiation detection***

The Company conducts quarterly radiation samplings using the Air Support PPS data. With the current type of operation the Company is conducting, no Flight Crew Member is likely to exceed the exposure of more than 1 mSv per year.

3.6 Lightning strikes

► *Refer to the Airplane Operations Manual Volume 3 Section 9-09 – Controls and indication: Lightning detection system*

► *Refer to the Operations Manual Part A Section **8.3.8 – Adverse and potentially hazardous atmospheric conditions***

► *Refer to the Operations Manual Part B Annex 1 - Supplementary Company checklist E545 / E550*

3.6.1 General

Even though the aircraft is adequately protected against lightning strikes effects, operating procedures shall be established in an attempt to avoid such phenomenon.

Avoid penetration of thunderstorms. In-flight lightning avoidance is closely associated with thunderstorm avoidance. Maintain visual contact with thunderstorms during the daytime and lightning at night.

Check the radar for precipitation, review all available types of weather information, examine other pilot reports and follow ATC instructions. Even with a good weather report received and understood, pay close attention to those storms that develop rapidly along the route in a given area and that cannot be predicted. While en-route, constantly update the previous weather briefing through radio contact and airborne equipment for actual storm avoidance.

Remember that radar detects only liquid droplets, not the cloud itself. Only rain suspended in the cloud will produce a radar echo, which may lead to occasional encounters with hail and lightning.

Circumnavigate the detected thundercloud or area, if possible, by more than 25 NM when traffic conditions permit. Flying over the top of the thunderclouds is preferable. Be aware that lightning may strike an aircraft miles away from the extreme side of a developed thunderstorm. Reports of aircraft receiving strikes in clear air at 25 or more miles from the nearest storm are common.

Direct effects, which result from lightning current attachment to and flow through the aircraft may be:

1. Pit marks are often seen along the fuselage or holes in the trailing edge of wing and tail tips;
2. Melting of rivets;
3. Puncturing of non-metallic structures;
4. Puncturing and de-lamination of composites;
5. Slight deformation of metal skins and structure;
6. Welding or roughening of moveable hinges and bearings;
7. Damage to other parts that may conduct lightning current other than the airframe, such as bonding or diverted straps and pitot tubes.

Effects caused by the flash-induced electromagnetic field and the increase of the voltage due to the current at the aircraft structure are defined as indirect effects and may be:

1. Interruption of instruments and navigation equipment;
2. Damage to electronic and electrical equipment;
3. Popping of circuit breakers;
4. Loss of electrical power;
5. Engine flame-out.

3.6.2 Lightning strike likely to occur

An imminent lightning strike event may be indicated to crews by the build-up of static discharge, which causes interference on ADF indicators or noise in communication receivers. Another indication is St. Elmo's fire, which is visible at night as small electrical discharges running across the windshields and sparking on the wings. Consider wearing sunglasses to protect your eyes from the flash or have one pilot keep his eyes downward. Approaching an aircraft during a thunderstorm is not recommended. The human body may provide the grounding that is otherwise lacking. If you are in the cockpit, do not attempt to communicate with ground personnel through a wire handset and stay inside the aircraft until the storm has passed.

No fueling shall take place as long as thunderstorms or lightning are occurring at or near the aerodrome.

3.6.3 Aircraft hit by lightning

Since no procedure is available from the Manufacturer, it is recommended to follow the following procedure once the situation in the aircraft is under control:

1. Circuit breakers.....Check all in
2. Compass and heading system.....Check for normal indication
3. Engine indications.....Check for normal indication
4. Pressurisation.....Check for normal indication
5. Flight controls.....Check free movement
6. Fuel system.....Check for normal operation and no fuel leaks
7. EFB system.....Check for normal operation
8. All other systems.....Check for normal operation and indication

3.6.4 After landing procedures

After landing an aircraft, which was hit by lightning, the Commander (PIC) shall:

1. Check for holes, punctures, discoloration and de-lamination throughout the whole airframe;
2. Verify for loose, melted or missing rivets;
3. Check that all static dischargers are in place;
4. Verify the integrity of the lights installed on tail, wing, fuselage and landing gear;
5. Verify all antennas, pitot tubes, angle-of attack vanes, TAT probes and static ports for condition.

An occurrence report (OR) shall be completed and an entry into the Aircraft Technical Log (ATL) shall be made.

3.7 Distress communications

► *Refer to the Operations Manual Part A Section **12.3.2 – Distress and urgency communication procedures***

Distress communications and communications failure procedures are published in the emergency section of the Jeppesen Airway Manual for the area of operation.

3.7.1 Frequencies and codes

Any distress call shall be done on the frequency in use for the normal communications. The following frequencies shall be used worldwide in order to maintain a uniform monitoring of emergency frequencies:

1. VHF – 121,5 MHz,
2. UHF – 243,0 MHz,
3. HF – 500 KHz, 2.182 KHz or 8.364 KHz.

NOTE
This type of aircraft is equipped with HF and VHF communication equipment.

To indicate that an aircraft is in a state of emergency, the following transponder codes shall be used:

1. Mode A Code 7700 in case of an emergency;
2. Mode A Code 7600 in case of radio failure when continuing your IFR flight plan;
3. Mode A Code 7601 in case of radio failure when you are in VMC and you decide to land at the nearest suitable aerodrome instead of continuing the flight;
4. Mode A Code 7500 in the case of an unlawful interference.

The distress message made via radiotelephony shall be made on the air-ground frequency in use at the time and should include as much of the following elements as possible:

1. Name of the station addressed;
2. The identification of the aircraft;
3. The nature of the distress condition;
4. Intention of the person in command;
5. Present position, level (i.e. flight level, altitude…) and heading.

3.7.2 Distress signals

Using the following signals, either together or separately, means that the aircraft is threatened by imminent danger and that it needs immediate assistance:

1. A signal made by radiotelegraphy or by any other communication method consisting of the letters SOS (. . . - - - . . . in Morse Code);
2. A radiotelephony message containing the spoken word MAYDAY (3 times);
3. Rockets or shells throwing red lights, fired one at a time at short intervals;
4. A flare showing a red light.

3.7.3 Urgency signals

Using the following signals, either together or separately, means that the aircraft is experiencing difficulties, which compel it to land, but does not need immediate assistance:

1. The repeated switching on and off of the landing lights;
2. The repeated switching on and off of the navigation lights in such a manner as to be different from the normal flashing of the navigation lights.

Using the following signals, either together or separately, means that the aircraft has an urgent message to transmit, concerning the safety of a ship, aircraft or other vehicle, or of some person onboard or within sight:

1. A signal made by radiotelegraphy or by any other communication method consisting of the letters XXX;
2. A radiotelephony message containing the spoken word PANPAN (3 times).

3.7.4 Communication failure

An aircraft operated as a controlled flight shall at all times maintain continuous listening watch on the frequency currently in use or 121,5 MHz and establish two-way communications with the appropriate ATC unit.

If a communication failure makes it impossible to establish contact with ATC, the transponder shall be switched to 7600 or 7601 depending on the flight conditions and the decision to continue with the flight or divert to the nearest suitable aerodrome.

When the decision is made to divert to the nearest suitable aerodrome while in VMC conditions, the transponder code 7601 shall be selected and:

1. Continue to fly in VMC;
2. Land at the nearest suitable aerodrome;
3. Report its arrival by the most expeditious means to the appropriate air traffic control unit.

When the decision is made to continue with the IFR flight plan (even in VMC), the transponder code 7600 shall be selected and:

1. Unless otherwise prescribed on the basis of regional air navigation agreements, maintain last assigned speed and level, or minimum flight altitude if higher, for a period of 7 minutes following the aircraft's failure to report its position over a compulsory reporting point and thereafter adjust level and speed in accordance with the filed flight plan;
2. Proceed according to the current flight plan to the appropriate designated navigation aid serving the destination aerodrome and, when required to ensure compliance with point below, hold over this aid until commencement of descent;
3. Commence descent from the navigation aid specified in the point above at, or as close as possible to, the estimated time of arrival resulting from the current flight plan;
4. Complete a normal instrument approach procedure as specified for the designated navigation aid;
5. Land, if possible, within thirty minutes after the estimated time of arrival specified above or the last acknowledged expected approach time, whichever is later.

3.8 Engine failure

► *Refer to the Standard Operating Procedures Manual Section 3-15 – Rejected take-off (RTO), engine failure, engine failure at or above V1 and single engine flight technique*

► *Refer to the Standard Operating Procedures Manual Section 3-20 – One engine inoperative climb*

► *Refer to the Standard Operating Procedures Manual Section 3-25 – Driftdown*

► *Refer to the Standard Operating Procedures Manual Section 3-35 – One engine inoperative precision approach, one engine inoperative non-precision approach, one engine inoperative circling approach, one engine inoperative visual approach and one engine inoperative go-around*

3.8.1 V_1 concept

V_1 is the maximum speed at which, if an engine fails, a rejected take-off may be decided. A rejected take-off after V_1 will result in an overrun if the field does not have a balanced length.

3.8.2 Engine failure below V_1

When the runway length is limited, with a rejected take-off at V_1, the aircraft performance is calculated so that the aircraft is able to stop on the available accelerate stop distance with maximum braking effort. The number of accidents involving aircraft making an overrun after a rejected take-off indicates that the safety margin is extremely small.

Statistics show that, in a recent period, more take-off's were rejected due to landing gear problems than due to engine failures. Calculated take-off performance does not cover tire, brake or landing gear malfunctions during take-off roll.

Either Flight Crew Member has the authority to call for rejection of take-off. The Flight Crew Member deciding to reject the take-off shall call "STOP" in a loud and clear voice. Once the decision has been made to reject the take-off, it is mandatory that the reject procedure is strictly adhered to without delay.

CAUTION

Whereas the Standard Operating Procedures Manual uses "REJECT" as standard callout to initiate a rejected take-off, the standard Company callout "STOP" shall be used instead.

3.8.3 Engine failure at or above V_1

The Flight Crew Member recognising such an event shall call out "ENGINE FAILURE" as appropriate. Confirmation of loss of thrust or mechanical failure shall be sought from 2 or more instruments in order to distinguish between a single instrument failure and an engine failure.

3.9 System failures

► *Refer to the Aircraft Flight Manual Section 4 – Abnormal and emergency procedures*

Some systems and/or equipment may require some more detailed explanation (e.g. specific and/or additional abnormal and/or emergency procedures for a certain system and/or equipment); hence they shall be detailed below if so required.

NOTE

Currently no such systems and/or equipment require such more detailed additional abnormal and/or emergency procedures.

3.10 Guidance for diversion in case of serious technical failure

► *Refer to the Aircraft Flight Manual Section 4 – Abnormal and emergency procedures*

► *Refer to the Operations Manual Part A Section 2.3.6.4 – Diversion of flight en-route*

► *Refer to the Operations Manual Part B Section **11.2.2 – Unplanned or planned emergency landing or ditching***

3.10.1 General

The Commander (PIC) may decide to land as soon as practicable or as soon as possible in case of serious technical troubles to safeguard the integrity of the aircraft and the safety of his passengers. Any aerodrome that fits, according to the judgement of the Commander (PIC), shall be agreed with.

3.10.2 Secondary considerations

In spite of the Commander's (PIC's) final authority concerning the possible diversion of any flight, many parameters may influence his decision:

1. Aircraft system status: The crew should ascertain the status of not only the failed system but also any other aircraft system(s) that have may have been affected by the failure;
2. Approach speeds and landing distance: In many cases, a failure shall have impact on approach and landing speeds, crosswind limitations and landing distance required;
3. Weather requirements: Some failures may result in a loss or reduction of the aircraft's weather capabilities;
4. Range and endurance considerations: Certain failures may result in a higher than normal rate of fuel consumption. It may also be necessary to operate at a lower than normal altitude.

3.10.3 Post landing procedures

Once the aircraft is safely parked, the Commander (PIC) shall in the first place ensure coordination so that the passengers are being taken care of, hence arrange technical actions for the aircraft.

3.11 Ground proximity warning

CAT.OP.MPA.290

► *Refer to the Airplane Flight Manual Section 3-35 – Terrain Awareness and Warning System (TAWS)*

► *Refer to the Airplane Operations Manual Volume 3 Section 9-15 – Warning: Terrain awareness and warning system (TAWS)*

► *Refer to the Operations Manual Part A Section **8.3.5 – Ground proximity warning system procedures***

The Terrain Awareness and Warning System (TAWS) is designed to alert Flight Crew Members that the aircraft position in relation to the terrain is abnormal and, if not corrected, could result in a controlled flight into terrain (CFIT). It is the responsibility of the Commander (PIC) to develop and implement a plan which employs all available sources to ensure adequate terrain clearance. The TAWS system shall be on for take-off until landing provided the system does not require any other procedure.

When a warning occurs during daylight VMC conditions, if positive visual verification is made that no hazard exists or if it is the result of an intentionally chosen configuration or position as part of a standard procedure, the warning may be considered cautionary.

A go-around shall be initiated, whenever a TAWS warning is observed and if the cause of warning cannot be identified immediately. If a TAWS warning occurs (unless operating in VMC and/or the pilot determines, based on all available information, that a turn in addition to the procedures established below is the safest course of action), proceed as follows:

1. Disconnect the autopilot;
2. Apply maximum thrust;
3. Roll wings level and rotate to increase pitch attitude to the highest possible value;
4. Retract the speedbrakes if extended;
5. When stick shaker is encountered, reduce pitch attitude to keep the shaker speed as minimum;
6. Do not change gear or flaps configuration until terrain separation is assured;
7. Monitor radio altitude for sustained or increasing terrain separation;
8. When clear of terrain, slowly decrease the pitch attitude and accelerate;
9. Do not attempt to engage the autopilot during recovery.

Any TAWS activation shall be reported in writing using an occurrence report (OR) whether genuine or spurious. When such activation indicates a technical malfunction of the system an appropriate entry shall also be made in the technical log.

The GPWS may not be deactivated except when specified by an approved procedure. As a general policy no GPWS warning signals / announcements shall be ignored and proper action shall be taken immediately. However, there may be aerodromes located in difficult terrain where one or more warning envelopes may be exceeded, resulting in constant warnings at a given approach position or at take-off. For these aerodromes it is an absolute must to include the discussion of the GPWS-warnings into the approach and departure procedure briefing. With the consent of the Flight Operations Manager (as published in the aerodrome qualification briefing), the GPWS system may temporarily be muted.

3.12 TCAS warning

CAT.OP.MPA.295

► *Refer to the Airplane Flight Manual Section 3-35 – Traffic alert and collision avoidance system*

► *Refer to the Operations Manual Part A Section **8.3.6 – TCAS / ACAS policy and procedures***

This section contains the aircraft specific TCAS / ACAS operational procedures. The general procedures shall be depicted in the relevant sections of the OM Part A as detailed in the references above.

NOTE

No aircraft specific operational procedures required for this type of aircraft besides the procedures already depicted in the OM Part A as mentioned in the reference above.

3.13 Windshear

► *Refer to the Airplane Operations Manual Volume 1 Section 3-45 – Windshear*

► *Refer to the Standard Operating Procedures Manual Section 2-83 – Detailed normal procedures: Windshear*

► *Refer to the Standard Operating Procedures Manual Section 3-15 – Windshear*

► *Refer to the Standard Operating Procedures Manual Section 3-40 – Windshear*

► *Refer to the Operations Manual Part A Section **8.3.8.5 – Windshear***

3.14 Severe turbulence and/or gust encounter

► *Refer to the Standard Operating Procedures Manual Section 2-80 – Detailed normal procedures: Turbulent air penetration*

► *Refer to the Standard Operating Procedures Manual Section 3-25 – Turbulent air penetration*

► *Refer to the Operations Manual Part A Section **8.3.8.4 – Turbulence***

3.15 Emergency landing & ditching

► *Refer to the Standard Operating Procedures Manual Section 3-40 – Ditching and forced landing*

► *Refer to the Operations Manual Part A Section **8.3.16 – Cabin safety requirements***

► *Refer to the Operations Manual Part A Section **8.3.17 – Passenger briefing procedures and relations with the Passengers***

► *Refer to the Operations Manual Part B Section **11 – Emergency evacuation procedures***

Section 11 of this manual describes the Company evacuation procedures to be known by every Flight Crew Member.

3.16 Departure contingency procedures

► *Refer to the Airplane Flight Manual Section 4 – Emergency and abnormal procedures*

► *Refer to the Operations Manual Part B Section **3.8 – Engine failure***

► *Refer to the Operations Manual Part C Section 4.2.3.2 – Special departure procedure charts*

In case of any occurrence, the Commander (PIC) shall make all decisions necessary to proceed according to the specific procedures as set out in the AFM.

NOTE

Flight Crew Members shall be reminded of the importance of reviewing the one engine inoperative (OEI) net climb gradient for the aircraft before take-off is commenced.

SECTION 4 - PERFORMANCE

► *Refer to the Airplane Flight Manual Section 5 – Performance*

► *Refer to the Airplane Operations Manual Section 5 – Performance*

► *Refer to the Airplane Operations Manual Section 6 – Flight planning*

► *Refer to Operations Manual Part A Section **8.1.2.4 – Performance considerations***

► *Refer to Operations Manual Part C Section 4 – Runway data and aerodrome facilities*

4.1 General

CAT.POL.A.100 (a), CAT.POL.A.200

The aircraft shall be considered as a performance class A aircraft.

Every Flight Crew Member shall ensure that the mass of the aircraft at the start of the take-off or in the event of in-flight re-planning, at the point from which the revised operational flight plan applies, is not greater than the mass at which the requirements as detailed in the OM Part A can be complied with for the flight to be undertaken, allowing for the expected reductions in mass as the flight proceeds. Performance data as described in the Aircraft Flight Manual shall be used to calculate any desired performance.

4.2 Use of APG runway analysis

► *Refer to Operations Manual Part A Section **8.1.2.5 – Landing distance assessment procedures***

► *Refer to Operations Manual Part C Section **4.2 – APG runway analysis***

A runway analysis shall be prepared for each flight and this via the link generated in the applicable flight information page of the Crewbriefing website.

Crew shall use the RCR provided to determine the expected performance of their aircraft by correlating the RWYCC or the reported runway condition description with performance data provided via APG. This helps the crew to correctly carry out their landing and take-off performance calculations for wet or contaminated runways. APG provides data for the following runway conditions which correlates with the following RWYCC’s for this type of aircraft:

Table: APG provided runway condition performance data

APG provided runway condition performance data		
Runway condition(1)	**RWYCC**	**Notes**
Autothrottle	N/A	Landing data only
Compact snow	3 or 4	RWYCC 3 when above OAT -15°C and RWYCC 4 at or below OAT -15°C
Crosswind above 25 kts	N/A	Take-off data only
Dry snow 3,2 mm	3	3,2 mm = 1/8 inch
Dry snow 6,4 mm	3	6,4 mm = 1/4 inch
Engine anti-ice on	N/A	
Engine + wing anti-ice on	N/A	
Slush 3,2 mm	2	3,2 mm = 1/8 inch
Slush 6,4 mm	2	6,4 mm = 1/4 inch
Steep approach	N/A	
Water 3,2 mm	2	3,2 mm = 1/8 inch
Water 6,4 mm	2	6,4 mm = 1/4 inch
Wet	5	
Wet snow 3,2 mm	2	3,2 mm = 1/8 inch
Wet snow 6,4 mm	2	6,4 mm = 1/4 inch
Autobrake	N/A	
Note 1: Dry runway performance data is as default always provided (RWYCC 6) even when not selecting any available runway condition.		

4.3 Additional performance data

Whereas the APG runway analysis provides the necessary performance data for compliance with the performance requirements as depicted in the various sections of the OM Part A, additional performance data is available.

The table below gives an overview on where to find what performance data in the aircraft flight manual (AFM) or aircraft operations manual (AOM).

Table: Additional performance data cross-reference list

Additional performance data cross-reference list		
AIR-OPS reference	Manufacturer's Aircraft Flight Manual (AFM) or Aircraft Operations Manual (AOM)	
All engine climb gradient	Climb	AOM 6-10
Drift-down data	Driftdown	AOM 5-25
Effect of de-icing / anti-icing fluids	No data published	
Flight with landing gear down	No data published	
Flights conducted using the CDL	Configuration deviation list	AFM appendix 1

SECTION 5 – FLIGHT PLANNING

5.1 Flight planning

► *Refer to the Airplane Flight Manual Section 5 – Performance*

► *Refer to the Airplane Operations Manual Section 5 – Performance*

► *Refer to the Airplane Operations Manual Section 6 – Flight planning*

► *Refer to the Operations Manual Part A Section **8.1 – Flight preparation instructions***

► *Refer to the Operations Manual Part A Section **8.3 – Flight procedures***

► *Refer to Operations Manual Part A Annex 22 – Risk assessment form life raft SPO/NCC*

► *Refer to **10.1.12 - Life raft***

Data and instructions necessary for pre-flight and in-flight planning including factors such as speed schedules and thrust settings are to be found in the Aircraft Flight Manual or Aircraft Operating Manual. PPS flight planning software shall be used to complete pre-flight planning. It includes aircraft performance data from the Aircraft Flight Manual (AFM).

In case of engine-out operations the crew shall refer to the applicable performance data in the Aircraft Flight Manual (AFM) or Aircraft Operating Manual (AOM).

5.2 Fuel policy

► *Refer to the Operations Manual Part A Section* ***8.1.7 – Quantities of fuel / energy carried***

► *Refer to the Operations Manual Part A Section* ***8.3 – Flight procedures***

► *Refer to the Operations Manual Part B Section* ***2.7.2 - In-flight fuel management policy and procedures***

PPS flight planning software shall be used to complete pre-flight fuel planning. It includes aircraft fuel consumption data from the Aircraft Flight Manual. Legal reserve, contingency and taxi fuel are included in the overall PPS calculation for the required fuel.

The standard value for taxi fuel is as follows (to be adjusted if required):

- For the E545: 60 kg
- For the E550: 80 kg

SECTION 6 - MASS AND BALANCE

6.1 General

CAT.POL.MAB.100 (a), CAT.POL.MAB.100 (a) AMC1

► *Refer to the Airplane Operations Manual Volume 2 Section 7 – Weight and balance*

► *Refer to the Operations Manual Part A Section **8.1.8 – Mass and center of gravity***

► *Refer to the Operations Manual Part B Section **1.6 – Mass and balance limitation***

This section complements the general rules established in the Operations Manual Part A Section 8 and the mass and balance information contained in the Aircraft Flight Manual.

6.2 Aircraft specific mass and balance values

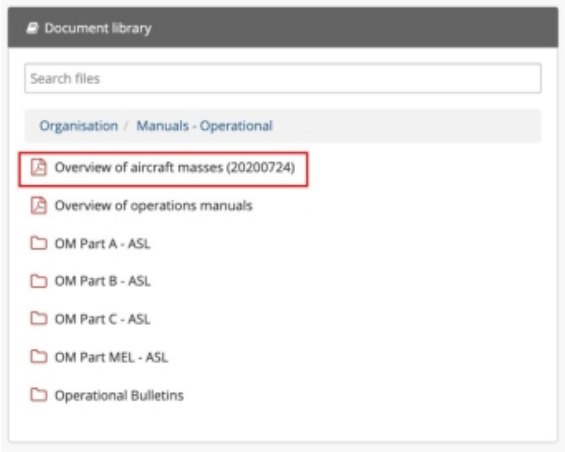
► *Refer to the Overview of Aircraft Masses*

6.2.1 General

The Company uses a separate overview referred to as 'Overview of Aircraft Masses' to keep track of the aircraft specific mass and balance values such as basic empty mass (BEM), dry operating mass(es) (DOM), indexes, etc and this of the different Company aircraft.

The overview is kept up to date under the responsibility of the Flight Operations Manager (FOM) and is distributed making it available in the digital Company library accessible to all Personnel via the Company secured website or via the Company electronic flight bag (EFB) system. The overview is stored in the 'Manuals – Operational' folder together with all parts of the Operations Manual (OM) and Operational Bulletins (OB's).

Figure: Location of the Overview of Aircraft Masses



The Competent Authority shall be provided with an electronic copy every time the overview has been updated. It shall be presented to the Competent or any Inspecting Authority when so requested.

NOTE

Other mass and balance related values specific to this type of aircraft or the type of operation such as for example required to determine the dry operating mass (DOM) shall remain part of this manual and are not included in the overview. It may be hence required to present both the overview and this section of the manual to the Competent or Inspecting Authority when so requested.

NOTE

Basic empty mass (BEM) depicted in the overview may differ slightly from the published values as depicted on the aircraft weighing form (part of the AFM) as masses may be rounded up to the nearest unit and this for easier calculation purposes (e.g. 20,6 kg becomes 21 kg) and/or Company planning software limitations. All other values (i.e. DOM, indexes, etc) are calculated as such to meet the round-up of the aircraft basic empty mass.

6.2.2 Determination of dry operating mass

► *Refer to the Operations Manual Part A Section* ***8.1.8.6 – Mass values for Passengers, Task Specialists and Crew***

► *Refer to the Operations Manual Part A Section* ***8.1.8.7 – Mass values for operational equipment***

The dry operating mass (DOM) for this type of aircraft is based on the basic empty mass including 2 pilots of each 85 kg.

The operational equipment, as described in the Operations Manual Part A, part of the aircraft is determined as being 55kg (E545) / 75 kg (E550) with an average flight station (arm) of 6,52 m (E545) / 4,36 m (E550).

6.3 FMS weight and balance

► *Refer to the Airplane Operations Manual Volume 2 Section 7-20 – FMS weight and balance pages*

The FMS weight and balance (WT & BAL) pages provide means to load and dispatch the airplane within CG limits. It has to be computed in order to get the TRIM index. It uses the weight and balance database with airplane passenger arrangement, fuel data, passenger and baggage compartment loading to calculate the airplane gross weight (GW) and CG for all flight phases.

SECTION 7 - LOADING

► *Refer to the Airplane Flight Manual Section 2 – Limitations*

► *Refer to the Airplane Operations Manual Volume 2 Section 7 – Weight and balance data*

► *Refer to the Operations Manual Part A Section* ***8.2.2 – Aircraft, Passengers, Task Specialist and cargo handling procedures related to safety***

► *Refer to the Operations Manual Part B Section* ***6 – Mass and balance***

7.1 General

The aircraft shall be loaded in compliance with the centre of gravity location limits. Luggage in the cargo compartment shall be properly loaded and secured to prevent any shift of position that could result in a CG change.

7.2 Procedures for loading specific aircraft configurations

There are no specific configurations (e.g. cargo configuration) that shall need special attention and/or procedures when loading the aircraft.

SECTION 8 - CONFIGURATION DEVIATION LIST

► *Refer to Airplane Flight Manual Appendix 1 – Configuration Deviation list*

► *Refer to the Operations Manual Part A Section* ***8.6 – Use of the minimum equipment list and configuration deviation list***

The Configuration Deviation List (CDL), as provided by the Manufacturer, is part of the aircraft Airplane Flight Manual (AFM).

SECTION 9 - MINIMUM EQUIPMENT LIST

► *Refer to the Operations Manual Part A Section* ***8.6 – Use of the minimum equipment list and configuration deviation list***

► *Refer to the Minimum Equipment List (MEL)*

For practical reasons, the Minimum Equipment List (MEL) is published as a separate manual.

SECTION 10 - SURVIVAL AND EMERGENCY EQUIPMENT INCLUDING OXYGEN

10.1 Emergency and safety equipment

CAT.GEN.MPA.145, CAT.GEN.MPA.145 AMC1

► *Refer to the Airplane Operations Manual Volume 3 Section 9-01-70 – Emergency equipment*

10.1.1 General

It is the responsibility of the Commander (PIC) to ensure that all required emergency and safety equipment (E&SE) is carried, located and inspected as indicated below. The equipment as listed below shall be carried unless exceptions are covered by the MEL.

The table below shall detail all the emergency and safety equipment that is required to be on board the aircraft. The exact location of all the applicable equipment is depicted in the figure further down below.

In case of a conflict in contents (i.e. amount of specific equipment installed) between this section and the Minimum Equipment List (MEL), the MEL shall prevail.

NOTE

For several emergency and safety equipment items, Flight Crew Members shall check the expiration date to be within limits as part of their pre-flight inspection as depicted in several subsections below. If such an item is however labelled 'DO NOT LABEL – COMPONENT TRACKED BY CAMO', the Flight Crew Member is waived from his responsibility to check for any expiration date as one is not present and the item is monitored by Company CAMO Personnel. If any date is still present on the item with the Company label placarded, this date shall be ignored as it may be another type of date (e.g. issue date) or date not relevant to the Company type of operations.

Table: Emergency and safety equipment list

Emergency and safety equipment list		
Equipment		Quantity
Emergency locater transmitter (ELT)[4]		1
Halotron BrX hand fire extinguisher		2
Water hand fire extinguisher		1
Crash axe		1
First aid kit		1
Universal precaution kit (UPK)		1
Supplemental personal protective equipment (PPE)[4]		As required[1]
Flashlight		2
Life jacket cabin (adult / child)	OO-NEY	9
	PH-LGD	10
Life jacket cabin (infant)[4]		As required[1]
Life jacket cockpit		2
Life rafts		As required[1]
Protective breathing equipment (PBE)		3
Battery risk management system		1
Smoke goggle		2
Survival equipment[4]		As required[1]
Cabin seat belt (adult / child)[4]	OO-NEY	8[2]+1[3]
	PH-LGD	9[2]+1[3]
Cabin seat belt (infant)[4]		As required[1]
Cabin oxygen mask[4]	OO-NEY	13
	PH-LGD	14
Cockpit oxygen mask[4]		2
Passenger safety briefing card[4]	OO-NEY	9
	PH-LGD	10

Note 1: Only when required, not part of the standard equipment.
Note 2: Cabin seats equipped with a 3-point upper torso restraint system type seat belt.
Note 3: Toilet seat equipped with a 2-point type of seat belt.
Note 4: Not depicted on the layout figure as detailed below.

Figure: Emergency and safety equipment layout – Aircraft with registration OO-NEY

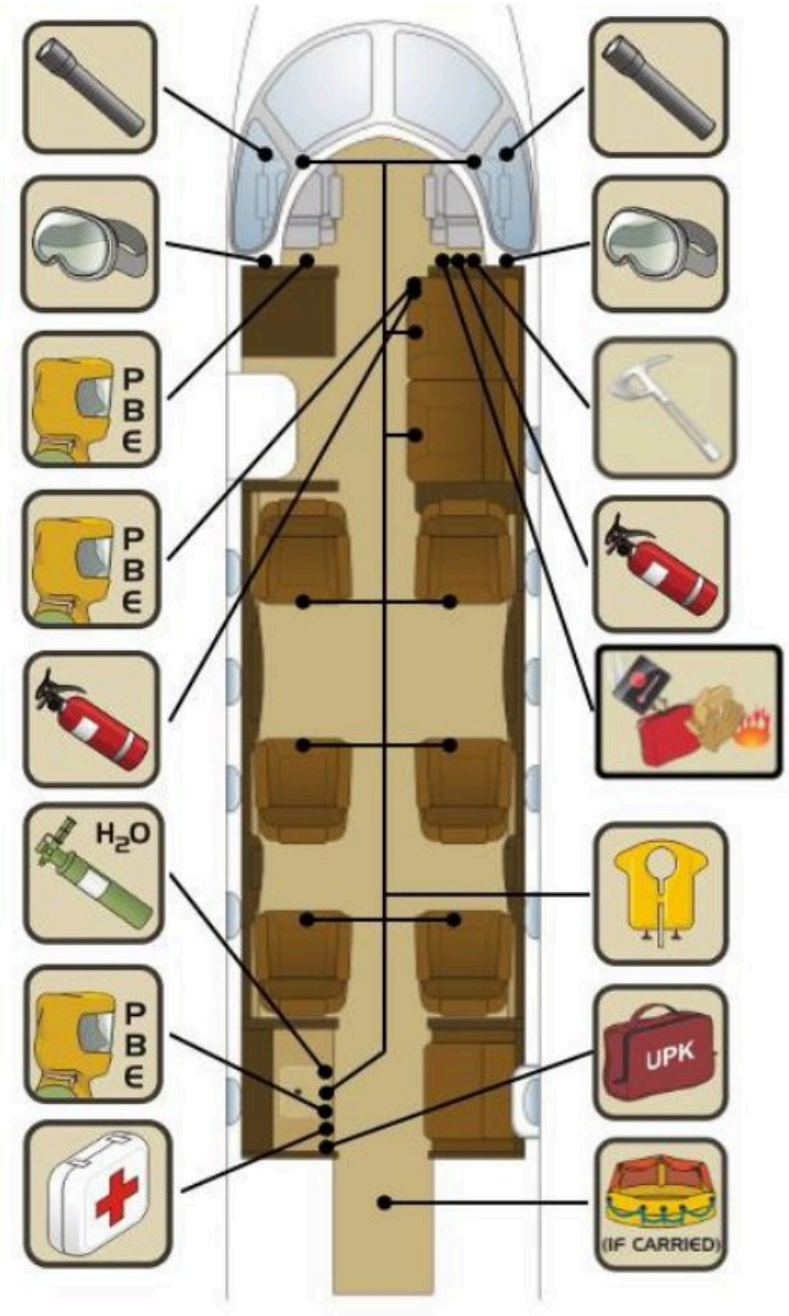
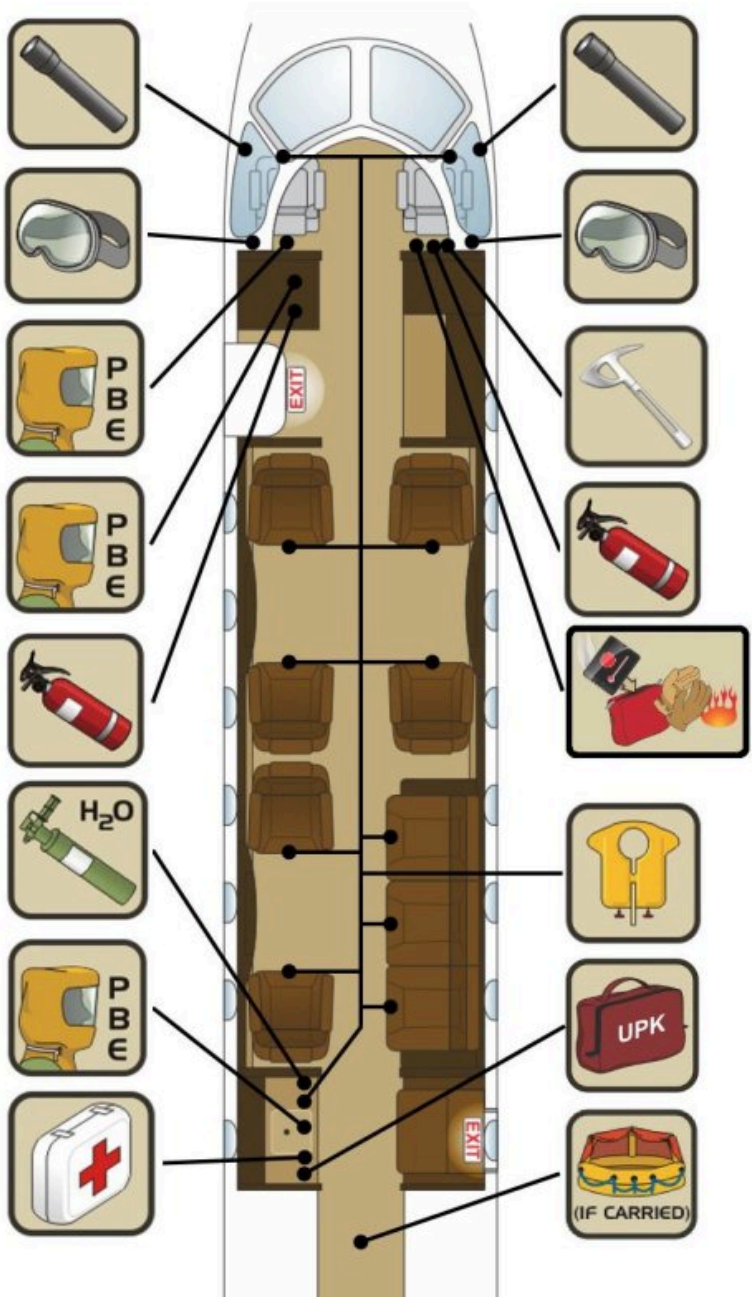


Figure 17: Emergency and safety equipment layout – Aircraft with registration PH-LGD



10.1.2 Emergency locater transmitter

CAT.IDE.A.280, NCC.IDE.A.215

► *Refer to the Airplane Operations Manual Volume 3 Section 9-01-70 – Emergency equipment: Emergency locator transmitter (ELT)*

The aircraft is equipped with an automatic fixed emergency locator transmitter (ELT(AF)).

10.1.3 Hand fire extinguisher

CAT.IDE.A.250, NCC.IDE.A.205

► *Refer to the Operations Manuals Part B Section **3.2 – Fire and smoke drills***

10.1.3.1 General

The aircraft is equipped with 3 hand fire extinguishers:

1. Two fire extinguishers are portable and pressurized containing a Halotron BrX (non-halon) extinguishing agent. Each bottle has an actuating valve operated by hand and the extinguisher is rated for class A, B and C fires. The extinguishing agent is not suitable for use against class K (burning fat, oil) fires.
2. A third fire extinguisher situated in the lavatory cabinet and contains pressurized water.

10.1.3.2 Location

One fire extinguisher is located in the cockpit behind the right-hand cockpit seat (within reach of at least one Flight Crew Member). In the aircraft with registration OO-NEY, a second fire extinguisher is located at the bottom of the divan right armrest. In the aircraft with registration PH-LGD, a second fire extinguisher is located in the left galley cabinet. A third fire extinguisher is located in the lavatory cabinet below the sink.

10.1.3.3 Operation

10.1.3.3.1 Halotron BrX Fire Extinguisher

To operate a fire extinguisher:

1. Open both latch hooks and remove the fire extinguisher.
2. Hold the fire extinguisher upright with one hand and remove the safety pin with the other hand.
3. Aim the nozzle of the fire extinguisher at the base of the fire. The optimal distance to the fire-base is between 1.5 – 2 meters.
4. Push the lever of the fire extinguisher. This will immediately start the flow of agent. Releasing the lever will interrupt the flow.
5. Sweep the agent stream from side to side, until the fire is extinguished. Once the fire goes out, keep an eye on the area, and be prepared to repeat the process if the fire re-ignites.
6. Operating time: approx. 9 -10 seconds.

Refer to the figure below for a graphical presentation on the components of the fire extinguisher.

Figure: Components of the Halotron fire extinguisher



10.1.3.3.2 Pressurised water fire extinguisher

1. Open the latch hook and remove the fire extinguisher.
2. Turn the handle to the right as far as possible to activate the extinguisher.
3. Hold the extinguisher erect to ensure proper discharge.
4. Press the lever to discharge the extinguishing agent.
5. Direct the stream at the base of the flame for maximum effectiveness.

Figure: Components of the pressurized water fire extinguisher



10.1.3.4 Pre-flight inspection

Check the correct amount on board, the location according to this section and if all are secured accordingly. For Halotron fire extinguishers, check that the pressure gauge is in the green band and the locking pin is in place. Check the expiration date to be within limits.

10.1.4 Crash axe

CAT.IDE.A.255, NCC.IDE.A.206

10.1.4.1 General

The aircraft is equipped with one crash axe. It shall be used to break in or out during an emergency. It may also be used to open doors (e.g. toilet door) or cut holes into aircraft panelling in case of fire.

The handle of the crash axe is insulated against electrical shocks.

10.1.4.2 Location

The crash axe is secured to the partition in the cockpit behind the right-hand cockpit seat (within reach of at least one Flight Crew Member).

10.1.4.3 Operation

When using the crash axe as a means of getting out of the aircraft, use the blade of the axe first to make a horizontal cut in the insulation along the top boundary of the evacuation area. After tearing away the insulation, the pick of the axe should be used to make the initial puncture through the fuselage, starting in the upper left-hand corner. The blade of the axe should then be used to chop through the top and two sides, forming an ‘n’. The skin of the aircraft should then be kicked outward, resulting in an emergency exit free of a jagged edge along the bottom boundary.

10.1.4.4 Pre-flight inspection

Check the correct amount on board, the location according to this section and if secured accordingly.

10.1.5 First aid kit

CAT.IDE.A.220, NCC.IDE.A.190

General

The aircraft is equipped with a first aid kit (FAK) easily accessible in the cabin area and inspected on regular basis. All 3 parts of the first aid kit shall be sealed so it is easily detectable that something from the kit was used and thus needs to be replaced.

10.1.5.1 Location

The first aid kit shall be located in the lavatory cabinet below the sink.

10.1.5.2 Operation

The first aid kit (FAK) is tailored to the operational requirements applicable to the Company.

Figure: Company first aid kit (FAK)



The items in the kit are stored in 3 different parts of the red softbag depending on its use which are classified as follows:

1. Left pouch being the ‘bandages section’;
2. Central pouch being the ‘general section’; and
3. Right pouch being the ‘medication section’.

A complete list of items may be found in the table below depicting the type of item, its location and any additional remarks if required.

Table: First aid kit (FAK) content and description

First aid kit (FAK) content and description			
Item	Pouch	Amount	Remarks
Equipment			
Bandages	Left	3	Assorted sizes including triangular bandages
Burns dressings	Center	2	
Wound dressings	Left	2	Large and small
Adhesive dressings	Center	30	Assorted sizes
Adhesive tape	Center	1	
Adhesive wound closures	Left	5	
Safety pins	Center	12	
Safety scissors	Center	1	
Antiseptic wound cleaner	Center	1	
Disposable resuscitation aid	Center	1	
Disposable gloves	Center	2 x 2	Additional equipment in UPK
Splinter tweezers	Center	1	
Non-mercury thermometer	Center	1	
Surgical masks	Center	2	Additional equipment in UPK
Medication			
Simple analgesic (including pediatric form)	Right	1 x 20	Paracetamol 500 mg
		1 x 10	Paracetamol 120 mg
Antiemetic (non-injectable and including pediatric form)	Right	1 x 25	Cinnarizine 25 mg
Nasal decongestant	Right	1 x 10 ml	Xylometazoline nose drops 0,1 %
Gastrointestinal antacid	Right	1 x 24	Rennie
Anti-diarrhoeal medication	Right	1 x 10	Loperamide 2 mg
Antihistamine (including pediatric form)	Right	1 x 10	Cetirizine 10 mg
Other content			
Content list + due dates	Center	1	Drafted in English and Dutch and includes the amount carried and its due date (if any)
List of effects	Center	1	Drafted in English and Dutch and includes information on the effects and side effects of medications carried
Search and rescue signals	Center	1	For use by survivors in ground / air communication
First aid handbook	Center	1	Current edition
Basic life support instruction cards	Center	2	Summarising and depicting the current algorithm for basic life support
Medical incident report form	Center	2	To be completed whenever a medical incident occurs onboard and to be handed over to the ground medical services.

First aid kit (FAK) content and description			
Item	Pouch	Amount	Remarks
Additional equipment			
Bag-valve masks	Center	1 x 3	1 mask for adults, 1 mask for children and 1 mask for infants
Supraglottic airway device	Center	1 x 5	
Eye irrigator	Center	2	
Biohazard disposal bags	Center	2	Additional equipment in UPK
Absorbent dry powder (i.e. granules)	Center	1(1)	To convert liquid spill into gel
Absorbent tablets	Center	4(1)	To remove spill from carpet
Skin wipes	Center	8(1)	
Note 1: Items moved from the UPK to the FAK as these items have an expiration date allowing for easier follow-up and replacement when due.			

When using the first aid kit, the use (and preferable what has been used) shall be entered in the airplane technical log (ATL). It shall be replenished after use in-flight at the first opportunity where replacement items are available.

10.1.5.3 Pre-flight inspection

Check the correct amount on board, the location according to this section and if stowed properly. Check if the seals are present and are not tampered with. Check the expiration date to be within limits.

10.1.6 Universal precaution kit

10.1.6.1 General

The aircraft is equipped with a universal precaution kit (UPK) easily accessible in the cabin area and inspected on regular basis. It serves to protect a Flight Crew Member or Passenger while treating an unwell Passenger.

The kit shall be sealed so it is easily detectable that something from the kit was used and thus needs to be replaced.

10.1.6.2 Location

The universal precaution kit is located in the lavatory closet under the sink together with the first aid kit (FAK).

10.1.6.3 Operation

► *Refer to the Operations Manuals Part A Section* ***6.2 – Managing a suspected case of communicable disease onboard***

► *Refer to the Operations Manuals Part B Section* ***10.1.7 – Supplemental personal protective equipment***

The universal precaution kit serves to protect a Flight Crew Member or Passenger while treating an unwell Passenger. The kit is most likely to be used as a supplement to the use of the first aid kit (FAK) and contains amongst others the disposable personal protective equipment (PPE) described in the table below.

Table: Universal precaution kit (UPK) content and description

Universal precaution kit (UPK) content and description[1]		
Item	Amount	Remarks
Gown with long sleeves	2	To enhance protection from potential spillage
Disposable apron	1	
Biohazard bag	1	To dispose of waste and used protective gear
Bio scoop with detachable scraper	1	
Shoe covers	1 x 2	To protect from contact with infected material Responders might have stepped over
Non-latex gloves	2 x 1	
Hand sanitizer	1	To be used when standard hand washing facilities are not available
Lavatory label ‘do not use’	3	
Mask with face shield	1	
Mask type N95	2	
Mask type surgical	2	
Odor eliminator	1	
Disposable container	1	Contaminated sharps only
Disinfectant wipes	1 x 20	Germicidal disinfectant wipes for surface cleaning purposes. Do not use on oxidation- sensitive materials such as bronze, copper, brass, nickel or aluminium.
Instructions for use	1	Instructions on how to properly don, remove and dispose of personal protective equipment
Note 1: The universal precaution kit (UPK) contains personal protective equipment (PPE) that is most likely to be required when treating an unwell Passenger. The Company also provides supplemental personal protective equipment for more day-to- day use which is carried on request of the crew or when the situation so requires (i.e. flights to / from high-risk infection areas, pandemic outbreak, etc). For a list of this available equipment, and how to use it, please refer to the section below.		

When using the universal precaution kit, the use (and preferable what has been used) shall be entered in the airplane technical log (ATL).

10.1.6.4 Pre-flight inspection

Check the correct amount on board, the location according to this section and if stowed properly. Check if the seal is present and is not tampered with.

10.1.7 Supplemental personal protective equipment

10.1.7.1 General

► *Refer to the Operations Manuals Part B Section **10.1.6 – Universal precaution kit***

The Company provides optional personal protective equipment (PPE) for each aircraft supplementary to the equipment already contained in the universal precaution kit (UPK) and first aid kit (FAK) and this to protect Flight Crew Members in case of dealing with a suspected case of communicable disease onboard or when operating to / from high-risk infection areas.

The amount and type carried shall depend on the risks involved (i.e. type of flight, destination, etc) and extra equipment may be provided on request of the crew. The equipment is considered non-safety related equipment and hence not depicted in the MEL. If not being used, the equipment shall be carried in a ‘personal protective equipment bag’ provided by the Company for each aircraft.

10.1.7.2 Location

All carried supplemental personal protective equipment, when not being used, shall be stored in a Company personal protective equipment bag. This bag shall be carried being accessible in flight by the crew and preferably located together with the first aid kit and/or universal precaution kit.

10.1.7.3 Operation

The following personal protective equipment (PPE) is typically carried in the Company personal protective equipment bag.

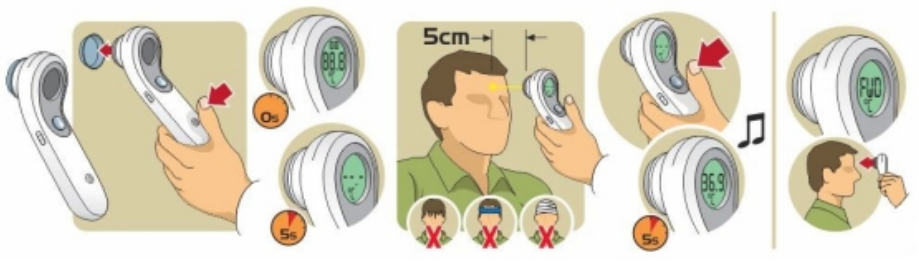
10.1.7.3.1 Digital thermometer

The Company provides a supplemental digital thermometer that measures infrared energy radiated from the skin at the center of the forehead area without actually touching it. This type of thermometer allows for a quick and precise body temperature measurement of, if required, both crew and passengers. To properly measure a temperature:

1. Remove the cap;
2. Press and release the power button once. When the device is ready and correctly positioned (see below), a horizontal line of dashes will appear;
3. Position the device on or up to 5 cm away from the forehead just between the eyebrows. For no touch readings, a guidance light will show you where you are aiming. If the eyebrow area is covered with hair, sweat or dirt, clean the area first;
4. Press the temperature button. The display will show the temperature. If the device was positioned too far away, it will prompt you to move closer by displaying the letters ‘FWD’. Slowly move the device toward the forehead until the line of dashes appears;
5. Press the power button to turn off. The device will also shut off automatically after 60 seconds of no use. Re-install the protective cap.

Refer to the figure below for a graphical presentation on the operation of the digital thermometer.

Figure: Operation of the digital thermometer



The digital thermometer is considered non-safety related equipment and hence not depicted in the MEL. In case the thermometer is missing or inoperative (e.g. due to a flat battery), the Company shall be contacted without delay to have the item replaced. If not being used, it shall be stored in the Company personal protective equipment bag.

10.1.7.3.2 Face masks

The Company has several types of face masks available for use to protect Flight Crew Members in case of dealing with a suspected case of communicable disease onboard or when operating to / from high-risk infection areas.

There are 2 types of face masks available with the following characteristics:

1. Type I (i.e. surgical / medical) disposable face masks which can help protect wearers from getting others sick or reduce the risk of the wearer becoming sick. Flight Crew Members should wear this type of face mask:
    a. When treating an unwell Passenger who is not expected to have a communicable disease;
    b. When being in direct contact with Passengers from high-risk infection areas (e.g. on repatriating flights following a pandemic outbreak) and who don't appear to be unwell;
    c. When performing pre-flight and post-flight duties in and around the aircraft in high-risk infection areas;
2. N95 / FFP2 disposable respirator masks which are typically used by Responders in medical / environmental emergencies. Flight Crew Members shall wear this type of mask when taking care in-flight of an unwell Passenger with a possible communicable disease.

NOTE

'N95' is an American standard for face masks which means that at least 95 % of all air particles are blocked. The norm is similar to the European standard being 'FFP2'.

For any type of face mask, appropriate use and disposal is essential to ensure their effectiveness and to avoid any increase in transmission. The following information on the correct use of a face mask is derived from practices in health care settings:

1. Before putting on a mask, clean hands with alcohol-based hand rub or soap and water;
2. Cover mouth and nose with a mask and make sure there are no gaps between your face and the mask;
3. Avoid touching the mask while using it but if you do, clean your hands with alcohol-based hand rub or soap and water;
4. Replace the mask with a new one as soon as it is damp and do not re-use single-use masks.
5. To remove the mask, remove it from behind (i.e. do not touch the front of mask) by placing a finger or thumb under the straps;
6. Discard immediately and safely in a biohazard bag or equivalent after use;

NOTE

If no biohazard bag is available, place all contaminated PPE in a sealable plastic bag, spray it with disinfecting spray, seal the bag and label it as 'biohazard'.

7. Clean hands with alcohol-based hand rub or soap and water.

Refer to the figures below for a graphical presentation on how to put on and remove the different types of facial masks.

Figure: Putting on a type I face mask



Figure Removing a type I face mask



Figure: Putting on a N95 / FFP2 face mask



Figure: Removing a N95 / FFP2 face mask



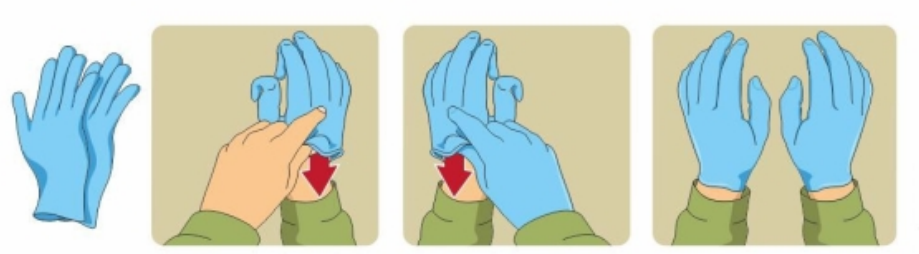
The face masks are considered non-safety related equipment and hence not depicted in the MEL. In case the masks are missing, the Company shall be contacted without delay to have those replaced. If not being used, they shall be stored in the Company personal protective equipment bag.

10.1.7.3.3 Disposable gloves

The Company provides disposable latex gloves which are available for use to protect Flight Crew Members in case of dealing with a suspected case of communicable disease onboard or when operating to / from high-risk infection areas.

When putting on the gloves it is important to extend the glove to cover the wrist of each hand.

Figure: Putting on disposable gloves



When wearing several pieces of personal protective equipment (PPE), the gloves shall be removed first as they are considered a heavily contaminated item. Use of alcohol-based hand rub should be considered before removing the gloves. Remove the gloves by using the following steps:

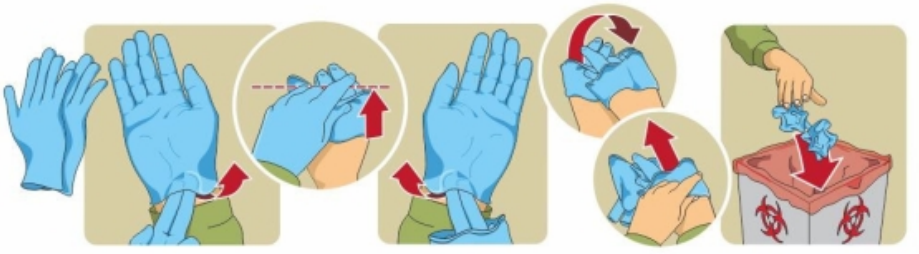
1. Start by pinching and holding the glove (with the other gloved hand) between the palm and wrist area;
2. Peele the glove away from the wrist until it turns inside out covering the fingers;
3. With the now half-gloved hand, pinch and hold the fully gloved hand between the palm and wrist;
4. Peel the glove away from the wrist until it turns inside out and covers the fingers;
5. Now that both hands are half-gloved, remove the glove from one hand completely by grabbing the inside part of the glove and peeling it away from the hand, and do the same for the remaining half-gloved hand using the non- gloved hand, while always grabbing the inside part of the glove;
6. Discard immediately and safely in a biohazard bag or equivalent after use;

NOTE

If no biohazard bag is available, place all contaminated PPE in a sealable plastic bag, spray it with disinfecting spray, seal the bag and label it as 'biohazard'.

7. Clean hands with alcohol-based hand rub or soap and water.

Figure: Removing disposable gloves



The disposable gloves are considered non-safety related equipment and hence not depicted in the MEL. In case the gloves are missing, the Company shall be contacted without delay to have those replaced. If not being used, they shall be stored in the Company personal protective equipment bag.

10.1.7.3.4 Alcohol-based hand rub

The Company provides alcohol-based hand rub (i.e. hand disinfectant) which is available for use to protect Flight Crew Members in case of dealing with a suspected case of communicable disease onboard or when operating to / from high risk infection areas. This alcohol-based hand rub shall assist in maintaining the required hand hygiene when regularly washing your hand with water and soap is not possible.

The hand rub is considered non-safety related equipment and hence not depicted in the MEL. In case the hand rub is missing or almost depleted, the Company shall be contacted without delay to have it replaced. If not being used, they shall be stored in the Company personal protective equipment bag.

10.1.7.4 Pre-flight inspection

As the amount and type of personal protective equipment to be carried is optional, the crew shall determine if the provided equipment is sufficient. Check that the equipment is properly stowed in the Company personal protective equipment bag and that the bag is accessible to the crew during flight.

10.1.8 Flashlight

10.1.8.1 General

There are 2 flashlights (torches) on board. They are normal flashlight with an ON/OFF switch powered by regular batteries for daily use.

10.1.8.2 Location

A flashlight is secured beside each cockpit seat forward of the side document holder (within reach of the applicable Flight Crew Member).

10.1.8.3 Operation

When using a flashlight in the cabin being (partially) filled with smoke, keep the flashlight as close as possible to the cabin floor for optimum use.

10.1.8.4 Pre-flight inspection

Check the correct amount on board, the location according to this section and if all are secured accordingly. Check if they are working properly still giving enough light.

10.1.9 Life jacket cabin (adult / child)

CAT.IDE.A.285 (a), CAT.IDE.A.285 (a) AMC1, CAT.IDE.A.285 (a) AMC2, CAT.IDE.A.285 (b), NCC.IDE.A.220 (a), NCC.IDE.A.220 (b)

10.1.9.1 General

Life jackets are for use in the event of an over-water emergency landing. For every person on board a life jacket shall be carried:

1. When the initial climb out and/or final approach of the aircraft is over water;
2. When flying over water more than 50 NM away from land.

Each life jacket shall be stowed in a position that is readily accessible from the seat or berth of the person, with his safety belt or restraint system fastened, for whose use it shall be provided. Each jacket shall be equipped with a means of electric illumination for the purpose of facilitating the location of the person.

10.1.9.2 Location

Cabin life jackets shall be accessible to the cabin occupant underneath or behind each seat (within reach of the applicable passenger while his seat belt is fastened). The life jacket for the toilet seat is located in the lavatory cabinet below the sink.

10.1.9.3 Operation

The life jacket has a single inflatable chamber providing enough buoyancy to keep a person afloat. The jacket is equipped with a light to locate survivors in the darkness.

The jacket shall be inflated outside the aircraft (when leaving the door), in order not to hinder evacuation and to protect the life jacket from possible damage. To put on the jacket, proceed as follows:

1. Slip your head through the neck-opening;
2. Connect the strap around your back by fastening the buckle;
3. Tighten the strap by pulling the loose end;
4. To inflate the jacket, pull the red inflation tag at the bottom of the jacket (oral inflation is possible by means of an inflation tube);
5. To activate the light, pull the yellow battery tag (the battery works only when emerged in water).

To put on a life jacket on a child, proceed as follows:

1. Put on the life jacket;
2. Bring the strap between the legs of the child. Tighten the strap(s) but not too tight;
3. Pull the red tag standing in the doorway or on the wing.

Refer to the figure below for a graphical presentation on the operation of the adult / child life jacket.

Figure: Operation of the life jacket (adult / child)



10.1.9.4 Pre-flight inspection

Check the correct amount on board, the location according to this section and if stowed properly. Check if the life jacket hasn't been used and/or the bag containing the life jacket hasn't been opened. Check the expiration date to be within limits.

10.1.10 Life jacket cabin (infant)

10.1.10.1 General

Life jackets for infants shall not be part of the standard equipment on board. However, when an infant is on board and a life jacket is required for an adult / child to be available, a jacket shall be provided for every infant.

10.1.10.2 Location

Life jackets for infants, when required, shall be located in the lavatory cabinet.

When an infant is on board, the adult travelling with the infant shall be provided with the infant life jacket and shall be briefed on its operation.

10.1.10.3 Operation

To put on the jacket, proceed as follows:

1. Put both arms in the provided holes;
2. Close the 3 buckles on the back and adjust;
3. Pull down the 2 toggles to inflate.

Please also note that:

1. Infant life jackets are inflated after the complete standstill of the aircraft before evacuation;
2. An adult shall carry the infant while evacuating the aircraft;
3. The adult has to attach the lifeline to his own life jacket outside the aircraft.

Refer to the figure below for a graphical presentation on the operation of the infant life jacket.

Figure: Operation of the life jacket (infant)



10.1.10.4 Pre-flight inspection

Check the correct amount on board (if required) and if distributed accordingly to every passenger carrying an infant. Check if the life jacket hasn't been used and/or the bag containing the life jacket hasn't been opened. Check the expiration date to be within limits.

10.1.11 Life jacket cockpit

10.1.11.1 General

Life jackets for Flight Crew Members shall be available when life jackets for cabin occupants are required.

10.1.11.2 Location

A jacket for every Flight Crew Member is located in the pocket below each cockpit seat (within reach of the applicable Flight Crew Member).

10.1.11.3 Operation

The use shall be the same as life jackets in the cabin to be used by cabin occupants (adult / child).

10.1.11.4 Pre-flight inspection

Check the correct amount on board, the location according to this section and if stowed properly. Check if the life jacket hasn’t been used and/or the bag containing the life jacket hasn’t been opened. Check the expiration date to be within limits.

10.1.12 Life raft

CAT.IDE.A.285 (d), NCC.IDE.A.220 (d)

► *Refer to the Operations Manual Part B Section **2.20 - ETOPS operation***

10.1.12.1 General

► *Refer to the Operations Manual Part A Annex 22 – Risk assessment form life raft SPO / NCC*

Life rafts are for use in the event of an over-water emergency landing.

Regulations for commercial air transport (CAT) operations require that sufficient life rafts shall be carried to carry all persons on board and being of sufficient size to accommodate all survivors in the event of a loss of 1 raft of the largest capacity when flying along a route that contains a point over water at a distance away from land greater than that corresponding to 120 minutes at cruising speed or 400 NM, whichever is lesser, from an adequate aerodrome for making an emergency landing with the critical engine failed. Each life raft shall be stowed in a position so as to facilitate their ready use in an emergency.

NOTE

When a life raft is required to be carried, at least 2 life rafts shall be on board due to the loss of 1 raft requirement and the requirement to carry at least 2 survival ELT's.

Regulations for non-commercial operations with complex motor-powered aircraft (NCC) allow however for some MEL rectification intervals. The PIC of an aircraft operated at a distance away from land where an emergency landing is possible greater than that corresponding to 30 minutes at normal cruising speed or 50 NM, whichever is the lesser, shall determine the risks to survival of the occupants of the aircraft in the event of a ditching, based on which he shall determine the carriage of life rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency. OM-A annex 22 shall be used for this assessment.

10.1.12.2 Location

► *Refer to the Operations Manual Part B Section **1.6.2 - Baggage and storage limitations***

If required, the life raft(s) shall be stowed in the cabin stowage compartment.

10.1.12.3 Operation

Each life raft is composed of 2 identical buoyancy tubes mounted one above the other. An automatically inflatable triple arch supports the self-erecting canopy. The life raft features an inflatable double floor that provides insulation in cold water or, when deflated, maintains the life raft cool in tropical conditions. The canopy may be opened in 3 positions being open (convertible), closed or partially opened (sail).

A ballast system is installed under the floor to add stability in boarding the life raft. A righting line is provided in case the life raft inflates in an inverted position.

Two boarding ladders, one at either end of the life raft, are provided for ease of entering the life raft from the water. In addition, an internal boarding ladder is provided to further assist in boarding the life raft.

The life raft is equipped with an automatic deployable ELT (ELT(AD)), survivor locator light and life-saving equipment (e.g. floating raft knife, sea anchor, etc) to provide the means for sustaining life.

Figure: Winslow life raft



To deploy the life raft, proceed as follows:

1. When an over-water emergency occurs and ditching appears imminent, an Able-Bodied Passenger (ABP) shall remove the raft(s) from its stowage place and secures it convenient to an exit;
2. Open the Velcro painter / mooring line cover on top of the valise and release the snap-hook from the snap-hook loop and snap onto any solid anchor point adjacent to the door or window from which the raft will be launched;
3. Throw out the packed raft clear of the aircraft, it will float;
4. Pull on the painter / mooring line until all of the line has been paid out. A strong, quick pull will then inflate the raft;
5. The painter / mooring line is attached to the raft to keep it from drifting away;
6. After the raft inflates, survivors shall pull it into position at the exit for boarding;
7. If survivors are in the water, the raft may be inflated quickly (without paying out all the painter / mooring line) by pulling the inflation ripcord handle;
8. If the raft should inflate in the inverted position, right the raft according to the righting instructions printed on the lower tube adjacent to the inflation cylinder;
9. Board the raft at either end by using the boarding ladder and handles attached to the raft;
10. After boarding the raft, look for other survivors and assist them in reaching the raft using the heaving-trailing line with floating handle if necessary;
11. Use the hook knife located in the sheath at the entrance to cut the painter / mooring line and free the raft from the aircraft before it submerges;
12. Water inside the raft may be removed using the bailer and the sponge in the equipment pack;
13. Use the hand pump to inflate the inflatable floor. An inflated floor will keep the raft warm. An un-inflated floor will keep the raft cool;
14. Carefully read the instructions in the survival manual to assist your survival.

10.1.12.4 Pre-flight inspection

Check the correct amount on board, the location according to this section and if stowed properly. Check if the life raft hasn’t been used and/or the valise containing the raft hasn’t been opened. Check the expiration date to be within limits.

10.1.13 Protective breathing equipment

CAT.IDE.A.245

10.1.13.1 General

A flight shall not be operated unless it has one portable protective breathing equipment (PBE) on board to protect the eyes, nose and mouth of one Flight Crew Member. It shall provide breathing gas for a period of not less than 15 minutes.

The protective breathing equipment (type Essex) consists of a hood device with 2 integrated oxygen cylinder assemblies. This device permits inspection of the compartment in the event of fire that produces smoke or fumes and is only to be used by a trained Flight Crew Member.

10.1.13.2 Location

One PBE shall be located aft of the left-hand cockpit seat (within reach of at least one Flight Crew Member). In the aircraft with registration OO-NEY, a second PBE is located in the divan right armrest and a third one in the lavatory cabinet below the sink. In the aircraft with registration PH-LGD, a second PBE is located in the left galley cabinet and a third one in the lavatory cabinet below the sink.

10.1.13.3 Operation

Prior to operating, check that the intact vacuum package is guaranteed.

Figure: Essex protective breathing equipment



The sealed barrier pouch containing the Essex protective breathing equipment is easily accessed and removed from its stowage container. Only a small force shall be required to remove the pouch or to lift the lid and break the tamper-evident seal(s).

Once the pouch is removed from its container and opened, oxygen flow is initiated by snapping the two cylinders apart, which in turn activates the flashing green light on the end-of service indicator (EOSI). One bottle releases oxygen rapidly, whereas the second bottle discharges oxygen slowly. An audible hissing sound and inflation of the unit within two minutes indicates the equipment is operating properly.

Once donned, the PBE will protect the wearer for up to 15 minutes. Although both bottles will completely discharge in 8 to 10 minutes, enough oxygen will remain for the full, specified 15 minutes of respiratory protection. When the unit deflates to the point where it touches the wearer’s head and face, or when the red light on the end of service indicator flashes, the unit’s useful life has ended and shall be removed.

The equipment operates at a positive pressure. The neck seal acts as a relief valve to prevent excessive pressure from building up inside the hood.

Please have a look at the figure below for a presentation on the use:

Figure: Operation of the protective breathing equipment



Before activating the oxygen supply, be sure to position the front of the hood correctly. There are two ways to confirm the correct position:

1. If visibility permits, locate the amber-colored, transparent, non-metalized area of the hood. This is the front of the hood. It should not be visible during the activation and donning. The user should see only the metalized area;
2. While grasping the oxygen cylinders (one in each hand), make sure that the thumbs are pointing in the same direction as the oxygen valves (these valves are thinner than the cylinders and will be covered with felt).

10.1.13.4 Pre-flight inspection

Check the correct amount on board, the location according to this section and if stowed properly. Check if the equipment hasn’t been used and/or the bag containing the equipment hasn’t been opened. Check the expiration date to be within limits.

10.1.14 Battery risk management system

► *Refer to the Operations Manuals Part B Section* ***3.2 - Fire and smoke drills***

10.1.14.1 General

The Aircare battery risk management system ‘Firesock’ is made for the transport of lithium battery-powered appliances (laptops, phones, personal electronic devices, etc) in the aircraft. The Firesock system is designed to contain fire in single cell or multiple cell lithium battery packs. The system includes the Firesock containment bag and heat resistant gloves stored in a bag.

The Firesock system may also be used during a lithium battery fire. Water is used for dousing the appliance and stopping thermal runaway. The heat resistance gloves offer extra protection. The Firesock is then used to contain the appliance after the incident so that the crew can focus on emergency procedures surrounding the event.

10.1.14.2 Location

The battery risk management system shall be located behind the right–hand cockpit seat (within reach of at least one Flight Crew Member).

10.1.14.3 Operation

The Firesock may be used to place damaged PED's into for the duration of the flight should they become damaged or crushed.

Figure: Aircare battery risk management system 'Firesock'



If the device is suspected of going into thermal runaway, the BATTERY / PED FIRE / SMOKE procedures shall be followed first before putting it into the Firesock.

CAUTION

It's important to understand that the Firesock does not stop thermal runaway nor does it 'smother' the fire. The Firesock is a containment device that contains heat, debris and reduces the likelihood of secondary fires caused by proximity.

10.1.14.4 Pre-flight inspection

Check the correct amount on board, the location according to this section and if stowed properly. Check if the system hasn't been used.

10.1.15 Smoke goggle

10.1.15.1 General

Smoke goggles are provided for each Flight Crew Member. The goggle lens is of high- grade optics with an anti-abrasion coating on the outside surface and an anti-mist coating on the inside surface.

The quick donning oxygen mask should be worn, if necessary, before the goggles are put on. The smoke goggles and the quick donning oxygen mask shall be designed in such a way that both are compatible to be worn by the Flight Crew Member as one protective breathing equipment unit providing oxygen to the Flight Crew Members on duty in the cockpit protecting eyes, nose and mouth.

Regulations require a minimum of at least 1 smoke goggle for at least every Flight Crew Member to be readily accessible to the Flight Crew Member when seated at his designated station.

10.1.15.2 Location

The goggles are enclosed in a soft bag made of self-extinguishing material and are stored next to each cockpit seat (within reach of the applicable Flight Crew Member).

10.1.15.3 Operation

In case the lens has to be cleaned, a soft cloth shall be used. The equipment shall not be washed with any solvent or detergent. The window of the goggle shall not be wiped when moisture or water is present on the window and this to avoid damaging the anti-mist coating.

10.1.15.4 Pre-flight inspection

Check the correct amount on board, the location according to the layout and if stowed properly. Check if the equipment hasn’t been used or the equipment needs to be cleaned.

10.1.16 Survival equipment

CAT.IDE.A.305, NCC.IDE.A.230

10.1.16.1 General

Survival equipment shall not be part of the standard equipment on board the aircraft. A flight shall not be operated across areas in which search and rescue would be especially difficult unless it has the following equipped:

1. Signaling equipment to make the pyrotechnical distress signals;
2. Additional survival equipment for the route to be flown taking account of the number of persons on board.

10.1.16.2 Location

► *Refer to the Operations Manual Part B Section **1.6.2 - Baggage and storage limitations***

If required, the survival equipment shall be stowed in the cabin stowage compartment.

10.1.16.3 Operation

Prior to all flights requiring survival equipment on board the aircraft, every Flight Crew Member shall ensure complete awareness of the equipment, the location and the operating instructions.

10.1.16.4 Pre-flight inspection

Check if the equipment is on board (if required) and the location. The amount of equipment required for the route to be flown shall be checked for the number of passengers on board.

10.1.17 Cabin seat belt (adult / child)

► *Refer to the Operations Manual Part B Section **1.2 - Seating configuration***

10.1.17.1 General

Every person on board aged 24 months or more shall be seated in a seat equipped with a seat belt.

The Commander (PIC) shall decide when passengers shall fasten their belts during flight. Therefore, he shall turn on the fasten seat belt sign in the cabin, visible to all passengers. In any case, the seat belt sign shall be turned on and hence the seat belts fastened during taxi, take-off and landing. As a Company policy, the seat belt sign shall be on when the aircraft is below 10.000 ft MSL.

For MEL purposes, in case of a missing or inoperative seat belt, refer to the rectification intervals for passenger seats.

10.1.17.2 Location

Every seat in the cabin is equipped with a seat belt. The observer seat (jump seat) is also belted and may be used by a Passenger or Flight Crew Member during all phases of flight.

10.1.17.3 Operation

All passenger seats, except for the toilet seat, are equipped with three-point seat belts, which are attached to the seat structure with hooks. The toilet seat is equipped with only a two-point seat belt, which operates the same.

The seat belt is fastened by fixing one end into the other (fixing the flat end into the buckle end). If not already attached, the upper torso restraint belt shall be attached by using the hook on the flat end of the seat belt. To open, press the button to release the flat end. There is no requirement to unhook the upper torso restraint belt first in order to execute a quick aircraft evacuation.

Refer to the figure below for a graphical presentation on the operation of the adult / child seat belt.

Figure: Operation of a 2-point seat belt (adult / child)

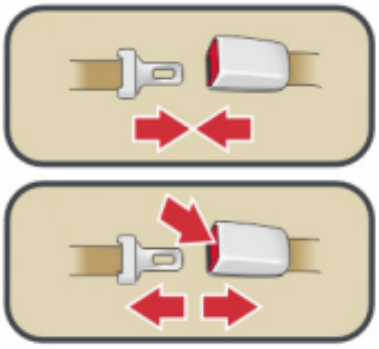
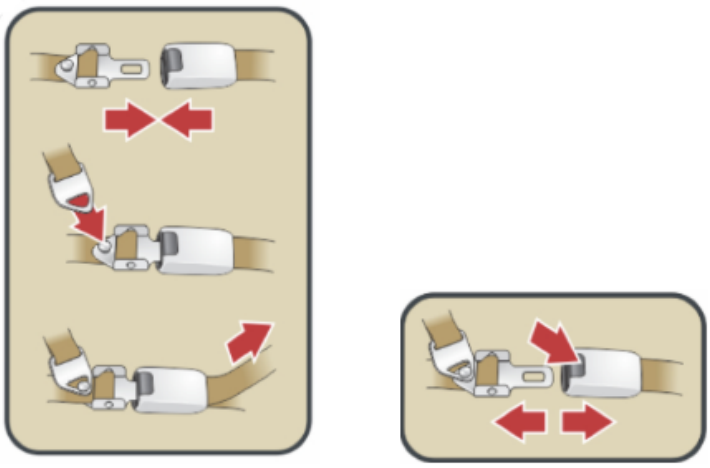


Figure: Operation of a 3-point seat belt (adult / child)



10.1.17.4 Pre-flight inspection

Check that every seat is equipped with a seat belt, that it is properly attached to the seat and that the opening / closing mechanism is working properly. Check that every seat belt sign required is operating accordingly.

10.1.18 Cabin seat belt (infant)

► *Refer to the Operations Manual Part A Section **8.2.2.3 – Infant seating***

10.1.18.1 General

Cabin seat belts for infants or kangaroo belts shall be used to secure infants. Kangaroo belts are however a second choice as they provide less safety than a child restraint device (CRD) on a separate seat.

Kangaroo belts are not part of the standard equipment on board. However, when an infant is to be on board and no CRD is to be used to secure the infant, a kangaroo belt shall be provided for every infant.

The equipment shall be available and serviceable for every infant carried unless a CRD is used.

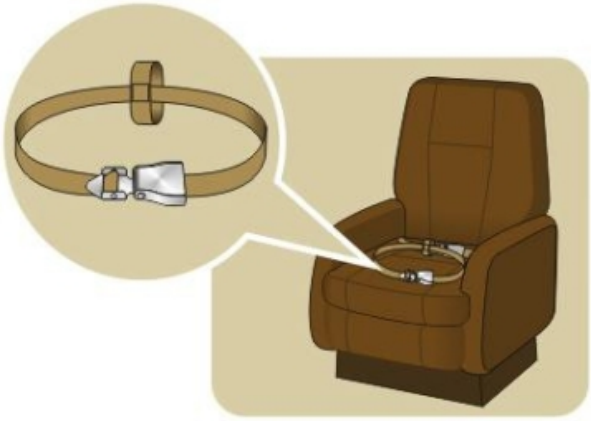
10.1.18.2 Location

Seat belts for infants, when required, shall be located in the lavatory closet. When an infant is on board, the adult travelling with the infant shall be provided with an infant cabin seat belt (if no CRD is being used) and shall briefed on its operation.

10.1.18.3 Operation

Refer to the figure below for a graphical presentation on the operation of the infant seat belt.

Figure: Operation of the seat belt (infant)



10.1.18.4 Pre-flight inspection

A check shall be performed to confirm the correct amount on board (if required) and if distributed accordingly to every passenger carrying an infant. As part of the check, it shall be confirmed that the opening / closing mechanism of the belt is working properly.

10.1.19 Cabin oxygen mask

► *Refer to the Airplane Operations Manual Volume 3 Section 9-14 – Oxygen*

► *Refer to the Operations Manual Part B Section **1.2.3 - Multiple occupancy of a seat***

► *Refer to the Operations Manual Part B Section **10.2 - Amount of oxygen required***

NOTES

- *Do not re-stow masks when no longer needed or after accidental opening of a PSU, as the generator could be hot and cause a fire.*
- *The mask shall only be used in a decompression and must not be used in case of a smoke-filled environment.*

10.1.20 Cockpit oxygen mask

► *Refer to the Airplane Operations Manual Volume 3 Section 9-14 – Oxygen*

► *Refer to the Operations Manual Part B Section **10.2 - Amount of oxygen required***

10.1.21 Passenger safety briefing card

CAT.OP.MPA.170 (b), NCC.OP.140 (a)

► *Refer to the Operations Manual Part A Section **8.3.17.2 – Passenger briefing***

► *Refer to the Operations Manual Part B Annex 3 – Passenger safety briefing card*

10.1.21.1 General

A passenger safety briefing card is a visual means to inform passengers about their safety. It gives them picture-type instructions indicating the operation of safety and emergency equipment and emergency exits likely to be used by passengers.

NOTE

The passenger safety briefing card only depicts the safety and emergency equipment that is available to the passengers in the cabin.

10.1.21.2 Location

At least one passenger safety briefing card shall be available to each individual passenger carried and stowed in a location from where it is easily visible and reachable to the seated passenger and from where it cannot easily fall out.

NOTE

Due to the layout of the cabin, some briefing cards may be in the seat back pocket of the passenger's seat or adjacent to the seat of that passenger. The location of the passenger safety briefing card shall for that reason be properly briefed to the passenger and if necessary, handed over to the passenger for review.

10.1.21.3 Operation

Refer to the applicable annex of this manual for a graphical presentation of the passenger safety briefing card.

10.1.21.4 Pre-flight inspection

Check the correct amount on board and if stowed properly (i.e. as described above).

10.2 Amount of oxygen required

► *Refer to the Airplane Operations Manual Volume 3 Section 9-14 – Oxygen*

SECTION 11 - EMERGENCY EVACUATION PROCEDURES

► *Refer to the Standard Operating Procedures Manual Section 3-10 – Emergency evacuation*

► *Refer to the Standard Operating Procedures Manual Section 3-40 – Ditching and forced landing*

► *Refer to the Operations Manual Part A Section* ***8.3.16 – Cabin safety requirements***

► *Refer to the Operations Manual Part A Section* ***8.3.17 – Passenger briefing procedures and relations with passengers***

► *Refer to the Operations Manual* ***3.15 - Emergency landing & ditching***

This section describes the Company evacuation procedures to be known by every Flight Crew Member.

11.1 Instructions for preparation for an emergency evacuation

An emergency landing or ditching may be planned or unplanned depending on the time available to prepare the aircraft and to inform the passengers.

An unplanned emergency landing or ditching can arise as the result of an emergency either immediately after take-off or when a landing is imminent. There may not be any time to carry out all emergency landing or ditching procedures as described below.

It is at the discretion of the Commander (PIC) to omit certain procedures when deemed necessary due to the lack of time. The procedures below, assume that a reasonable time is available to secure the cabin and inform the passengers besides performing all required cockpit procedures.

11.1.1 Cockpit preparation

The Commander (PIC) shall brief the other Crew Member about the action plan before briefing the passengers or securing the cabin. It is of the utmost importance that both Flight Crew Members are fully aware on the actions to be taken. When preparing the emergency landing or ditching, both Flight Crew Members will perform individual task that shall lead to the same goals as set out in the briefing.

When giving the briefing, the following structure should be used:

1. **N** - Nature of the emergency;
2. **I** - Intention of the Commander (PIC);
3. **T** - Time available;
4. **S** - Special and/or specific instruction.

Once the briefing between the Flight Crew Members is completed, passengers may be briefed and the cabin may be secured.

11.1.2 Emergency landing or ditching briefing

To inform the passengers about the plan of action and the occurrence that took place, the Commander (PIC) shall address the passengers by speaking to them directly or by using the public address system.

To ease the briefing given and to make sure all items are covered during the emergency landing or ditching briefing, the following items shall be covered:

1. Current situation and course of action;
2. Time until the emergency landing or ditching;
3. Seats upright and seat belts fastened;
4. Tables and other items stowed;
5. Sharp objects or loose restrictive clothing removed;
6. Leave all belongings behind;
7. Use of life jackets (in case of ditching);
8. Brace position(s).

After the announcement, the crew shall appear assertive and in control. When securing the cabin, brief passengers again on certain items if in case of doubt they fully understand the instructions given. Pay special attention to the brace position and the use of the seat belt.

11.1.3 Able-bodied passenger briefing

When preparing the cabin for an emergency landing or ditching, at least one Able-Bodied Passenger (ABP) shall be selected. The Able-Bodied Passenger selected shall:

1. Appear calm and in control;
2. Be physically able to open an exit.

If the Able-Bodied Passenger is reluctant to assist, he/she will have to be replaced by a willing Able-Bodied Passenger.

An Able-Bodied Passenger shall be briefed that he/she will be required to assist any Flight Crew Member by:

1. Holding passengers back whilst the exit is being opened;
2. Direct passengers away from the aircraft after exiting.

They shall also be briefed on the actions to be taken in case of crew incapacitation. This includes:

1. Checking for outside hazards before opening an exit;
2. How to open an exit;
3. How to evacuate the other passengers;
4. Location and operation of the survival equipment.

This briefing shall be given in a simple everyday language not using aviation terms. To confirm their understanding, the Able-Bodied Passenger should, time permitting, repeat the instructions given.

11.1.4 Brace position

These general instructions shall be applicable to all brace positions:

1. The lower torso shall be firmly against the seat back;
2. The safety belt shall be worn as tight and as low on the torso as possible. The more tightly the safety belt is adjusted, the better restraint it will provide;
3. If the safety belt includes a shoulder harness, the harness shall be adjusted so that it is tight but does not pull the lap portion of the safety belt upward;
4. The webbing of a safety belt and safety harness shall lie flat against the body and shall not be twisted;
5. Feet shall be flat on the floor and slightly in front of the edge of the occupant's seat, legs and feet shall not be placed under the occupied seat or the seat forward of it in order to prevent feet/leg injury should either seat collapse during impact.

Depending on the seat location of the passengers, they will be briefed on their particular brace position. Note that the aircraft has 3 seating positions:

1. Forward-facing seats,
2. Aft-facing seats,
3. Side-facing seats.

Depending on their position, the specific brace position requirements as described below, shall be briefed additionally to the requirements as set out above.

11.1.4.1 Forward-facing seats

Passengers seated on forward facing seats shall take the following position:

Figure: Forward-facing seats



Bend forward and rest head and chest against the upper legs. Flailing may be reduced by grasping the ankles or legs, or if unable to do so, by wrapping the arms under and around the legs. The head shall be face down in the lap and not turned to one side.

If not possible, bend forward and place hands and arms against the seat in front. As long as hands and/or arms support the head, their exact placement is not important.

11.1.4.2 Aft-facing seats

Passengers seated on aft facing seats shall take the following position:

Figure: Brace position on aft-facing seats



Sit upright with the head firmly against the seat back. Arms may be placed on the armrests. If armrests are not available, hands may be positioned on the lap.

Hands shall not be clasped behind head or neck because this may increase stress on the neck due to the mass of the arms and hands as they react during impact.

11.1.4.3 Side-facing seats

Wherever possible, passengers shall be relocated to forward-facing or aft-facing seats.

When forward-facing or aft-facing seats are not available, passengers seated on side-facing seats shall take the following position:

Figure: Brace position on the toilet seat



Figure: Brace positions on the side-facing divan (if installed)



Bend forward and lean toward the front of the aircraft, then rest the upper torso and head against whatever might be contacted to help reduce the head flailing.

11.1.4.4 Brace position for children

Children shall be seated on aft-facing seats when available.

If no aft-facing seats are available, children occupying passenger seats facing forward or sideways shall adopt the same brace positions as adults. Because of their smaller stature, the flail envelope of children is smaller than that of adults.

The safety belt shall be placed low on the child's torso, just above the legs at the hips. If the safety belt cannot be adjusted so that it is tight on a small child, the child may sit on a pillow or blanket in order to raise the child so that the safety belt will fit securely. The pillow shall not be placed behind the child.

Children seated in a forward-facing seat shall bend forward over the safety belt and rest their head on the seat cushion between their legs or bend their head forward, over the edge of the cushion, as appropriate for their height. This is done to reduce head flailing.

11.1.4.5 Brace position for lap-held infants

► *Refer to the Operations Manual Part B Section **1.2.3 - Multiple occupancy of a seat***

CAUTION

Passengers with lap-held infants shall not be seated on side-facing seats. Passengers with lap-held infants shall be seated in aft facing seats when available.

Figure: Brace position for passengers with lap-held infants on aft-facing seats



If no aft-facing seats are available, passengers with lap-held infants seated on seats facing forward shall take the following position:

Figure: Brace position for passengers with lap-held infants on forward-facing seats



11.1.4.6 Brace position for pregnant women

CAUTION

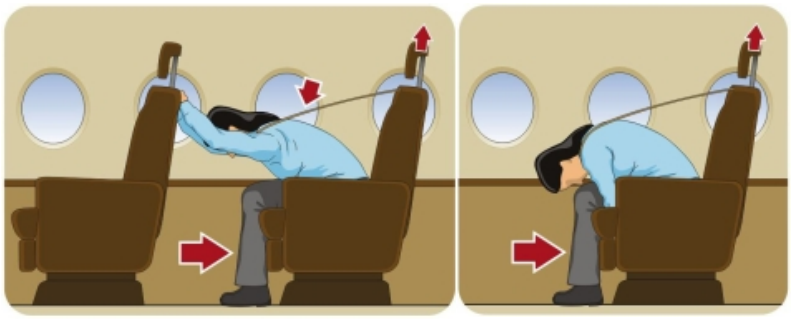
Pregnant women shall not be seated on side-facing seats. **Pregnant women shall be seated in aft facing seats when available**.

Figure: Brace position for pregnant women on aft-facing seats



If no aft facing seats are available, pregnant women seated on seats facing forward shall take the following position:

Figure: Brace position for pregnant women on forward-facing seats



The brace position shall be the same as the normal brace positions. Pregnant women shall be instructed to place the safety belt low, below the abdomen, so that it applies its forces to the pelvis.

11.2 Emergency evacuation procedures

11.2.1 Decision to evacuate

At any time that the Commander (PIC) deems an evacuation is necessary, he shall advise the other Flight Crew Member (SIC) by announcing “EVACUATE”.

It is the responsibility of the Commander (PIC) to assess the situation and execute sound judgment to determine the safest course of action.

Don't hesitate to decide, announce the decision and never interrupt an evacuation procedure. Time spent evaluating the situation should be kept to a minimum to improve chances of survival if an evacuation is required.

11.2.2 Unplanned or planned emergency landing or ditching

11.2.2.1 Unplanned emergency landing or ditching

An unplanned emergency landing or ditching may arise as the result of an emergency either immediately after take-off or when a landing is imminent. There may not be any time to carry out the fully planned emergency landing procedures as set out above.

For an emergency immediately after take-off or when landing or ditching is imminent, the Commander (PIC) shall announce “THIS IS YOUR CAPTAIN SPEAKING, THIS IS AN EMERGENY, BRACE BRACE BRACE”.

11.2.2.2 Planned emergency landing or ditching

For a planned emergency landing or ditching, the amount of preparation shall depend on the time available. If time is available, it is important that the Commander (PIC) briefs the other Flight Crew Member about the action plan before briefing the passengers or securing the cabin. It is of the utmost importance that both Flight Crew Members are fully aware on the actions to be taken.

Once the briefing between the Flight Crew Members is completed, passengers may be briefed and the cabin may be secured.

At 1.000 ft, the Commander (PIC) shall announce “TAKE YOUR SEATS FOR LANDING”. At 200 ft or less than 10 seconds before landing, the announcement “BRACE BRACE BRACE” shall be made.

11.2.3 ATC call when evacuating

The Commander (PIC) shall call ATC when he orders an evacuation, if not already done by the PM as part of the emergency landing preparation.

To avoid possible confusion with the standard words ‘vacating (the runway)’, the word ‘evacuation’ shall be used when calling ATC.

The call "MAYDAY MAYDAY MAYDAY, (callsign), POSITION ..., EVACUATION” shall be made.

11.2.4 Evacuation procedure

The emergency evacuation checklist memory items shall be completed with both Flight Crew Members at their station as some memory items may only be completed by the CM1 (e.g. switching off the batteries) and some may only be completed by the CM2 (e.g. shutting down the APU).

As soon as all required cockpit checklists are performed and the command is given to evacuate, the Flight Crew Member other than the Commander (PIC) shall leave his position to open the emergency exit as dedicated by the Commander (PIC).

In meantime, the Commander (PIC) shall order the evacuation by announcing to the passengers “EVACUATE BY THE … EXIT”.

The dedicated Flight Crew Member shall open the exit to direct and evacuate passengers trough that exit.

CAUTION

After performing the emergency evacuation checklist memory items, the public address system (PA) and/or radios are no longer available to announce the evacuation to the passengers and/or ATC.

The Flight Crew Member assigned to direct an evacuation trough a specific exit, shall:

1. Check the outside conditions before opening an exit to ascertain himself that there is no external fire or smoke in the vicinity of the exit;
2. Open the door only when it is safe to use.

If a hazard exists near the exit, the Flight Crew Member shall redirect the passengers to an appropriate alternate exit.

An emergency evacuation is completed more rapidly when the danger is evident to passengers. Passengers will be more concerned with their possessions than with their own safety unless the danger is immediately apparent or the crew make them very conscious of the dangers.

For that reason, do not waste time using polite long sentences. Use whatever verbal measures required keeping passengers moving. Use even physical force where and if needed.

Stand to the side of an emergency exit so as not to block the available emergency exit area but close enough to the emergency exit to apply assistance or physical force to any passenger.

Once out the aircraft, direct passengers to a secure and protected area away from the aircraft preferably into the wind. Supply any aid that may be necessary and/or practicable. If aid is required, ascertain if there are any doctors among the passengers or passengers which can assist in providing first aid.

Pets shall remain on board until all passengers have evacuated the aircraft. The Commander (PIC) has the final decision when to start the evacuation of pets on board.

After an emergency evacuation and when the basic safety considerations have been completed, every Flight Crew Member shall immediately concern himself about the general welfare of the passengers.

When rescue assistance arrives, ensure an orderly transfer of responsibility of passenger handling. Until such time, the primary responsibility of any Flight Crew Member is the general welfare of the passengers. This responsibility has priority over all other possible duties and responsibilities.

SECTION 12 - AIRCRAFT SYSTEMS

12.1 General

The description of the different aircraft systems may be found in the Aircraft Operations Manual Volume 3.

Some systems and/or equipment however may require some more detailed explanation (e.g. specific description of a certain system and/or equipment); hence they shall be detailed below structured according to the ATA number system.

ANNEX

Annex number	Title	Edition and/or date
1	Supplementary Company checklist E545 / E550	Edition 4 of 09-Jan-23
2	Passenger safety briefing card OO-NEY	Oct 2026
	Passenger safety briefing card PH-LGD	Oct 2026

ANNEX 1: SUPPLEMENTARY COMPANY CHECKLIST E545 / E550

TAKE-OFF BRIEFING 2
APPROACH, LANDING AND GO-AROUND BRIEFING 3
EFB PROCEDURES 4
RNP 4 / RNAV 10 NAT HLA MNPS OPERATION 4
RVSM OPERATION 4
RNAV 5 OPERATION 5
RNAV 1 / RNP 1 OPERATION 5
RNP APCH OPERATION 5
ADS-B OPERATION 5
CPDLC / ADS-C OPERATION 5

BATTERY / PED CHECKLIST 6
EMERGENCY CABIN PREPARATION CHECKLIST 6
SERIOUS INCIDENT / ACCIDENT 'MANIFEST' CHECKLIST 7

LIGHTNING STRIKE 8

TAKE-OFF BRIEFING

Required items to be covered

1. ATIS, NOTAM's and weather;
2. MEL, CDL and DDL items affecting performance;
3. Receiver autonomous integrity monitoring (RAIM) availability (if required);
4. Take-off and landing dispatch conditions;
5. Take-off alternates (if weather required) including return procedures depending on the weather (i.e. VMC or IMC) and aircraft performance (e.g. maximum landing mass) in case of an occurrence after V_1 including occurrences other than an engine failure;
6. Mass and balance;
7. Runway conditions and wind;
8. Take-off data including gross error check;
9. Noise abatement procedure;
10. SID;
11. Engine failure procedures, including engine failure flap retraction altitude (EFFRA) and minimum sector altitude (MSA);
12. Navigation aid setup;
13. Rejected take-off procedures;
14. Taxi routing;
15. Use of EFB and/or IFIS system;
16. 'TWO-C' threats.

APPROACH, LANDING AND GO-AROUND BRIEFING

Required items to be covered

1. Aircraft status;
2. Fuel status;
3. ATIS and weather;
4. NOTAM's;
5. Receiver autonomous integrity monitoring (RAIM) availability (if required);
6. Landing distance at time of arrival (LDTA);
7. Top of descent;
8. Appropriate aerodrome charts;
9. Use of automation;
10. Use of aircraft systems;
11. Landing and stopping;
12. Taxi to gate or stand;
13. Go-around;
14. Alternate;
15. Use of EFB and/or IFIS system;
16. 'TWO-C' threats.

EFB PROCEDURES

COCKPIT PREPARATION

1. Status EFB's ..... CHECKED / CLEANED
2. Status accessories ..... CHECKED
3. Screen brightness ..... AS DESIRED
4. Status EFB battery ..... CHECKED
5. Software and applications ..... UPDATED
6. Operational documents ..... RETREIVED
7. Moving map & ownship position ..... OFF
8. Airplane mode ..... ENGAGED
   a. Cellular mode ..... OFF
   b. Wi-Fi mode ..... OFF
   c. Bluetooth mode ..... OFF

BEFORE TAKE-OFF

1. Jeppesen screen lock ..... ENGAGED

APPROACH

1. Wi-Fi mode ..... OFF
2. Jeppesen screen lock ..... ENGAGED

SHUTDOWN

1. EFB power cables ..... DISCONNECTED

RNP 4 / RNAV 10 NAT HLA MNPS OPERATION

Refer to MEL for more details

1. FMS button on DCP 1
2. AHRS 2
3. Flight phone / SATCOM system 1
4. FMS 2
5. FMS current navigation database 1
6. GPS 2
7. HF 1
8. FANS 1/A+ CPDLC 1
9. TCAS 1

RVSM OPERATION

Refer to MEL for more details

1. Flight director 1
2. AP button on AFCS panel 1
3. ALT button on AFCS panel 1
4. VNAV button on AFCS panel 1
5. FLCH button on AFCS panel 1
6. VS button on AFCS panel 1
7. ADS including primary altimeter indication and pitot heating / pitot static heating system 2
8. ATC transponder 1
9. Autopilot with altitude hold 1
10. Altitude alerting system 1

RNAV 5 OPERATION

Refer to MEL for more details

1. FMS button on DCP 1
2. FMS 1
3. FMS current navigation database 1
4. VOR 1
5. DME 1
6. AHRS 2
7. GPS 1
8. Autopilot in LNAV mode (PF) 1
9. Flight director in LNAV mode (PF) 1
10. Lateral deviation display mode (PF) 1
11. ADS including primary altimeter indication 2

RNAV 1 / RNP 1 OPERATION

Refer to MEL for more details

1. FMS button on DCP 1
2. FMS 1
3. FMS current navigation database 1
4. VOR 1
5. DME 1
6. AHRS 2
7. GPS 1
8. Autopilot in LNAV mode (PF) 1
9. Flight director in LNAV mode (PF) 1
10. Lateral deviation display mode (PF) 1
11. ADS including primary altimeter indication 2

RNP APCH OPERATION

Refer to MEL for more details

1. FMS button on DCP 1
2. APPR mode button on AFCS panel 1
3. FMS 2
4. FMS current navigation database 1
5. GPS 1
6. AHRS 2
7. GPWS glideslope deviation (mode 5) 1
8. Autopilot in LNAV mode (PF) 1
9. Flight director in LNAV mode (PF) 1
10. Lateral deviation display mode (PF) 1
11. ADS including primary altimeter indication 2

ADS-B OPERATION

Refer to MEL for more details

1. GPS 1
2. ATC transponder Mode S with ADS-B 1

CPDLC / ADS-C OPERATION

Refer to MEL for more details

1. VHF 3 1
2. CPDLC system 1

BATTERY / PED CHECKLIST

Refer to Part A and B for more details

DAMAGED / CRUSHED (NO FIRE / SMOKE)

1. Item ..... IDENTIFY
2. Electrical power ..... REMOVE
3. Thermal runaway ..... NO RISK
4. Item ..... STOW IN FIRESOCK

FIRE / SMOKE

1. Item ..... IDENTIFY
2. Firefighting ..... PERFORM
3. Electrical power ..... REMOVE
4. Item ..... DOUSE / COOL
5. Item ..... MONITOR (10 to 15 min)
6. Thermal runaway ..... NO MORE RISK
7. Item ..... STOW IN CONTAINER / FIRESOCK

THERMAL RUNAWAY COCKPIT (NO FIRE / SMOKE)

1. Item ..... IDENTIFY
2. Electrical power ..... REMOVE
3. Fire / smoke ..... NOT VISIBLE
4. Item ..... STOW IN FIRESOCK
5. Item ..... REMOVE FROM COCKPIT
6. Item ..... DOUSE / COOL

EMERGENCY CABIN PREPARATION CHECKLIST

Refer to Part B for more details

STANDARD

1. Passengers ..... INFORMED
2. Exits ..... OBSTACLES REMOVED
3. ABP ..... ADJACENT TO EXITS
4. Emergency equipment ..... ACCESSIBLE
5. FASTEN SEAT BELT SIGN ..... ON
6. Seat belts ..... FASTENED
7. Seat backs ..... UPRIGHT
8. Head rests ..... EXTENDED
9. Tables ..... STOWED
10. Luggage ..... STOWED
11. Personal items ..... REMOVED

DITCHING EXPECTED

1. Life jackets ..... DISTRIBUTED / DO NOT INFLATE
2. Life rafts ..... READY NEAR OVERWING
3. EMERGENCY LIGHT ..... ON

SERIOUS INCIDENT / ACCIDENT 'MANIFEST' CHECKLIST

Refer to Part A for more details

MAYDAY

1. Declare an emergency. Acknowledge the seriousness of the situation.

ABANDON AIRCRAFT

1. Evacuate the aircraft in accordance with AFM and OM procedures.

NOTIFY AUTHORITIES

1. Inform responding Authorities of passenger and crew injuries and arrange medical treatment.

ISOLATE

1. With Authority assistance, isolate and secure the scene.

FIRST AID

1. Render first aid to any injured person. Arrange for medical treatment for passengers and crew whether they appear injured or not.

EYEWITNESS

1. Observe anyone in the area who may be an eyewitness.

SILENCE

1. Other than responding to emergency medical treatment inquiries, do not speak to anyone at the scene.

TEAM

1. Contact the Operational Control Center (OCC) via +31 20 405 66 01.

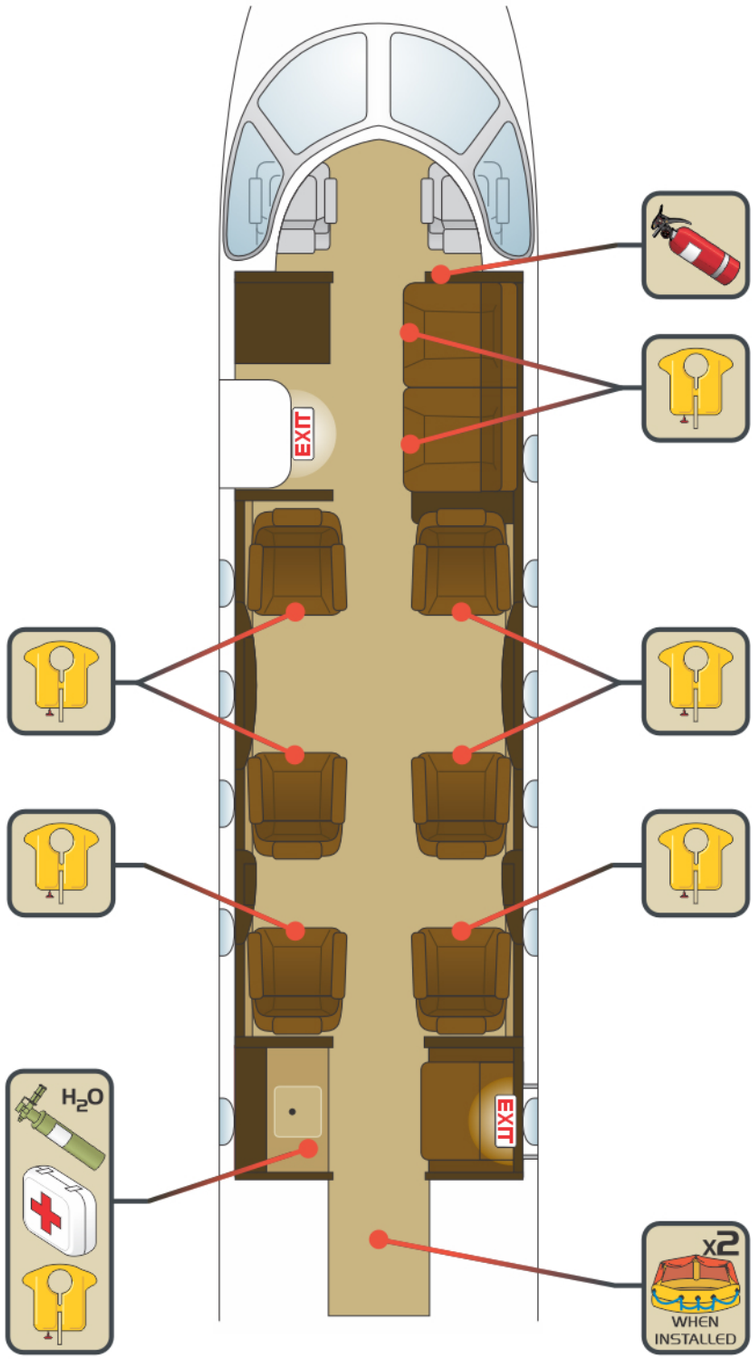
LIGHTNING STRIKE

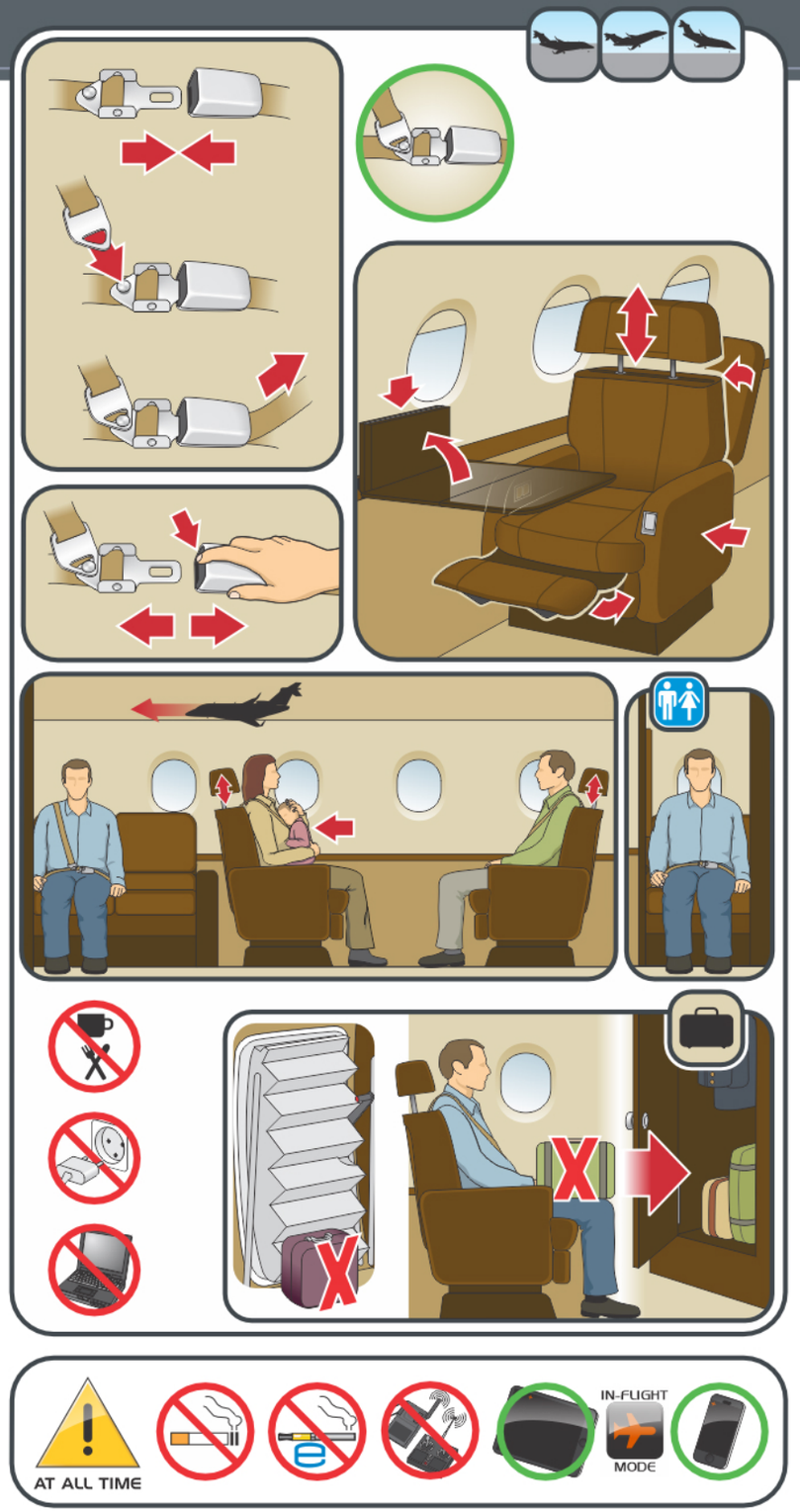
Refer to Part B for more details

AIRCRAFT HIT BY LIGHTNING

1. Circuit breakers ..... CHECK ALL IN
2. Compass & heading ..... NORMAL
3. Engine indications ..... NORMAL
4. Pressurisation ..... NORMAL
5. Flight controls ..... FREE MOVEMENT
6. Fuel system ..... NORMAL / NO LEAKS
7. EFB system ..... NORMAL
8. All other systems ..... NORMAL

ANNEX 2 : PASSENGER SAFETY BRIEFING CARD





ASL GROUP

OO-NEY

55010003



EMBRAER
LEGACY 450

SAFETY INFORMATION

DO NOT REMOVE FROM AIRCRAFT

ASL n. v. Voogdijstraat 29, 3500 Hasselt, Belgium

Revision E, October 2026

Produced by Aeroglyphes, Montreal, Canada

www.aeroglyphes.com

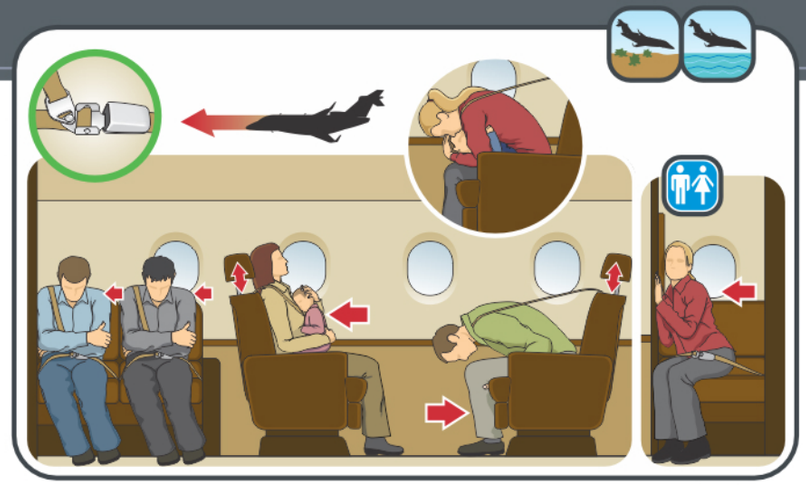
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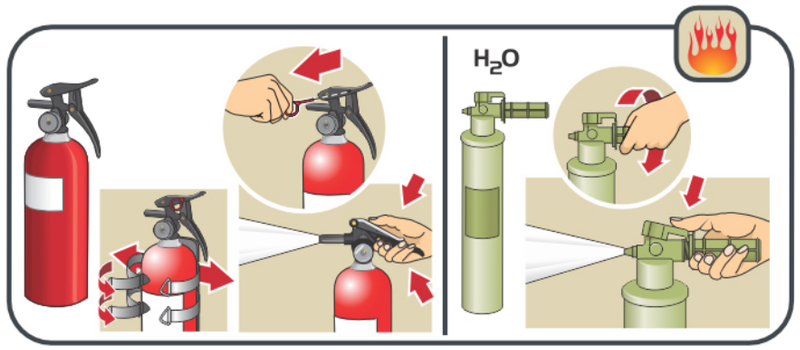
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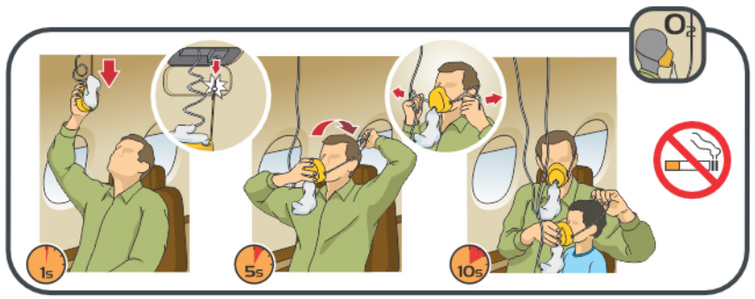


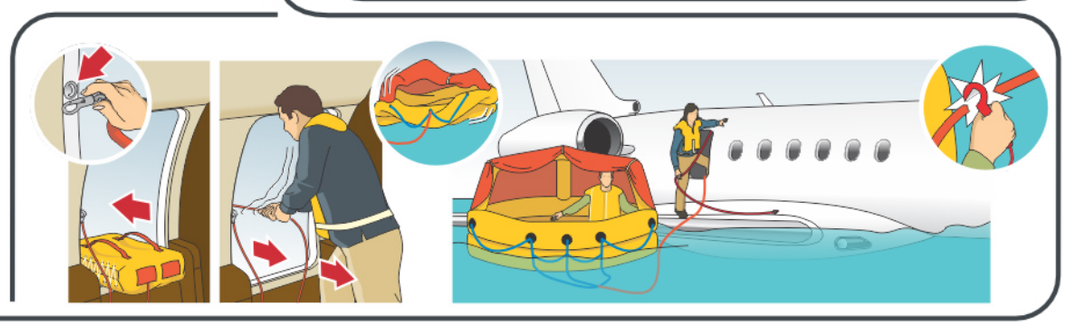


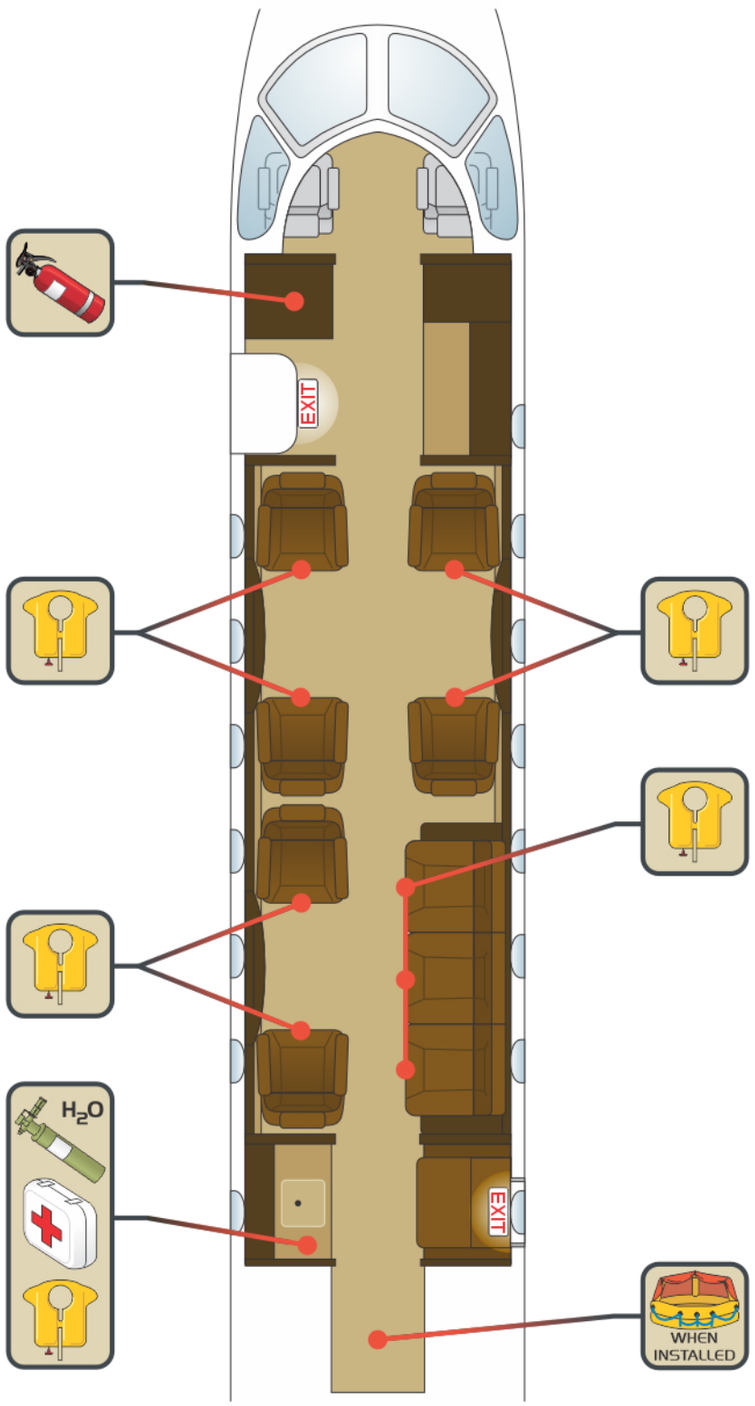


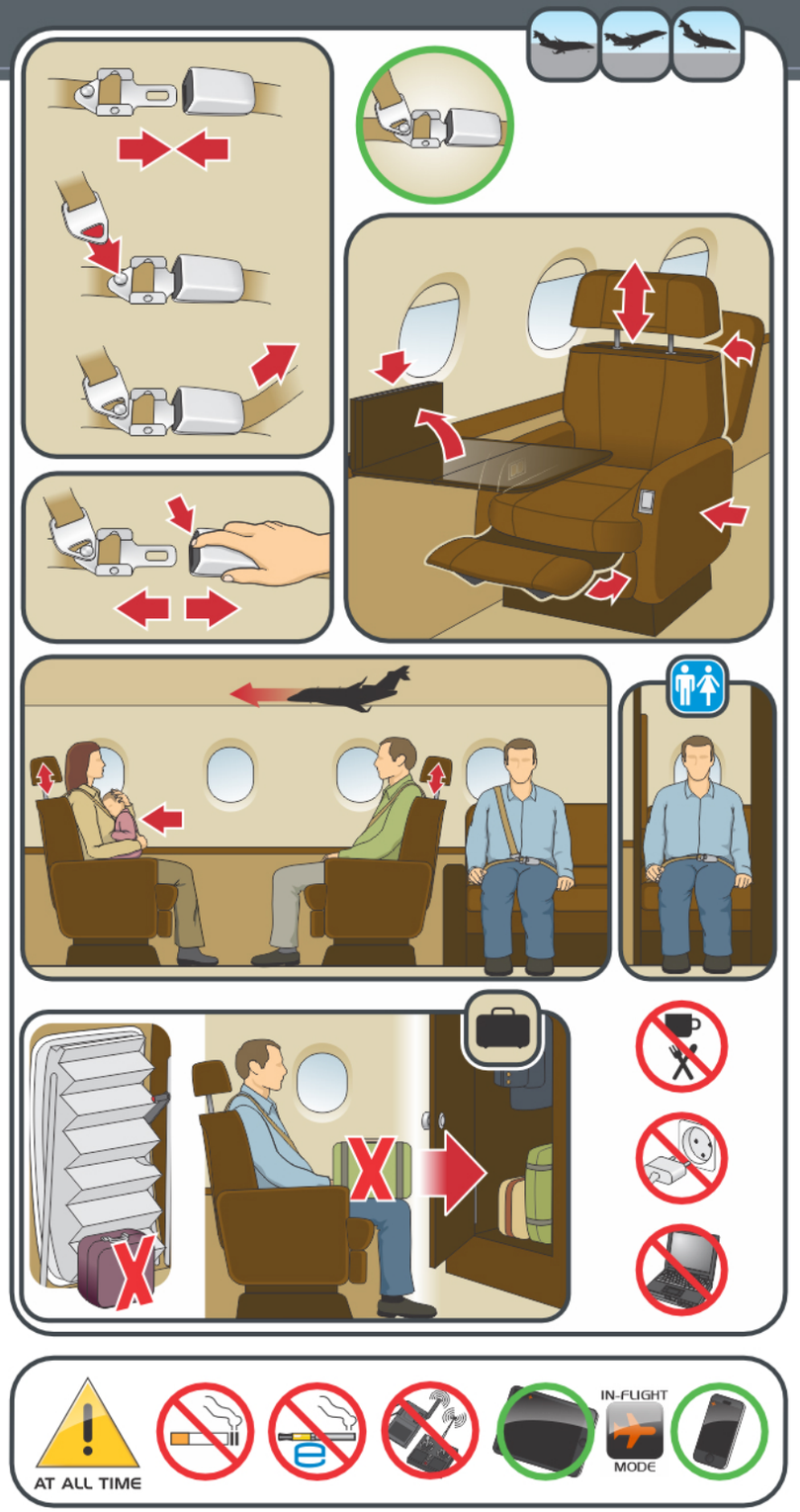












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