KINGDOM OF BAHRAIN
Ministry of Transportation and Telecommunications

مملكة البحرين
وزارة المواصلات والاتصالات

ANTR OPS 3

COMMERCIAL & PRIVATE AIR TRANSPORTATION (HELICOPTER)

FOREWORD

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Bahrain CAA Publication Revisions Highlight Sheet

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The following pages of ANTR IV OPS 3 have been revised to ICAO Annex 6 Part III, 11th Edition dated July 2022.

~~Item~~	~~Paragraph number~~	~~Page~~	~~Reason~~
~~1~~	~~Foreword, Contents (general) and Contents (details)~~	~~i~~	~~To indicate the current revision status.~~
~~Section 1~~			
~~1~~	~~Appendix 1 to ANTR OPS 3.175~~	~~1-C-6~~	~~Added Note 2 for the contents of the AOC as per ICAO standards~~
~~2~~	~~Appendix 2 to ANTR OPS 3.175~~	~~1-C-7~~	~~Introduction of a requirements for third party provision as per ICAO standards~~
~~3~~	~~ANTR OPS 3.210~~	~~1-D-3~~	~~Introduction specific training for personnel as per ICAO standards~~
~~4~~	~~ANTR OPS 3.295~~	~~(1-D-12) to (1-D15)~~	~~Amendment as per the current ICAO standards on selection of Helicopter / landing location~~
~~5~~	~~ANTR OPS 3.430~~	~~(1-E-1) to (1-E-3)~~	~~Amendment as per the current ICAO standards for Helicopter / landing location operating minima~~
~~6~~	~~ANTR OPS 3.700~~	~~(1-K-9) to (1-K-10)~~	~~Amendment as per the current ICAO standards on the required information with respect to FDR system~~
~~7~~	~~ANTR OPS 3.785~~	~~1-K-17~~	~~Amendment as per the current ICAO standards with respect to Automatic Landing System~~
~~8~~	~~ANTR 1 Appendix to ANTR OPS 3.700~~	~~1-K-23~~	~~Amendment as per the current ICAO standards with respect to FDR system calibration~~
~~9~~	~~ANTR OPS 3.941~~	~~(1-N-2) to (1-N-3)~~	~~Amendment as per the current ICAO standards with respect to flight training programme.~~
~~10~~	~~Appendix 1 to ANTR OPS 3.1045~~	~~1-P-13~~	~~Amendment to the Operating Procedure~~
~~11~~	~~ANTR OPS 3.1150~~	~~1-R-1~~	~~Amendment as per the current ICAO standards with respect to safe transportation of dangerous goods~~
~~12~~	~~ANTR OPS 3.1152~~	~~(1-R-1) to (1-R-2)~~	~~Introduction of a new terminology to cover Cargo as per ICAO standards~~
~~13~~	~~ANTR OPS 3.1155~~	~~(1-R-4) to (1-R-5)~~	~~Amendment to regulation to cover safe transportation of dangerous goods as per ICAO standards~~
~~14~~	~~ANTR OPS 3.1160~~	~~1-R-5~~	~~Deletion of outdated regulation reference and giving reference to the appropriate technical instruction of ICAO~~
~~15~~	~~ANTR OPS 3.1165~~	~~1-R-5~~	~~Deletion of irrelevant reference~~

~~16~~	~~ANTR OPS 3.1180~~	~~1-R-5~~	~~Deletion of irrelevant reference~~
~~17~~	~~ANTR OPS 3.1190~~	~~1-R-6~~	~~Introduction of a new regulation to cover the transport of DG with no specific approval~~
~~18~~	~~ANTR OPS 3.1210~~	~~1-R-7~~	~~Reference to the appropriate technical instruction of ICAO~~
~~19~~	~~ANTR OPS 3.1211~~	~~1-R-7~~	~~Introduction of a new regulation to cover the dispensing of DG~~
~~20~~	~~ANTR OPS 3.1215~~	~~1-R-8~~	~~Amended to introduce awareness requirement on DG handling~~
~~Section 2~~			
~~1~~	~~IEM OPS 3.1152(a)~~	~~2-R-1~~	~~Amendment to the reference details~~
~~2~~	~~IEM OPS 3.1160(a)~~	~~2-R-1~~	~~Reference to the appropriate technical instruction of ICAO~~
~~3~~	~~AMC OPS 3.1175~~	~~2-R-2~~	~~Deletion of outdated AMC and giving reference to the appropriate technical instruction of ICAO~~
~~4~~	~~AMC OPS 3.1180(b)~~	~~2-R-2~~	~~Deletion of outdated AMC and giving reference to the appropriate technical instruction of ICAO~~
~~5~~	~~AMC OPS 3.1210(a)~~	~~2-R-2~~	~~Deletion of outdated AMC and giving reference to the appropriate technical instruction of ICAO~~
~~6~~	~~AMC OPS 3.1215(b)~~	~~2-R-2~~	~~Deletion of outdated AMC and giving reference to the appropriate technical instruction of ICAO~~
~~7~~	~~AMC OPS 3.1215(e)~~	~~2-R-2~~	~~Deletion of outdated AMC and giving reference to the appropriate technical instruction of ICAO~~
~~8~~	~~AMC OPS 3.1220~~	~~2-R-2~~	~~Deletion of outdated AMC and giving reference to the appropriate technical instruction of ICAO~~
~~9~~	~~IEM OPS 3.1220~~	~~2-R-2~~	~~Deletion of outdated AMC and giving reference to the appropriate technical instruction of ICAO~~
~~10~~	~~AMC OPS 3.1225~~	~~2-R-2~~	~~Deletion of outdated AMC and giving reference to the updated form used for DG incident / accident~~

Item	Paragraph number	Page	Reason
1	Foreword, Contents (general) and Contents (details)	i	To indicate the current revision status.
Section 1			
1	Revision Highlights		To indicate the applied revisions.
	Index - Contents List		To indicate the current Page number(s)
	Record of Revision		To indicate the current revision
	LEP		To indicate the affected pages
	ANTR OPS 3.003		Introduction of definition for Supernumeraries
	ANTR OPS 3.020		Amendment to the Operator's Responsibility
	ANTR OPS 3.030		Introduction of additional requirements for MEL
	ANTR OPS 3.037		Deletion of applicability date for SMS and incorporation of additional requirements to the Operators
	ANTR OPS 3.050		Amendment to the search & Rescue requirement
	ANTR OPS 3.125		Amendment to add 83 bis and Permit-To-Fly
	ANTR OPS 3.135		Correction to the regulation reference
	ANTR OPS 3.160		Amendment to the requirement for use of Flight Recorder Data
	Appendix 1 to ANTR OPS 3.005(d)		Amendment to the Operations requirement under Performance Class 3 Operations
	Appendix 1 to ANTR OPS 3.125		Incorporation of format for Article 83 bis agreement summary
	ANTR OPS 3.175		Amendment to the general requirement to the AOC / Authorization holders
	Appendix 1 to ANTR OPS 3.175		Amendment to the general requirement to the AOC / Authorization holders
	ANTR OPS 3.230		To Add ICAO DOC references
	ANTR OPS 3.255		To Incorporate conditions referring to relevant regulation
	ANTR OPS 3.285		Incorporate additional requirements on passenger safety
	ANTR OPS 3.290		To incorporate additional requirement on Flight Preparations
	ANTR OPS 3.295		To incorporate additional requirement on VFR
	ANTR OPS 3.320		To incorporate additional requirement on use of safety belts
	ANTR OPS 3.345		Amendment to the ground procedures requirement
	ANTR OPS 3.350		Amendment to the Fuel & Oil requirements
	ANTR OPS 3.370		To add conditions on simulated flights
	ANTR OPS 3.375		Amendment to the Fuel management requirements

	ANTR OPS 3.405		Deletion of irrelevant reference
	ANTR OPS 3.420		To incorporate additional requirement for Occurrence Reporting
	ANTR OPS 3.430		To incorporate current requirement on AWO
	ANTR OPS 3.440		To incorporate current requirement on LVO
	ANTR OPS 3.450		To incorporate current requirement on LVO training & qualification
	ANTR OPS 3.455		To incorporate current requirement on LVO procedures
	Appendix 1 to ANTR OPS 3.430		Concurrent revision commensurate to ANTR OPS 3.455 amendment.
	Appendix 1 to ANTR OPS 3.440		Concurrent revision commensurate to ANTR OPS 3.440 amendment.
	Appendix 1 to ANTR OPS 3.450		Concurrent revision commensurate to ANTR OPS 3.450 amendment.
	Appendix 1 to ANTR OPS 3.455		Concurrent revision commensurate to ANTR OPS 3.455 amendment.
	ANTR OPS 3.470		To give reference to ICAO DOC
	ANTR OPS 3.475		Incorporate current requirement to the performance consideration
	ANTR OPS 3.477		Amended to incorporate current requirements.
	ANTR OPS 3.480		Add additional certification details.
	Appendix 1 to ANTR OPS 3.517(a)		Add reference to the main regulation
	ANTR OPS 3.540		Incorporate current requirement to the performance consideration
	ANTR OPS 3.630		Incorporate current requirement of Instruments required for helicopter operation
	ANTR OPS 3.650		Incorporate current requirement to the performance consideration
	ANTR OPS 3.652		Incorporate current requirement to the IFR
	ANTR OPS 3.665		Incorporate requirement of GPWS
	ANTR OPS 3.700		Incorporate current requirement to the Flight Recorder requirement
	ANTR OPS 3.770		To incorporate the Oxygen requirement corresponding to the altitude
	ANTR OPS 3.830		Incorporate current requirement to the Life-rafts
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	ANTR OPS 3.837		Incorporate current requirement to the helideck operations
	Appendix 1 to ANTR OPS 3.705		Amendment commensurate to the ANTR OPS 3.705 revision
	ANTR OPS 3.845		Incorporate current requirement of equipment required for helicopter operation
	ANTR OPS 3.850		Incorporate current requirement of communication equipment required for helicopter operation
	ANTR OPS 3.860		Incorporate clarification to current requirement of equipment required for helicopter operation
	ANTR OPS 3.865		Give reference to the ICAO DOC for guidance
	ANTR OPS 3.867		Give reference to the ICAO DOC for guidance

	ANTR OPS 3.873		Give reference to the documents for guidance
	Appendix 1 to ANTR OPS 3.1045		Amendment to the Ops Manual procedure requirement
	ANTR OPS 3.1150		Correction to the regulation reference and addition of clarification under Note.
	AMC OPS 3.270		Correction to the Certification Specification acceptable to BCAA
	AMC OPS 3.295		Editorial corrections
	IEM OPS 3.450		Introduction of new IEM in support of ANTR OPS 3.450 giving relevant guidance
	AC OPS 3.475 (c)(3)(ii)		Correction to the Certification Specification acceptable to BCAA
	IEM OPS 3.630		Correction to the Certification Specification acceptable to BCAA
	IEM OPS 3.845		Correction to the Certification Specification acceptable to BCAA
	IEM OPS 3.1040(b)		Correction to regulation reference

FOREWORD

1 The Kingdom of Bahrain Civil Aviation Affairs, known in these regulations as the "BCAA" has implemented ANTR OPS 3 (Air Navigation Technical Regulations – Operations Helicopters) based on the ICAO Annexes, with a view to harmonizing legislation and to regulate commercial air transport and private operations of helicopters.

Note: ICAO Annexes means Annexes to the Chicago Convention.

2 ICAO Annex 6 has been selected to provide the basic structure of ANTR OPS 3 and for Air Operator Certification and Private Operator Authorisation, but with additional sub-division were considered appropriate. The content of Annex 6 has been used and added to where acceptable.

3 The BCAA has adopted associated compliance or interpretative material wherever possible and, unless specifically stated otherwise, clarification will be based on this material or other ICAO documentation.

4 Future development of the requirements of ANTR OPS 3 will be in accordance with Notice of Proposed Amendment (NPA) procedures. These procedures allow for the amendment of ANTR-OPS to be harmonized with amendments to ICAO Annexes and EASA documents in a timely manner.

5 Definitions and abbreviations of terms used in ANTR OPS 3 that are considered generally applicable are contained in Part 1 - Definitions and Abbreviations. However, definitions and abbreviations of terms used in ANTR-OPS that are specific to a Subpart of ANTR-OPS are normally given in the Subpart concerned or, exceptionally, in the associated compliance or interpretative material.

6 The editing practices used in this document are as follows:

(a) 'Shall' is used to indicate a mandatory requirement and may appear in ANTRs.

(b) 'Should' is used to indicate a recommendation and normally appears in AMCs and IEMs.

(c) 'May' is used to indicate discretion by the BCAA, the industry or the applicant, as appropriate.

(d) 'Will' indicates a mandatory requirement and is used to advise of action incumbent on the BCAA.

NOTE: The use of the male gender implies the female gender and vice versa.

7 New, amended and corrected text will be indicated with a side bar beside paragraphs, until a subsequent "amendment" is issued.

8 Section 1 regulations are presented in Times Roman font and Section 2 material presented in Arial font

9 This is 3rd Edition Revision 9 10, dated ~~30 November 2022~~ XX Dec 2023.

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REVISION RECORD

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Revision No.	Date of Issue
3rd Edition Initial Issue	01 August 2010
Revision 1	01 March 2011
Revision 2	01 September 2015
Revision 3	31 July 2017
Revision 4	15 January 2019
Revision 5	31 March 2019
Revision 6	29 March 2020
Revision 7	15 November 2020
Revision 8	17 April 2022
Revision 9	30 November 2022
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2-G-1	31 Jul 17
2-G-2	31 Jul 17
2-G-3	31 Jul 17
2-G-4	31 Jul 17
2-H-1	31 Jul 17
2-H-2	31 Jul 17
2-H-3	31 Jul 17
2-H-4	31 Jul 17
2-H-5	31 Jul 17
2-H-6	31 Jul 17
2-H-7	31 Jul 17
2-H-8	31 Jul 17
2-H-9	31 Jul 17
2-H-10	31 Jul 17
2-H-11	31 Jul 17
2-H-12	31 Jul 17
2-H-13	31 Jul 17
2-H-14	31 Jul 17
2-H-15	31 Jul 17
2-H-16	31 Jul 17
2-H-17	31 Jul 17
2-H-19	31 Jul 17
2-H-20	31 Jul 17
2-H-21	31 Jul 17
2-H-22	31 Jul 17
2-I-1	31 Jul 17
2-I-2	31 Jul 17
2-J-1	31 Jul 17
2-J-2	31 Jul 17
2-J-3	31 Jul 17
2-J-4	31 Jul 17
2-J-5	31 Jul 17
2-J-6	31 Jul 17
2-J-7	31 Jul 17
2-J-8	31 Jul 17
2-K-1	15 Nov 20
2-K-2	15 Nov 20
2-K-3	15 Nov 20
2-K-4	15 Nov 20
2-K-5	15 Nov 20
2-K-6	15 Nov 20
2-K-7	15 Nov 20
2-K-8	15 Nov 20
2-K-9	15 Nov 20
2-K-10	15 Nov 20
2-L-1	31 Mar 19
2-L-2	31 Mar 19
2-M-1	31 Jul 17
2-M-2	31 Jul 17
2-N-1	31 Jul 17
2-N-2	31 Jul 17
2-N-3	31 Jul 17
2-N-4	31 Jul 17
2-N-5	31 Jul 17
2-N-6	31 Jul 17
2-N-7	31 Jul 17
2-N-8	31 Jul 17
2-N-9	31 Jul 17
2-N-10	31 Jul 17
2-O-1	31 Jul 17
2-O-2	31 Jul 17
2-O-3	31 Jul 17
2-O-4	31 Jul 17
2-P-1	17 Apr 22
2-P-2	17 Apr 22
2-P-3	17 Apr 22
2-P-4	17 Apr 22
2-P-5	17 Apr 22
2-P-6	17 Apr 22
2-Q-1	31 Jul 17
2-Q-2	31 Jul 17
2-R-1	30 Nov 22
2-R-2	30 Nov 22
2-R-3	30 Nov 22
1-S-1	31 Jul 17
1-S-2	31 Jul 17

END

SUBPART A – APPLICABILITY

ANTR OPS 3.001 Applicability

(See Appendix 1 to ANTR OPS 3.001)

(a) ANTR OPS 3 prescribes requirements applicable to the operation of any civil helicopter for the purpose of commercial and private air transportation by any operator whose principal place of business is in the Kingdom of Bahrain. ANTR–OPS 3 does not apply;

(1) to helicopters when used in military, customs and police services;

(2) to parachute dropping and fire fighting flights, and to associated positioning and return flights in which the only persons carried are those who would normally be carried on parachute dropping or fire fighting flights; nor

(3) to flights immediately before, during, or immediately after an aerial work activity provided these flights are connected with that aerial work activity and in which, excluding crew members, no more than 6 persons indispensable to the aerial work activity are carried.

ANTR OPS 3.003 Terminology

Terms used in this Subpart and not defined in ANTR OPS 3 have the following meaning:

(a) *Commercial Operator.* A commercial operator is the operator of a helicopter engaged in transportation of passengers, cargo and mail for remuneration or hire offering service to the public.

(b) *Commercial Activities.* Unless otherwise specifically authorized by the BCAA, the following operations are categorized as commercial operations;

(1) Sightseeing flights

(2) Ferry or training flights;

(3) Aerial work operations, including:

(i) Fire suppression

(ii) Agricultural operations

(iii) External load operations

(iv) Aerial photography and survey

(v) Aerial reconnaissance

(vi) Aerial advertising

(vii) Air shows and aerial demonstrations

(viii) Carriage and dropping of parachutists (operator of aircraft)

(ix) Navigation aid calibration

(x) Other activities as determined by the BCAA.

(c) *Operator*. The operator means a person, organization or enterprise engaged in oroffering to engage in a helicopter operation. The definition applies to Private and Commercialoperators as applicable.

(d) *Private Operator*. Private operator means a person, organisation or enterprise engaged in the carriage of persons or cargo not for hire or reward.

(e) **‘Supernumeraries’** – means the person(s) who are not acting in the capacity of a flight crew or a flight attendant and in general, not trained or qualified to act as a flight crew or a flight attendant and not listed on the load manifest as a flight crew member / flight attendant subject to compliance with respective regulation at ANTR OPS 3.

Note: An occupant of an aircraft required for its safe operation that is not a member of the flight or cabin crew. These occupants are limited to live animal handlers, loadmasters, person(s) with duties in respect of a particular shipment on board and maintenance technicians, safety pilots or inspectors from the BCAA.

SUBPART B – GENERAL

ANTR OPS 3.005 General

(a) The operator shall not operate a helicopter for the purpose of commercial or private air transportation other than in accordance with OPS Part 3.

(b) The operator shall comply with the requirements in ANTR- M applicable to helicopters operated for the purpose of commercial air transportation.

(c) Each helicopter shall be operated in compliance with the terms of its Certificate of Airworthiness and within the approved limitations contained in its Helicopter Flight Manual. (See Appendix 1 to ANTR OPS 3.005(c).)

(d) Helicopter Emergency Medical Service (HEMS) operations shall be conducted in accordance with the requirements contained in OPS Part 3 except for the variations contained in Appendix 1 to ANTR OPS 3.005(d) for which a specific approval is required.

(e) Helicopter operations over a hostile environment located outside a congested area shall be conducted in accordance with the requirements contained in OPS Part 3 except for the variations contained in Appendix 1 to ANTR OPS 3.005(e) for which a specific approval is required. This Appendix does not apply to operations conducted in accordance with Appendix 1 to ANTR OPS 3.005(d).

(f) Operations with helicopters with a maximum certificated take-off mass (MCTOM) of 3 175 kg or less; with a maximum approved passenger seating configuration (MAPSC) of 9 or less; by day; and over routes navigated by reference to visual landmarks shall be conducted in accordance with the requirements contained in OPS Part 3 except for the variations contained in Appendix 1 to ANTR OPS 3.005(f) for which a specific approval is required.

(g) Operations with helicopters with a maximum certificated take-off mass (MCTOM) over 3 175kg and a maximum approved passenger seating configuration (MAPSC) of 9 or less; by day; over routes navigated by reference to visual landmarks; and conducted within a local and defined geographical area acceptable to the BCAA, which are intended to startand end at the same location (or at another location acceptable to the BCAA within the local area) on the same day, shall be conducted in accordance with the requirements contained in OPS Part 3 except for the variations contained in Appendix 1 to ANTR OPS 3.005(g) for which a specific approval is required.

(h) Helicopter Hoist Operations shall be conducted in accordance with the requirements contained in ANTR OPS 3 except for the variations contained in Appendix 1 to ANTR OPS 3.005(h) for which a specific approval is required.

(i) Helicopter operations to/from a public interest site shall be conducted in accordance with the requirements contained in ANTR OPS 3 except for the variations contained in Appendix 1 to ANTR OPS 3.005 (i) for which a specific approval is required.

(j) Night VFR operations with the aid of Night Vision Imaging Systems (NVIS) shall only be conducted in accordance with ANTR-OPS 3 and procedures contained in the Operations Manual for which a specific approval is required.

ANTR OPS 3.010 Exemptions
(See AC OPS 3.010)

The BCAA may exceptionally and temporarily grant an exemption from the provisions of OPS Part 3 when satisfied that there is a need and subject to compliance with any supplementary condition the BCAA considers necessary in order to ensure an acceptable level of safety in the particular case.

ANTR OPS 3.015 Operational Directives

(a) The BCAA may direct by means of an Operational Directive that an operation shall be prohibited, limited or subject to certain conditions, in the interests of safe operations.

(b) Operational Directives state:

(1) The reason for issue;

(2) Applicability and duration; and

(3) Action required by the operator(s).

(c) Operational Directives are supplementary to the provisions of ANTR OPS 3.

ANTR OPS 3.020 Laws, Regulations and Procedures - Operator's Responsibilities

(a) The operator must ensure that:

(1) All employees, when abroad, know that they shall comply with the laws, regulations and procedures of those States in which operations are; and

(2) All pilots are familiar with the laws, regulations and procedures pertinent to the performance of their duties, prescribed for the areas to be traversed, the aerodromes/heliports to be used and the air navigation facilities relating thereto.

(3) Other members of the flight crew are familiar with such of these laws, regulations and procedures as are pertinent to the performance of their respective duties in the operation of the helicopter.

Note: Information for pilots and flight operations personnel on flight procedure parameters and operational procedures is contained in PANS-OPS (Doc 8168), Volume I. Criteria for the construction of visual and instrument flight procedures are contained in PANS-OPS (Doc 8168), Volume II. Procedure for Aircraft Operation are contained in PAN-OPS (ICAO DOC 8168), Volume III. Obstacle clearance criteria and procedures used in certain States may differ from PANS-OPS, and knowledge of these differences is important for safety reasons.

(4) The operator or a designated representative shall have responsibility for operational control.

Note: The rights and obligations of a State in respect to the operation of aeroplanes registered in that State are not affected by this provision.

(5) Responsibility for operational control shall be delegated only to the pilot-in-command and to a flight operations officer/flight dispatcher if the operator's approved method of control and supervision of flight operations requires the use of flight operations officer/flight dispatcher personnel.

Note: Guidance on the operational control organization and the role of the flight operations officer/flight dispatcher is contained in the Manual of Procedures for Operations Inspection, Certification and Continued Surveillance *(Doc 8335). Detailed guidance on the authorization, duties and responsibilities of the flight operations officer/flight dispatcher is contained in the* Preparation of an Operations Manual *(Doc 10153). The requirements for age, skill, knowledge and experience for licensed flight operations officers/flight dispatchers are contained in ICAO, Annex 1 and ANTR FCL PART II Chapter-4.*

(6) If an emergency situation which endangers the safety of the helicopter or persons becomes known first to the flight operations officer/flight dispatcher, action by that person in accordance with ANTR OPS 3.207 shall include, where necessary, notification to the appropriate authorities of the nature of the situation without delay, and requests for assistance if required.

(7) If an emergency situation which endangers the safety of the helicopter or persons necessitates the taking of action which involves a violation of local regulations or procedures, the pilot-in-command shall notify the appropriate local authority without delay. If required by the State in which the incident occurs, the pilot-in-command shall submit a report on any such violation to the appropriate authority of such State; in that event, the pilot-in-command shall also submit a copy of it to the State of the Operator. Such reports shall be submitted as soon as possible and normally within ten days.

(8) Operators shall ensure that pilots-in-command have available on board the helicopter all the essential information concerning the search and rescue services in the area over which the aeroplane will be flown.

Note: This information may be made available to the pilot by means of the operations manual or such other means as is considered appropriate.

(9) Operators shall ensure that flight crew members demonstrate the ability to speak and understand the language used for radiotelephony communications as specified in ICAO, Annex 1 *and ANTR FCL PART II Chapter-1*.

ANTR OPS 3.025 Common Language

(a) The operator shall ensure that flight crew members demonstrate the ability to speak and understand the language used for radiotelephony communications as specified in ANTR-FCL 2.

(b) The operator shall ensure that all operations personnel are able to understand the language in which those parts of the Operations Manual which pertain to their duties and responsibilities are written.

(c) Helicopter pilots who are required to use the radio telephone aboard a helicopter shall demonstrate the ability to speak and understand the English language as per ANTR FCL-2.

ANTR OPS 3.030 Minimum Equipment Lists - Operator's Responsibilities

(a) The operator shall establish, for each helicopter, a Minimum Equipment List (MEL) approved by the BCAA. This shall be based upon, but no less restrictive than, the relevant Master Minimum Equipment List (MMEL) (if this exists) accepted by the BCAA.

(b) The operator shall not operate a helicopter other than in accordance with the MEL unless permitted by the BCAA. Any such permission will in no circumstances permit operation outside the constraints of the MMEL.

(c) The operator shall use the MMEL from the State of Design.

(d) the BCAA shall only adopt the MMEL from the State of Design.

ANTR OPS 3.035 Quality System

(a) The operator shall establish one Quality System and designate one Quality Manager to monitor compliance with, and the adequacy of, procedures required to ensure safe operational practices and airworthy helicopters. Compliance monitoring must include a feed-back system to the Accountable Manager (See also ANTR OPS 3.175(h)) to ensure corrective action as necessary.

(b) The Quality System must include a Quality Assurance Programme that contains procedures designed to verify that all operations are being conducted in accordance with all applicable requirements, standards and procedures.

(c) The Quality System and the Quality Manager must be acceptable to the BCAA.

(d) The Quality System must be described in relevant documentation.

(e) Notwithstanding sub-paragraph (a) above, the BCAA may accept the nomination of two Quality Managers, one for operations and one for maintenance, provided that the operator has designated one Quality Management Unit to ensure that the Quality System is applied uniformly throughout the entire operation.

ANTR-OPS 3.037 Safety Management System
(See IEM OPS 3.037)

(a) ~~From 1 January 2011~~ the operator shall implement a safety management system, as specified in ANTR Vol. III Part 19 – Safety Management, acceptable to the BCAA, that as a minimum:

(1) identifies safety hazards;

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

(3) provides for continuous monitoring and regular assessment of the safety level achieved; and

(4) aims to make continuous improvement to the overall level of safety.

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

(c) The System shall include an occurrence reporting scheme to enable the collation and assessment of relevant incident and accident reports in order to identify adverse trends or to address deficiencies in the interests of flight safety. The scheme shall protect the identity of the reporter and include the possibility that reports may be submitted anonymously. (See AC OPS 3.037(c))

(d) The operator of a helicopter of a certified take-off mass in excess of 7 000 kg or having a passenger seating configuration of more than 9 and fitted with a flight data recorder shall establish and maintain a flight data analysis programme as part of its safety management system. (See AC OPS 3.037 (d))

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

(e) The following table provides examples of Flight Data Monitoring (FDM) events that may be further developed using operator and helicopter specific limits. The table is considered illustrative and not exhaustive.

The event and parameter value should be documented and accessible to the flight crew member to give awareness to the reportable exceedance.

Event Group	Description
Take-off Pitch	Pitch rate high on take-off
Height loss in climb-out	Initial climb height loss 20 ft AGL to 400 ft AAL Initial climb height loss 400 ft to 1500 ft AAL
Slow climb-out	Excessive time to 1000 ft AAL after take off
Climb out Speeds	Climb out speed high below 400 ft AAL Climb out speed high 400 ft AAL to 1000 ft AAL Climb out speed low 35 ft AGL to 400 ft AAL Climb out speed low 400 ft AAL to 1500 ft AAL
Go around	Go around below 1000 ft AAL Go around above 1000 ft AAL
Low Approach	Low on approach
Glideslope	Deviation under glideslope
Approach Power	Low power on approach
Approach Speeds	Approach speed high within 90 sec of touchdown Approach speed high below 500 ft AAL Approach speed high below 50 ft AGL Approach speed low within 2 minutes of touchdown
Landing Pitch	Pitch attitude high on landing Pitch attitude low on landing
Bank Angles	Excessive bank below 100 ft AGL Excessive bank 100 ft AGL to 500 ft AAL Excessive bank above 500 ft AGL Excessive bank near ground (below 20 ft AGL)

Normal Acceleration	High normal acceleration on ground High normal acceleration in flight flaps up (+/ increment) High normal acceleration in flight flaps down(+/ increment) High normal acceleration at landing
Ground Proximity Warning	GPWS operation hard warning GPWS operation soft warning GPWS operation windshear warning
TCAS Warning	TCAS operation - Resolution Advisory
Flight Manual Limitations	Vmo exceedence Gear down speed exceedence Gear selection up/down speed exceedence Maximum operating altitude exceedence

(f) The flight data analysis programme shall be non-punitive and contain adequate safeguards to protect the source(s) of the data in accordance with Appendix 3 to Annex 19.

~~*Note: The operator may contract the operation of a flight data analysis programme to another party while retaining overall responsibility for the maintenance of such a programme.*~~
Note: Guidance on the establishment of flight data analysis programmes is included in the Manual on Flight Data Analysis Programmes (FDAP) (Doc 10000).

(g) The operator shall establish a flight safety documents system, for the use and guidance of operational personnel, as part of its safety management system.

Note: Guidance on the development and organization of a flight safety documents system is provided in Attachment D to Annex 19.

(h) Evaluation of relevant information relating to accidents and incidents and the promulgation of related information, shall not be the attribution of blame.

(i) The operator shall manage fatigue risks within the constraints of their approved Flight and Duty Time Schemes. If supplemental mitigations are required for fatigue hazards identified as part of their SMS, operators shall introduce documented company rules to supplement the Flight and Duty Time scheme rules to demonstrably control their fatigue related risks.

(j) The operator, as part of their SMS, shall implement and maintain an updated "Safety Risk Register" accessible to the BCAA, including fatigue hazards (see AC OPS 3.037(i)).

ANTR OPS 3.040 Additional crew members

The operator shall ensure that crew members who are not required flight or cabin crew members, have also been trained in, and are proficient to perform, their assigned duties.

ANTR OPS 3.045 *Intentionally blank*

ANTR OPS 3.050 Search and rescue information

(a) The operator shall ensure that the pilots-in-command have available on board the helicopter all the essential information pertinent to the intended flight concerning search and rescue services in the area over which the helicopter will be flown and is easily accessible in the cockpit.

Note: This information may be made available to the pilot by means of the operations manual *or such other means as is considered appropriate.*

(b) All helicopters on all flights shall be equipped with the ground-air signal codes for search and rescue purposes.

ANTR OPS 3.055 Information on emergency and survival equipment carried

The operator shall ensure that there are available for immediate communication to rescue co-ordination centres, lists containing information on the emergency and survival equipment carried on board all of his helicopters. The information shall include, as applicable, the number, colour and type of life-raftsand pyrotechnics, details of emergency medical supplies, water supplies and the type and frequencies of emergency portable radio equipment.

ANTR OPS 3.060 *Intentionally blank*

ANTR OPS 3.065 Carriage of weapons of war and munitions of war
(See IEM OPS 3.065)

(a) The operator shall not transport weapons of war and munitions of war by air unless an approval to do so has been granted by all States concerned.

(b) The operator shall ensure that weapons of war and munitions of war are:

(1) Stowed in the helicopter in a place which is inaccessible to passengers during flight; and

(2) In the case of firearms, unloaded, unless, before the commencement of the flight, approval has been granted by all States concerned that such weapons of war and munitions of war may be carried in circumstances that differ in part or in total fromthose indicated in this sub-paragraph.

(c) The operator shall ensure that the commander is notified before a flight begins of the details and location on board the helicopter of any weapons of war and munitions of war intended to be carried.

ANTR OPS 3.070 Carriage of sporting weapons and ammunition
(See IEM OPS 3.070)

(a) The operator shall take all reasonable measures to ensure that any sporting weapons intended to be carried by air are reported to him.

(b) The operator accepting the carriage of sporting weapons shall ensure that:

(1) They are stowed in the helicopter in a place which is inaccessible to passengers during flight unless the BCAA has determined that compliance is impracticable and has accepted that other procedures might apply; and

(2) In the case of firearms or other weapons that can contain ammunition, unloaded.

(c) Ammunition for sporting weapons may be carried in passengers' checked baggage, subject to certain limitations, in accordance with the Technical Instructions (see ANTR OPS 3.1160(b)(5)) as defined in ANTR OPS 3.1150(a)(14).

ANTR OPS 3.075 Method of carriage of persons

(a) The operator shall take all reasonable measures to ensure that no person is in any part of a helicopter in flight which is not a part designed for the accommodation of persons unless temporary access has been granted by the commander to any part of the helicopter:

(1) For the purpose of taking action necessary for the safety of the helicopter or of any person, animal or goods therein; or

(2) In which cargo or stores are carried, being a part which is designed to enable a person to have access thereto while the helicopter is in flight.

ANTR OPS 3.080 Offering dangerous goods for transport by air

The operator shall take all reasonable measures to ensure that no person offers or accepts dangerous goods for transport by air unless the person has been trained and the goods are properly classified, documented, certificated, described, packaged, marked, labelled and in a fit condition for transport as required by the Technical Instructions.

ANTR OPS 3.085 Crew responsibilities

(a) A crew member shall be responsible for the proper execution of his duties that:

(1) Are related to the safety of the helicopter and its occupants; and

(2) Are specified in the instructions and procedures laid down in the Operations Manual.

(b) A crew member shall:

(1) Report to the commander any fault, failure, malfunction or defect which he believes may affect the airworthiness or safe operation of the helicopter including emergency systems.

(2) Report to the commander any incident that endangered, or could have endangered, the safety of operation; and

(3) Make use of the operator's occurrence reporting scheme in accordance with ANTR OPS 3.037(a)(2). In all such cases, a copy of the report(s) shall be communicated to the commander concerned.

(c) Nothing in paragraph (b) above shall oblige a crew member to report an occurrence which has already been reported by another crew member.

(d) A crew member shall not perform duties on a helicopter:

(1) While under the influence of any drug or psychoactive substances that may affect his faculties in a manner contrary to safety see also ANTR-FCL 3 (medical) – 3.035 & 3.040;

(2) Until a reasonable time period has elapsed after deep water diving;

(3) Following blood donation except when a reasonable time period has elapsed;

(4) If he is in any doubt of being able to accomplish his assigned duties; or

(5) If he knows or suspects that he is suffering from fatigue, or feels unfit to the extent that the flight may be endangered.

(e) A crew member shall not:

(1) Consume alcohol less than 8 hours prior to the specified reporting time for flight duty or the commencement of standby;

(2) Commence a flight duty period with a blood alcohol level in excess of 0·2 promille;

(3) Consume alcohol during the flight duty period or whilst on standby.

(f) The commander shall:

(1) Be responsible for the safe operation of the helicopter and safety of its occupants and cargo on board from the moment the engine(s) are started until the helicopter finally comes to rest at the end of the flight, with the engine(s) shut down and the rotor blades stopped;

(2) Have authority to give all commands he deems necessary for the purpose of securing the safety of the helicopter and of persons or property carried therein;

(3) Have authority to disembark any person, or any part of the cargo, which, in his opinion, may represent a potential hazard to the safety of the helicopter or its occupants;

(4) Not allow a person to be carried in the helicopter who appears to be under the influence of alcohol or drugs to the extent that the safety of the helicopter or its occupants is likely to be endangered;

(5) Have the right to refuse transportation of inadmissible passengers, deportees or persons in custody if their carriage poses any risk to the safety of the helicopter or its occupants;

(6) Ensure that all passengers are briefed on the location of emergency exits and the location and use of relevant safety and emergency equipment;

(7) Ensure that all operational procedures and check lists are complied with in detail in accordance with the Operations Manual;

(8) Not permit any crew member to perform any activity during a critical phase of flight except those duties required for the safe operation of the helicopter;

(9) Not permit:

(i) A flight data recorder to be disabled, switched off or erased during flight nor permit recorded data to be erased after flight in the event of an accident or an incident subject to mandatory reporting;

(ii) A cockpit voice recorder to be disabled or switched off during flight unless he believes that the recorded data, which otherwise would be erased automatically, should be preserved for incident or accident investigation nor permit recordeddata to be manually erased during or after flight in the event of an accident or an incident subject to mandatory reporting;

(10) Decide whether or not to accept a helicopter with unserviceabilities allowed by the Configuration Deviation List (CDL) or Minimum Equipment List (MEL); and

(11) Ensure that the pre-flight inspection has been carried out.

(12) Ensure that at least one member of the flight crew holds a valid licence authorising operations of the type of radio transmitting equipment to be used.

(g) The commander or the pilot to whom conduct of the flight has been delegated shall, in an emergency situation that requires immediate decision and action, take any action he considers necessary under the circumstances. In such cases he may deviate from rules, operational procedures and methods in the interest of safety.

(h) The pilot-in-command shall be responsible for ensuring that a flight;

(1) will not be commenced if any flight crew member is incapacitated from performing duties by any cause such as injury, sickness, fatigue, the effects of alcohol or drugs; and

(2) will not be continued beyond the nearest suitable heliport or landing location when flight crew members' capacity to perform functions is significantly reduced by impairment of faculties from causes such as fatigue, sickness, lack of oxygen.

ANTR OPS 3.090 Authority of the commander

All persons carried in the helicopter shall obey all lawful commands given by the commander for the purpose of securing the safety of the helicopter and of persons or property carried therein.

ANTR OPS 3.095 *Intentionally blank*

ANTR OPS 3.100 Admission to cockpit

(a) The operator must ensure that no person, other than a flight crew member assigned to a flight, is admitted to, or carried in, the cockpit unless that person is:

(1) An operating crew member;

(2) A representative of the BCAA responsible for certification, licensing or inspection if this is required for the performance of his official duties; or

(3) Permitted by, and carried in accordance with instructions contained in the Operations Manual.

(b) The commander shall ensure that:

(1) In the interests of safety, admission to the cockpit does not cause distraction and/or interfere with the flight's operation; and

(2) All persons carried on the cockpit are made familiar with the relevant safety procedures.

(c) The final decision regarding the admission to the cockpit shall be the responsibility of the commander.

ANTR OPS 3.105 Unauthorised carriage

The operator shall take all reasonable measures to ensure that no person secretes himself or secretes cargo on board a helicopter.

ANTR OPS 3.110 Portable electronic devices
(See AMC OPS 3.110 and IEM OPS 3.110)

The operator shall not permit any person to use, and take all reasonable measures to ensure that no person does use, on board a helicopter a portable electronic device that can adversely affect the performance of the helicopter's systems and equipment.

ANTR OPS 3.115 Alcohol and drugs

The operator shall not permit any person to enter or be in, and take all reasonable measures to ensure that no person enters or is in, a helicopter when under the influence of alcohol or drugs to the extentthat the safety of the helicopter or its occupants is likely to be endangered.

ANTR OPS 3.120 Endangering safety

(a) The operator shall take all reasonable measures to ensure that no person recklessly or negligently acts or omits to act:

(1) So as to endanger a helicopter or person therein;

(2) So as to cause or permit a helicopter to endanger any person or property.

ANTR OPS 3.125 Documents to be carried

(See Appendix 1 to ANTR OPS 3.125)
(See AC OPS 3.125)

(a) The operator shall ensure that the following are carried on each flight:

(1) The Certificate of Registration;

(2) The Certificate of Airworthiness;

(3) The original or copy of the Noise Certificate (if applicable);

(4) The original or copy of the Air Operator Certificate including the operations specifications relevant to the helicopter type, issued in conjunction with the certificate;

(5) The Aircraft Radio Licence;

(6) The original or copy of the third party liability Insurance Certificate(s).

(7) A helicopter, when operating under an Article 83 *bis* agreement entered into between the State of Registry and the State of the Operator, shall carry a certified true copy of the agreement summary, in either an electronic or hard copy format. When the summary is issued in a language other than English, an English translation shall be included.

Note: Guidance concerning the transfer of responsibilities by the State of Registry to the State of the Operator in accordance with Article 83 bis is contained in the Manual on the Implementation of Article 83 bis of the Convention on International Civil Aviation (Doc 10059).

(b) Each flight crew member shall, on each flight when practicable, carry a valid flight crew licence with appropriate rating(s) for the purpose of the flight.

(c) A copy of the Permit To Fly / Special Flight Approval / Authorisation should be on board the aircraft at all times when operating under the terms of the Permit To Fly / Special Flight Approval / Authorisation

ANTR OPS 3.130 Manuals to be carried

(a) The operator shall ensure that:

(1) The current parts of the Operations Manual relevant to the duties of the crew are carried on each flight (See AMC OPS 3.130);

(2) Those parts of the Operations Manual which are required for the conduct of a flight are easily accessible to the crew on board the helicopter; and

(3) The current Helicopter Flight Manual is carried in the helicopter unless the BCAA has accepted that the Operations Manual prescribed in ANTR OPS 3.1045, Appendix 1, Part B, contains relevant information for that helicopter.

ANTR OPS 3.135 Additional information and forms to be carried

(a) The operator shall ensure that, in addition to the documents and manuals prescribed in ANTR OPS 3.125 and ANTR OPS 3.130, the following information and forms, relevant tothe type and area of operation, are carried on each flight:

(1) Operational Flight Plan containing at least the information required in ANTR OPS 3.1060;

(2) Helicopter Technical Log containing at least the information required in ANTR OPS ~~3.915(a)~~ 3.1071;

(3) Details of the filed ATS flight plan;

(4) Appropriate NOTAM/AIS briefing documentation;

(5) Appropriate meteorological information;

(6) Mass and balance documentation as specified in OPS Part 3 Subpart J;

(7) Notification of special categories of passenger such as security personnel, if not considered as crew, handicapped persons, inadmissible passengers, deportees and persons in custody;

(8) Notification of special loads including dangerous goods including written information to the commander as prescribed in ANTR OPS 3.1215(d);

(9) Current maps and charts and associated documents as prescribed in ANTR OPS 3.290(b)(7);

(10) Any other documentation which may be required by the States concerned with this flight, such as cargo manifest, passenger manifest etc; and

(11) Forms to comply with the reporting requirements of the BCAA and the operator.

(b) The BCAA may permit the information detailed in sub-paragraph (a) above, or parts thereof, to be presented in a form other than on printed paper. An acceptable standard of accessibility, usability and reliability must be assured.

ANTR OPS 3.140 Information retained on the ground

(a) The operator shall ensure that:

(1) At least for the duration of each flight or series of flights;

(i) Information relevant to the flight and appropriate for the type of operation is preserved on the ground; and

(ii) The information is retained until it has been duplicated at the place at which it will be stored in accordance with ANTR OPS 3.1065; or, if this is impracticable,

(iii) The same information is carried in a fireproof container in the helicopter.

(b) The information referred to in sub-paragraph (a) above includes:

(1) A copy of the operational flight plan where appropriate;

(2) Copies of the relevant part(s) of the helicopter technical log;

(3) Route specific NOTAM documentation if specifically edited by the operator;

(4) Mass and balance documentation if required (ANTR OPS 3.625 refers); and

(5) Special loads notification.

ANTR OPS 3.145 Power to inspect

The operator shall ensure that any person authorised by the BCAA is permitted at any time to board and fly in any helicopter operated in accordance with an AOC or Authorisation issued by that Authority and to enter and remain in the cockpit provided that the commander may refuse access to the cockpit if, in his opinion, the safety of the helicopter would thereby be endangered.

ANTR OPS 3.150 Production of documentation and records

(a) The operator shall:

(1) Give any person authorised by the BCAA access to any documents and records which are related to flight operations or maintenance; and

(2) Produce all such documents and records, when requested to do so by the BCAA, within a reasonable period of time.

(b) The commander shall, within a reasonable time of being requested to do so by a person authorised by an Authority, produce to that person the documentation required to be carried on board.

ANTR OPS 3.155 Preservation of documentation

(a) The operator shall ensure that:

(1) Any original documentation, or copies thereof, that he is required to preserve is preserved for the required retention period even if he ceases to be the operator of the helicopter; and

(2) Where a crew member, in respect of whom the operator has kept a record in accordance with Subpart Q, becomes a crew member for another operator, that record is made available to the new operator.

ANTR OPS 3.160 Preservation, production and use of flight recorder recordings

(a) *Preservation of recordings* (See IEM OPS 3.160(a)).

(1) Following an accident, the operator of a helicopter on which a flight recorder is carried shall, to the extent possible, preserve the original recorded data pertaining to thataccident, as retained by the recorder for a period of 60 days unless otherwise directed by the investigating authority.

(2) Unless prior permission has been granted by the BCAA, following an incident that is subject to mandatory reporting, the operator of a helicopter on which a flight recorder is carried shall, to the extent possible, preserve the original recorded data pertainingto that incident, as retained by the recorder for a period of 60 days unless otherwise directed by the investigating authority.

(3) Additionally, when the BCAA so directs, the operator of a helicopter on which a flight recorder is carried shall preserve the original recorded data for a period of 60 daysunless otherwise directed by the investigating authority.

(4) When a flight data recorder is required to be carried aboard a helicopter, the operator of that helicopter shall:

(i) Save the recordings for the period of operating time as required by ANTR OPS 3.715 and 3.720 except that, for the purpose of testing and maintaining flight data recorders, up to one hour of the oldest recorded material at the time oftesting may be erased; and

(ii) Keep a document which presents the information necessary to retrieve and convert the stored data into engineering units. The documentation must be updated at regular intervals and shall contain;

(A) flight data recorder parameter allocations;

(B) conversion equations;

(C) periodic calibration records; and

(D) other serviceability/maintenance information.

(iii) At all times preserve a record of not less than one representative flight, that is to say, a recording of a flight made within the last 12 months which includes a take-off, climb, cruise, descent, approach to landing and landing, together with a means of identifying the record with the flight to which it relates.

(b) Operators, not allowed the use of recordings or transcripts of CVR, CARS, Class A AIR and Class A AIRS for purposes other than the investigation of an accident or incident as per Annex 13, except where the recordings or transcripts are:

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

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

iii) used for inspections of flight recorder systems as provided in Section 6 of Appendix 4.

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

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

i) used by the operator for airworthiness or maintenance purposes;

ii) used by the operator in the operation of a flight data analysis programme as provided in Section II of this Annex;

iii) sought for use in proceedings not related to an event involving an accident or incident investigation;

iv) de-identified; or

v) disclosed under secure procedures.

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

(d) *Production of recordings*. The operator of a helicopter on which a flight recorder is carried shall, within a reasonable time after being requested to do so by the BCAA, produce any recording made by a flight recorder which is available or has been preserved.

(e) *Use of recordings*

(1) The cockpit voice recorder recordings may not be used for purposes other than for the investigation of an accident or incident subject to mandatory reporting except with the consent of all crew members concerned.

(2) The flight data recorder recordings may not be used for purposes other than for the investigation of an accident or incident subject to mandatory reporting except when such records are:

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

(ii) De-identified; or

(iii) Disclosed under secure procedures.

ANTR OPS 3.165 Leasing

(a) *Terminology*

Terms used in this sub-paragraph have the following meaning:

(1) *Dry lease* - Is when the helicopter is operated under the AOC or Authorisation of the lessee.

(2) *Wet lease* - Is when the helicopter is operated under the AOC or Authorisation of the lessor.

(b) *Reserved*

(c) *Leasing of helicopters between a Bahraini operator and any entity*

(1) *Dry lease-in*

(i) A Bahraini operator shall not dry lease-in a helicopter from an entity, unless approved by the BCAA. Any conditions which are part of this approval must be included in the lease agreement.

(ii) A Bahraini operator shall ensure that, with regard to helicopters that are dry leased-in, any differences from the requirements prescribed in Subparts K, L, and/or ANTR- M, are notified to and are acceptable to the BCAA.

(2) *Wet lease-in*

(i) A Bahraini operator shall not wet lease-in a helicopter from an entity without the approval of the BCAA.

(ii) A Bahraini operator shall ensure that, with regard to helicopters that are wet leased-in:

(A) The safety standards of the lessor with respect to maintenance and operation are equivalent to CARs;

(B) The lessor is the operator holding an AOC issued by a State which is a signatory to the Chicago Convention:

(C) The helicopter has a standard Certificate of Airworthiness issued in accordance with ICAO Annex 8.

(D) Any requirement made applicable by the lessee's Authority is complied with.

(3) *Dry lease-out*

(i) A Bahraini operator may dry lease-out a helicopter for the purpose of commercial or private air transportation to any operator of a State which issignatory to the Chicago Convention provided that the following conditions are met:

(A) The BCAA has exempted the operator from the relevant provisions of OPS Part 3 and, after the foreign regulatory authority has accepted responsibility in writing for surveillance of the maintenance and operation of the helicopter(s), has removed the helicopter from its AOC; and

(B) The helicopter is maintained according to an approved maintenance programme.

(4) *Wet lease-out*. A Bahraini operator providing a helicopter and complete crew to another entity and retaining all the functions and responsibilities prescribed in Subpart C, shall remain the operator of the helicopter.

(d) *Leasing of helicopters at short notice*. In circumstances where a Bahraini operator is faced with an immediate, urgent and unforeseen need for a replacement helicopter, the approval required by sub-paragraph (c)(2)(i) above may be deemed to have been given provided that:

(1) The lessor is the operator holding an AOC issued by a State which is a signatory to the Chicago Convention; and

(2) The lease-in period does not exceed 14 consecutive days; and

(3) The BCAA is immediately notified of the use of this provision.

ANTR OPS 3.170 *Intentionally blank*

Appendix 1 to ANTR OPS 3.005(c)

Helicopter Flight Manual limitations

(a) For helicopters certificated in Category A, a momentary flight through the height velocity (HV) envelope is allowed during the take-off and landing phases when the helicopter is operated according to any of the following requirements:

(1) ANTR OPS 3.517; or

(2) Appendix 1 to ANTR OPS 3.005(i); or

(3) Appendix 1 to ANTR OPS 3.005(e).

Appendix 1 to ANTR OPS 3.005(d)
Helicopter Emergency Medical Service
(See AC Appendix 1 to ANTR-OPS 3.005(d))

Note: The BCAA is empowered to decide which operation is a HEMS operation in the sense of this Appendix.

(a) *Terminology*

(1) *Ground emergency service personnel*. Any ground emergency service personnel (such as policemen, firemen, etc.) involved with HEMS and whose tasks are to any extent pertinent to helicopter operations.

(2) *HEMS crew member*. A person who is assigned to a HEMS flight for the purpose of attending to any person in need of medical assistance carried in the helicopter and assisting the pilot during the mission. This person is subject to specific training as detailed in sub-paragraph (e)(2) below.

(3) *Helicopter Emergency Medical Service (HEMS) flight*. A flight by a helicopter operating under a HEMS approval, the purpose of which is to facilitate emergency medical assistance, where immediate and rapid transportation is essential, by carrying:

(i) Medical personnel; or

(ii) Medical supplies (equipment, blood, organs, drugs); or

(iii) Ill or injured persons and other persons directly involved.

(See also AC to Appendix 1 to ANTR-OPS 3.005(d), paragraph (a)(4).))

(4) HEMS dispatch centre. A place where, if established, the coordination or control of the HEMS flight takes place. It may be located in a HEMS Operating Base.

(5) *HEMS operating base*. A heliport or landing location at which the HEMS crew members and the HEMS helicopter may be on stand-by for HEMS operations.

(6) *HEMS operating site*. A site selected by the commander during a HEMS flight for HHO, landing and take off (See AC to Appendix 1 to 3.005(d), sub-paragraph 7).

(7) *Medical passenger*. A medical person carried in a helicopter during a HEMS flight, including but not limited to doctors, nurses and paramedics. This passenger shall receive a briefing as detailed in sub-paragraph (e)(3) below.

(b) *Operations Manual*. The operator must ensure that the Operations Manual includes a supplement specifying operational considerations specific to HEMS operations. Relevant extracts from the Operations Manual shall be made available to the organisation for which the HEMS is being provided. (See AC to Appendix 1 to ANTR-OPS 3.005(d) sub-paragraph (b).)

(c) *Operating requirements*

(1) *The helicopter*. Performance Class 3 operations shall not be conducted over a hostile environment.

(2) *Performance requirements*

(i) *Take-off and landing - helicopters with a MTOM of 5 700 kg or less*

(A) Helicopters conducting operations to/from a heliport or landing location at a hospital which is located in a hostile environment, shall be operated in accordance with Subpart G (Performance Class 1) except when the operator holds an approval to operate under Appendix 1 to ANTR-OPS 3.005(i).

(B) Helicopters conducting operations to/from a HEMS operating site located in a hostile environment shall as far as possible be operated in accordance with Subpart G (Performance Class 1). The commander shall make every reasonable effort to minimise the period during which there would be danger to helicopter occupants and persons on the surface in the event of failure of a power (See AC to Appendix 1 to ANTR-OPS 3.005(d) sub-paragraph (c)(2)(i)(B)).

(C) The HEMS operating site must be big enough to provide adequate clearance from all obstructions. For night operations, the site must be illuminated (from the ground or from the helicopter) to enable the site and any obstructions to be identified. (See AC to Appendix 1 to 3.005(d), sub-paragraph (c)(2)(i)(C).)

(D) Guidance on take-off and landing procedures at previously un-surveyed HEMS operating sites shall be contained in the Operations Manual.

(ii) *Take-off and landing - helicopters with a MTOM exceeding 5 700 kg.* Helicopters conducting HEMS shall be operated in accordance with Performance Class 1.

(3) *The crew*. Notwithstanding the requirements prescribed in Subpart N, the following apply to HEMS operations:

(i) *Selection*. The Operations Manual shall contain specific criteria for the selection of flight crew members for the HEMS task, taking previous experience into account.

(ii) *Experience*. The minimum experience level for commanders conducting HEMS flights shall not be less than:

(A) Either:

(A1) 1 000 hours pilot in command of aircraft of which 500 hours is as pilot-in-command on helicopters; or

(A2) 1 000 hours as co-pilot in HEMS operations of which 500 hours is as pilot-in-command under supervision; and, 100 hours pilot-in-command of helicopters.

(B) 500 hours operating experience in helicopters gained in an operational environment similar to the intended (See AC to Appendix 1 to ANTR-OPS 3.005(d) sub-paragraph (c)(3)(ii)(B)); and

(C) For pilots engaged in night operations, 20 hours VMC at night as pilot-in-command; and

(D) Successful completion of training in accordance with sub-paragraph (e) of this Appendix.

(iii) *Recency*. All pilots conducting HEMS operations shall have completed a minimum of 30 minutes flight by sole reference to instruments in a helicopter or in a synthetictraining device (FSTD) within the last 6 months. (See AC to Appendix 1 to ANTR-OPS 3.005(d) subparagraph (c)(3)(iii).)

(iv) *Crew composition.* See AC to Appendix 1 to ANTR-OPS 3.005(d), subparagraph (c)(3)(iv);

(A) *Day flight*. The minimum crew by day shall be one pilot and one HEMS crew member. This can be reduced to one pilot only in exceptional circumstances.

(B) *Night flight*. The minimum crew by night shall be two pilots. However,one pilot and one HEMS crew member may be employed in specific geographical areas defined by the operator in the Operations Manual to the satisfaction of the BCAA taking into account the following:

(B1) Adequate ground reference;

(B2) Flight following system for the duration of the HEMS mission (see AMC to Appendix 1 to ANR-OPS 3.005(d), sub-paragraph (c)(3)(iv)(B)(B2));

(B3) Reliability of weather reporting facilities;

(B4) HEMS minimum equipment list;

(B5) Continuity of a crew concept;

(B6) Minimum crew qualification, initial and recurrent training;

(B7) Operating procedures, including crew co-ordination;

(B8) Weather minima;

(B9) Additional considerations due to specific local conditions.

(4) *HEMS operating minima.*

(i) *Performance Class 1 and 2 operations*. The weather minima for the despatch and en-route phase of a HEMS flight are shown in the following Table. In the event that during the en-route phase the weather conditions fall below the cloud base or visibility minima shown, VMC only capable helicopters must abandonthe flight or return to base. Helicopters equipped and certificated for IMC Operations may abandon the flight, return to base or convert in all respects to a flight conducted under IFR, provided the flight crew are suitably qualified.

Table 1 - HEMS operating minima

2 PILOTS		1 PILOTS	
DAY			
Ceiling	Visibility	Ceiling	Visibility
500 ft and above	(See ANTR OPS 3.465)	500 ft and above	(See ANTR OPS 3.465)
499–400 ft	1 000m (Note 1)	499–400 ft	2 000 m
399–300 ft	2 000 m	399–300 ft	3 000 m
NIGHT			
Cloud base	Visibility	Cloud base	Visibility
1 200 ft (Note 2)	2 500 m	1 200 ft (Note 2)	3 000 m

Note 1: Visibility may be reduced to 800 m for short periods when in sight of land if the helicopter is manoeuvred at a speed that will give adequate opportunity to observe any obstacles in time to avoid a collision. (See AC OPS 3.465.)

Note 2: Cloud base may be reduced to 1000 ft for short periods.

(ii) *Performance Class 3 operations.* The weather minima for the despatch and en-route phase of a HEMS flight shall be a cloud ceiling of 600 ft and a visibility of 1 500 m. Visibility may be reduced to 800 m for short periods when in sight of land if the helicopter is manoeuvred at a speed that will give adequate opportunity to observe any obstacle and avoid a collision. *(See AC OPS 3.465.)*

(d) *Additional requirements*

(1) *Helicopter medical equipment*

(i) The installation of all helicopter dedicated medical equipment and, where appropriate, its operation including any subsequent modifications shall be approved.

(ii) The operator shall ensure that procedures are established for the use of portable equipment on board.

(2) *Helicopter communication and navigation equipment*. Helicopters conducting HEMS flights shall be provided with communications equipment, in addition to that required by ANTR OPS 3, Subpart L, capable of conducting two-way communication with the organisation for which the HEMS is being provided and, where possible, to communicate with ground emergency service personnel. Any such additional equipment will require airworthiness approval.

(3) *HEMS operating base facilities*

(i) If crew members are required to be on standby with a reaction time of less than 45 minutes, dedicated suitable accommodation shall be provided close to each operating base.

(ii) At each operating base the pilots shall be provided with facilities for obtaining current and forecast weather information and shall be provided with satisfactory communications with the appropriate ATS unit. Satisfactory facilities shall be available for the planning of all tasks.

(4) *Refuelling with passengers on board*. When the commander considers refuelling with passengers on board to be necessary, it can be undertaken either rotors stopped orrotors turning provided the following requirements are met:

(i) Door(s) on the refuelling side of the helicopter shall remain closed;

(ii) Door(s) on the non-refuelling side of the helicopter shall remain open, weather permitting;

(iii) Fire fighting facilities of the appropriate scale shall be positioned so as to be immediately available in the event of a fire; and

(iv) Sufficient personnel shall be immediately available to move patients clear of the helicopter in the event of a fire.

(e) *Training and checking*

(1) *Flight crew members*

(i) OPS Part 3 Subpart N training with the following additional items:

(A) Meteorological training concentrating on the understanding and interpretation of available weather information;

(B) Preparing the helicopter and specialist medical equipment for subsequent HEMS departure;

(C) Practice of HEMS departures;

(D) The assessment from the air of the suitability of HEMS operating sites; and

(E) The medical effects air transport may have on the patient.

(ii) OPS Part 3 Subpart N checking with the following additional items:

(A) VMC proficiency day and/or night checks as appropriate including flying landing and take-off profiles likely to be used at HEMS operating sites.

(B) Line checks with special emphasis on the following (See IEM to Appendix 1 to ANTR OPS 3.005(d) (e)(1)(ii)(B):

(B1) Local area meteorology;

(B2) HEMS flight planning;

(B3) HEMS departures;

(B4) The selection from the air of HEMS operating sites;

(B5) Low level flight in poor weather; and

(B6) Familiarity with established HEMS operating sites in operators local area register.

(2) *HEMS crew member*. The HEMS crew member shall be trained in accordance with the requirements of Subpart O with the following additional items:

(i) Duties in the HEMS role;

(ii) Navigation (map reading, navigation aid principles and use);

(iii) Operation of radio equipment;

(iv) Use of onboard medical equipment;

(v) Preparing the helicopter and specialist medical equipment for subsequent HEMS departure;

(vi) Instrument reading, warnings, use of normal and emergency check lists in assistance of the pilot as required;

(vii) Basic understanding of the helicopter type in terms of location and design of normal and emergency systems and equipment;

(viii) Crew coordination;

(ix) Practice of response to HEMS call out;

(x) Conducting refuelling and rotors running refuelling;

(xi) HEMS operating site selection and use;

(xii) Techniques for handling patients, the medical consequences of air transport and some knowledge of hospital casualty reception;

(xiii) Marshalling signals;

(xiv) Under slung load operations as appropriate;

(xv) Winch operations as appropriate;

(xvi) The dangers to self and others of rotor running helicopters including loading of patients;

(xvii) The use of the helicopter inter-communications system.

(3) *Medical passengers*. Prior to any HEMS flight, or series of flights, medical passengers shall be briefed on the following:

(i) Familiarisation with the helicopter type(s) operated;

(ii) Entry and exit under normal and emergency conditions both for self and patients;

(iii) Use of the relevant onboard specialist medical equipment;

(iv) The need for the commander’s approval prior to use of specialised equipment;

(v) Method of supervision of other medical staff;

(vi) The use of helicopter inter-communication systems; and

(vii) Location and use of onboard fire extinguishers.

(4) *Ground emergency service personnel*. The operator shall take all reasonable measures to ensure that ground emergency service personnel are familiar with the following (see IEM to Appendix 1 to ANTR OPS 3.005(d), sub-paragraph (e)(4)):

(i) Two way radio communication procedures with helicopters;

(ii) The selection of suitable HEMS operating sites for HEMS flights;

(iii) The physical danger areas of helicopters;

(iv) Crowd control in respect of helicopter operations; and

(v) The evacuation of helicopter occupants following an on-site helicopter accident.

Appendix 1 to ANTR OPS 3.005(e)
Helicopter operations over a hostile environment located outside a congested area
(See IEM to Appendix 1 to ANTR-OPS 3.005(e))

(a) *Approval.* The operator wishing to conduct operations in accordance with this Appendix must have the prior approval of the authority issuing the AOC and the authority of the Statein which it is intended to conduct such operations. Such an approval will specify:

(1) The type of helicopter; and

(2) The type of operation.

(b) *Applicability*. This Appendix shall only be applicable to turbine-powered helicopters operating over a hostile environment located outside a congested area where it has been substantiated that helicopter limitations, or other justifiable considerations, preclude the use of the appropriate performance criteria.

(c) *Performance Class 2 alleviation.* Helicopters operating in Performance Class 2 over a hostile environment located outside a congested area and with a maximum approved passenger seating configuration (MAPSC) of 9 or less passengers are exempt from thefollowing requirements of OPS Part 3, Subpart H:

(1) ANTR OPS 3.520(a)(2);

(2) ANTR OPS 3.535(a)(2).

(d) *Performance Class 3 alleviation.* Helicopters operating in Performance Class 3 over ahostile environment located outside a congested area and with a maximum approved passenger seating configuration (MAPSC) of 6 or less are exempt from the requirement of ANTR OPS 3.240(a)(5) provided that the operator complies with Appendix 1 to ANTR- OPS 3.517(a),sub-paragraphs (a)(2)(i) & (ii).

(e) *Operation*. Specific procedures to be followed in the event of a power unit failure during take-off and landing must be established in the Operations Manual.

(f) *Supplemental Oxygen for non-pressurised helicopters.* Operations may be conducted with non-pressurised helicopters at pressure altitudes above 10 000 ft without the provision of supplemental oxygen equipment capable of storing and dispensing the oxygen supplies required, provided the cabin altitude does not exceed 10 000 ft for a period in excess of 30 minutes and never exceeds 13 000 ft pressure altitude.

Appendix 1 to ANTR OPS 3.005(f)

Operations for small helicopters (VFR day only)

(a) *Terminology.*

(1) Local Operations. Flight conducted within a local and defined geographical area acceptable to the BCAA, which start and end at the same location on the same day.

(b) *Approval*. The operator wishing to conduct operations in accordance with this Appendix must have the prior approval of the authority issuing the AOC. Such an approval shall specify:

(1) The type of helicopter; and

(2) The type of operation.

(3) The geographical limitations of local operations in the context of this appendix (see AC to Appendix 1 to ANTR-OPS 3.005(f) paragraph (b)(3)).

(c) *Prohibition.* The following activities are prohibited:

(1) ANTR OPS 3.065. Carriage of weapons of war and munitions of war.

(2) ANTR OPS 3.265. Carriage of inadmissible passengers, deportees or persons in custody.

(3) ANTR OPS 3.305. Refuelling/de-fuelling with passengers embarking, on board or disembarking.

(4) ANTR OPS 3.335. Smoking on board.

(d) *Alleviation.* The following rules are alleviated:

(1) ANTR OPS 3.100 Admission to cockpit:

(i) The operator must establish rules for the carriage of passengers in a pilot seat, if applicable.

(ii) The commander must ensure that:

(A) carriage of passengers in the pilot seat does not cause distraction and/or interference with the flight's operation; and

(B) the passenger occupying a pilot seat is made familiar with the relevant restrictions and safety procedures.

(2) ANTR OPS 3.135 Additional information and forms to be carried.

(i) For local operations the following documents need not be carried:

(A) ANTR OPS 3.135(a)(1) - Operational Flight Plan

(B) ANTR OPS 3.135(a)(2) - Technical Log (except where required for land-away)

(C) ANTR OPS 3.135(a)(4) - Notam/AIS documentation

(D) ANTR OPS 3.135(a)(5) - Meteorological information

(E) ANTR OPS 3.135(a)(7) - Notification of special passengers, etc.

(F) ANTR OPS 3.135(a)(8) - Notification of special loads, etc.

(ii) For non-local operations:

(A) ANTR OPS 3.135(a)(1) - Operational Flight Plan. The flight plan may be in a simplified form, relevant to the kind of operations conducted andacceptable to the BCAA.

(B) ANTR OPS 3.135(a)(7) - Notification of special passengers. Is not required.

(3) ANTR OPS 3.140 Information retained on the ground. Information need not be retained on the ground when other methods of recording are employed.

(4) ANTR OPS 3.165 Leasing. Applicable only where formal leasing agreement exists.

Note: The case where the contract to carry the passengers are transferred to another operator to whom the passengers will pay for the transport, is not considered as leasing.

(5) ANTR OPS 3.215 Use of Air Traffic Services. Not applicable unless mandated by air space requirements and providing search and rescue service arrangements are acceptable to the BCAA.

(6) ANTR OPS 3.220 Authorisation of Heliports or Landing Locations by the operator. The operator shall establish a procedure to qualify the Commanders for the selection of heliports or landing locations, suitable for the type of helicopter and the type of operation.

(7) ANTR OPS 3.255 Fuel policy. Subparagraphs (b) to (d) are not applicable when the fuel policy prescribed in ANTR OPS 3.255(a) ensures that, on completion of the flight, or series of flights, the fuel remaining is not less than an amount of fuel sufficient for 30 minutes flying time at normal cruising (this may be reduced to 20 minutes when operating within an area providing continuous and suitable precautionary landing sites). Final reserve fuel must be specified in the operations manual in order to be able to comply with ANTR OPS 3.375(c).

(8) ANTR OPS 3.280 Passenger seating. Procedures are not required to be established.

Note: The intent of this paragraph is achieved by the pilot using normal judgement. ANTR OPS 3.260 is applicable and is considered to address the need for procedures.

(9) ANTR OPS 3.285 Passenger briefing.

(i) Paragraph (a)(1). Unless to do so would be unsafe, passengers are verbally briefed about safety matters, parts or all of which may be given by an audio- visual presentation. Prior approval must be given for the use of portable electronic devices.

(10) ANTR OPS 3.290 Flight preparation.

(i) For local operations:

(A) ANTR OPS 3.290(a). An operational flight plan is not required.

(ii) For non-local operations:

(A) ANTR OPS 3.290(a). An operational flight plan may be prepared in a simplified form relevant to the kind of operation.

(11) ANTR OPS 3.375 In-flight fuel management. Appendix 1 to ANTR OPS 3.375 need not be applied (see (d)(14) below).

(12) ANTR OPS 3.385 Use of supplemental oxygen. With prior approval of the BCAA, excursions between 10000ft and 16 000ft for a short duration may be undertaken without the use of supplemental oxygen in accordance with procedures contained in the Operations Manual. (In such circumstances, the operator must ensure that the passengers are informed before departure that supplemental oxygen will not be provided.)

(13) Appendix 1 to ANTR OPS 3.270 Stowage of baggage and cargo. As appropriate to the type of operation and helicopter.

(14) Appendix 1 to ANTR OPS 3.375 In-flight fuel management. Not applicable.

(15) ANTR OPS 3.630 General Introduction. Instruments and Equipment. Alternative equipment that does not meet current TSO standards but does meet the safety standard of the original equipment may be acceptable to the BCAA.

(16) ANTR OPS 3.775 Supplemental Oxygen - Non pressurised helicopters. With prior approval of the BCAA, excursions of a short duration between 10000ft and 16000ftmay be undertaken without supplemental oxygen, in accordance with procedures contained in the Operations Manual.

(17) Appendix 1 to ANTR OPS 3.775 Supplemental oxygen for non-pressurised helicopters. Not applicable in accordance with (12) & (16) above.

(18) ANTR OPS 3.955(b) Upgrading to Commander. The BCAA may accept an abbreviated command course relevant to the type of operation to be undertaken.

(19) ANTR OPS 3.970(a) Recent Experience. As an alternative to the requirement of ANTR OPS 3.970(a), with prior approval of the BCAA, the 90 day recency may be satisfied if a pilot has performed 3 take-offs, 3 circuits and 3 landings on any helicopter in the same designated group in the preceding 90 days (see AC to Appendix 1 to ANTR OPS 3.005(f) paragraph (d)(19)). The recency qualification for the helicopter type to be operated is conditional upon:

(i) the Type Rating Proficiency Check (TRPC) on the type being valid; and

(ii) the achievement of 2 flying hours on the type or variant within the last 6 months; and

(iii) an OPC being valid on one of the helicopters in the designated group; and

(iv) a strict rotation of OPCs for all helicopters being flown in the designated group; and

(v) the composition of designated groups and the procedure for validation of TRPCs, OPCs and recency, being contained in the operations manual.

(20) Appendix 1 to ANTR OPS 3.965 Recurrent Training and checking. A syllabus applicable to the type of operation may be accepted by the BCAA.

(21) ANTR OPS 3.1060 Operational flight plan. See (2)(i)(A) & (2)(ii)(A) above.

(22) ANTR OPS 3.1235 Security requirements. Applicable only when operating in States where the national security program applies to the operations covered in this Appendix.

(23) ANTR OPS 3.1240 Training programs. Training programs shall be adapted to the kind of operations performed. A suitable self-study training program may be acceptable to the BCAA.

(24) ANTR OPS 3.1250 Helicopter search procedure checklist. No checklist is required.

Appendix 1 to ANTR OPS 3.005(g)

Local area operations (VFR day only)

(a) *Approval*. The operator wishing to conduct operations in accordance with this Appendix must have the prior approval of the authority issuing the AOC. Such an approval willspecify:

(1) The type of helicopter

(2) Type of operation

(3) The geographical limitations of operations in the context of this appendix.

(b) *Prohibition*. The following activities are prohibited:

(1) ANTR OPS 3.065. Carriage of weapons of war and munitions of war.

(2) ANTR OPS 3.265. Carriage of inadmissible passengers, deportees or persons in custody.

(3) ANTR OPS 3.305. Refuelling/de-fuelling with passengers embarking, on board or disembarking.

(4) ANTR OPS 3.335. Smoking on board.

(c) *Alleviation*. The following rules are alleviated:

(1) ANTR OPS 3.135 Additional information and forms to be carried.

(i) ANTR OPS 3.135(a)(1) - Operational Flight Plan. The flight plan may be in a simplified form, relevant to the kind of operations conducted and acceptable to the BCAA.

(ii) ANTR OPS 3.135(a)(4) - Notam/AIS documentation. Are not required.

(iii) ANTR OPS 3.135(a)(5) - Meteorological information. Is not required.

(iv) ANTR OPS 3.135(a)(7) - Notification of special passengers, etc. Is not required.

(v) ANTR OPS 3.135(a)(8) - Notification of special loads, etc. Is not required.

(2) ANTR OPS 3.140 Information retained on the ground. Information need not be retained on the ground when other methods of recording are employed.

(3) ANTR OPS 3.165 Leasing. Applicable only where a formal leasing agreement exists.

Note: The case where the contract to carry the passengers are transferred to another operator to whom the passengers will pay for the transport, is not considered as leasing.

(4) ANTR OPS 3.215 Use of Air Traffic Services. Not applicable unless mandated by air space requirements and providing search and rescue service arrangements are acceptable to the BCAA.

(5) ANTR OPS 3.220 Authorisation of Heliports or Landing Locations by the operator. The operator shall establish a procedure to qualify the Commanders for the selectionof heliports or landing locations, suitable for the type of helicopter and the type of operation.

(6) ANTR OPS 3.255 Fuel policy. Subparagraphs (b) to (d) are not applicable when the fuel policy prescribed in ANTR OPS 3.255(a) ensures that, on completion of the flight, or series of flights, the fuel remaining is not less than an amount of fuel sufficient for 30 minutes flying time at normal cruising (this may be reduced to 20 minutes when operating within an area providing continuous and suitable precautionary landing sites). Final reserve fuel must be established in the operations manual in order to be able to comply with ANTR OPS 3.375(c).

(7) ANTR OPS 3.290(a). See (C)(1)(i) above.

(8) ANTR OPS 3.375 In-flight fuel management. Appendix 1 to ANTR OPS 3.375 need not be applied (see (c)(10) below).

(9) ANTR OPS 3.385 Use of supplemental oxygen. With prior approval of the BCAA excursions between 10 000ft and 13 000ft for a short duration may be undertaken without the use of supplemental oxygen in accordance with procedures contained in the Operations Manual. (In such circumstances, the operator must ensure that passengers are informed before departure that supplemental oxygen will not be provided.)

(10) Appendix 1 to ANTR OPS 3.375 In-flight fuel management. Not applicable.

(11) ANTR OPS 3.630 General Introduction. Instruments and Equipment. Alternative equipment that does not meet current TSO standards but does meet the safety standard of the original equipment may be acceptable to the BCAA.

(12) ANTR OPS 3.775 Supplemental Oxygen - Non pressurised helicopters. With prior approval of the BCAA, excursions of a short duration between 10 000ft and 16 000ft may be undertaken without supplemental oxygen, in accordance with procedures contained in the Operations Manual.

(13) Appendix 1 to ANTR OPS 3.775 Supplemental oxygen for non-pressurised helicopters. Not applicable in accordance with (9) & (12) above.

(14) ANTR OPS 3.1060 Operational flight plan. See (C)(1)(i) above.

(15) ANTR OPS 3.1235 Security requirements. Applicable only in States where the national security program applies to the operations covered in this Appendix.

Appendix 1 to ANTR OPS 3.005(h)

Helicopter Hoist Operations (HHO)

Note: *The BCAA is empowered to decide which operation is a HHO operation in the sense of this Appendix.*

(a) *Terminology*

(1) Helicopter Hoist Operations (HHO) Flight. A flight by a helicopter operating under an HHO approval, the purpose of which is to facilitate the transfer of persons and/or cargo by means of a helicopter hoist.

(2) HHO Crew Member. A crew member who performs assigned duties relating to the operation of a hoist.

(3) HHO Offshore. A flight by a helicopter operating under a HHO approval, the purpose of which is to facilitate the transfer of persons and/or cargo by means of a helicopter hoist from or to a vessel or structure in a sea area.

(4) Hoist Cycle. For the purpose of the setting of crew qualifications of this appendix; is one down-and-up cycle of the hoist hook.

(5) HHO Site. A specified area at which a helicopter performs a hoist transfer.

(6) HHO Passenger. A person who is to be transferred by means of a helicopter hoist.

(b) *Operations Manual*. The operator must ensure that the Operations Manual includes a supplement containing material specific to HHO. In particular it will address:

(1) Performance criteria.

(2) If required, the conditions under which offshore HHO transfer may be conducted including the relevant limitations on vessel movement and wind speed.

(3) The weather limitations for HHO.

(4) The criteria for determining the minimum size of the HHO site - appropriate to the task.

(5) The procedures for determining minimum crew.

(6) The method by which crew members record hoist cycles.

When required, relevant extracts from the Operations Manual supplement shall be made available to the organisation for which the HHO is being provided.

(c) *Maintenance of HHO equipment*. Maintenance instructions for HHO systems must be established by the operator, in liaison with the manufacturer, included in the operator's helicopter maintenance programme prescribed in ANTR OPS 3.910,and be approved by the BCAA.

(d) *Operating requirements*

(1) *The Helicopter*. During HHO, the helicopter must be capable of sustaining a critical power unit failure with the remaining engine(s) at the appropriate power setting, without hazard to the suspended person(s)/cargo, third parties, or property. (Except for HEMS HHO at a HEMS operating site where the requirement need not be applied.)

(2) *The Crew*. Notwithstanding the requirements prescribed in Subpart N, the following apply to HHO operations:

(i) *Selection*. The Operations Manual shall contain criteria for the selection of flight crew members for the HHO task, taking previous experience into account.

(ii) *Experienc*e. The minimum experience level for commanders conducting HHO flights shall not be less than:

(A) *Offshore*:

(A1) 1 000 hours pilot-in-command of helicopters or 1 000 hours as co- pilot in HHO operations of which 200 hours is as pilot-in-command under supervision; and

(A2) 50 hoist cycles conducted offshore, of which 20 cycles shall be at night if night operations are being conducted.

(B) *Onshore*:

(B1) 500 hours pilot-in-command of helicopters or 500 hours as co-pilot in HHO operations of which 100 hours is as pilot-in-command under supervision;

(B2) 200 hours operating experience in helicopters gained in an operational environment similar to the intended operation (see IEM to Appendix 1 to ANTR-OPS 3.005(d), paragraph (c)(3)(ii)(B));and

(B3) 50 hoist cycles, of which 20 cycles shall be at night if night operations are being conducted.

(C) Successful completion of training in accordance with the procedures contained in the Operations Manual and relevant experience in the role and environment under which HHO conducted.

(iii) *Recency*. All pilots and HHO crew members conducting HHO shall, in addition to the requirements of ANTR OPS 3.970(a), have completed in the last 90 days:

(A) When operating by day: Any combination of 3 day or night hoist cycles, each of which shall include a transition to and from the hover.

(B) When operating by night: 3 night hoist cycles, each of which shall include a transition to and from the hover.

(iv) *Crew Composition*. The minimum crew for day or night operations shall be as stated in the Operations Manual supplement and will be dependent on the type of helicopter, the weather conditions, the type of task, and, in addition for offshore operations, the HHO site environment, the sea state and the movement of the vessel but, in no case will be less than one pilot and one HHO crew member (See AC to Appendix 1 to ANTR-OPS 3.005(h) paragraph (d)(2)(iv).)

(e) *Additional Requirements*

(1) *HHO Equipment*. The installation of all helicopter hoist equipment including any subsequent modifications and where appropriate, its operation, shall have an airworthiness approval appropriate to the intended function. Ancillary equipment must be designed and tested to the appropriate standard and acceptable to the BCAA.

(2) *Helicopter Communication Equipment.* Radio equipment, in addition to that required by Subpart L, will require airworthiness approval. The following shall require two-way communication with the organisation for which the HHO is being provided and, where possible, communication with ground personnel:

(i) Day and night offshore operations; or

(ii) Night onshore operations,

(f) *Training and Checking*.

(1) *Flight Crew Members*. The Flight crew member shall be trained in the followingsubjects:

(i) Subpart N training with the following additional items:

(A) Fitting and use of the hoist;

(B) Preparing the helicopter and hoist equipment for HHO;

(C) Normal and emergency hoist procedures by day and, when required, by night;

(D) Crew co-ordination concept specific to HHO;

(E) Practice of HHO procedures; and

(F) The dangers of static electricity discharge.

(ii) Subpart N checking with the following additional items:

(A) Proficiency checks, as appropriate to day operations which must also be conducted by night if such operations are undertaken by the operator. The checks should include procedures likely to be used at HHO sites with special emphasis on:

(A1) Local area meteorology;

(A2) HHO flight planning;

(A3) HHO departures;

(A4) A transition to and from the hover at the HHO site;

(A5) Normal and simulated emergency HHO procedures; and

(A6) Crew co-ordination.

(2) *HHO Crew Member*. The HHO crew member shall be trained in accordance with the requirements of Subpart O with the following additional items:

(i) Duties in the HHO role;

(ii) Fitting and use of the hoist;

(iii) Operation of hoist equipment;

(iv) Preparing the helicopter and specialist equipment for HHO;

(v) Normal and emergency procedures;

(vi) Crew co-ordination concepts specific to HHO;

(vii) Operation of inter-communications and radio equipment;

(viii) Knowledge of emergency hoist equipment;

(ix) Techniques for handling HHO passengers;

(x) Effect of the movement of personnel on the centre of gravity and mass during HHO;

(xi) Effect of the movement of personnel on performance during normal and emergency flight conditions;

(xii) Techniques for guiding pilots over HHO sites;

(xiii) Awareness of specific dangers relating to the operating environment; and

(xiv) The dangers of static electricity discharge.

(3) *HHO Passengers*. Prior to any HHO flight, or series of flights, HHO passengers shallbe briefed and made aware of the dangers of static electricity discharge and other HHO considerations.

Appendix 1 to ANTR OPS 3.005(i)

Helicopter operations at a public interest site

(a) *Approval* - The operator wishing to conduct operations in accordance with this Appendix must have the prior approval of the authority issuing the AOC and the BCAA of the Statein which it is intended to conduct such operations. Such an approval shall specify:

(1) The public interest site(s) see AC to Appendix 1 to 3.005(i) paragraph (a)(1);

(2) The type(s) of helicopter; and

(3) The type of operation.

(b) *Terminology*

(1) Public interest site: A site, used exclusively for operations in the public interest.

(c) *Applicability*: This Appendix shall only be applicable to multi-engine turbine powered helicopter types, with a maximum approved passenger seating configuration (MAPSC) of six or less, operating to/from public interest sites.

(1) located in a hostile environment; and

(2) which were established as heliports or landing locations before the 1 of July 2002.

(d) *Alleviation*:

(1) operations to/from a public interest site may be conducted in accordance with Subpart H (Performance Class 2) and are exempt from the following requirements:

(i) the requirement of ANTR OPS 3.520(a)(2); and

(ii) the requirement of ANTR OPS 3.535(a)(2);

until 31 December 2004, provided that the operator has been granted a relevant approval by the authority (See Appendix 1 to ANTR OPS 3.517(a) subparagraphs (a)(2)(i) and (ii).

(2) From 1 January, 2005, where the size of the public interest site or its obstacle environment does not allow the helicopter to be operated in accordance with Subpart G (Performance Class 1), the exemption specified in sub-paragraph (d)(1) above maybe approved by the authority beyond 31 December 2004 provided;

(i) for operations in a non-congested hostile environment, the helicopter mass does not exceed the maximum mass specified in the Helicopter Flight Manual for an AEO OGE hover in still air with all power units operating at an appropriate power rating; and

(ii) for operations in a congested hostile environment, the helicopter mass does not exceed the maximum mass specified in the Helicopter Flight Manual for a climb gradient of 8% in still air; at the appropriate take-off safety speed (Vtoss) with the critical power unit inoperative and the remaining power units operating at an appropriate power rating (See AC to Appendix 1 to ANTR OPS 3.005(i) sub-paragraph (d)(2)).

(e) *Operation*. Site specific procedures must be established in the Operations Manual to minimise the period during which there would be danger to helicopter occupants and persons on the surface in the event of a power unit failure during take-off and landing at a public interest site. Part C of the Operations Manual shall contain for each public interest site; a diagram or annotated photograph showing the main aspects, the dimensions, the non- conformance with Subpart G (Performance Class 1), the main risks and the contingency plan should an incident occur.

Appendix 1 to ANTR OPS 3.125

Documents to be carried

See ANTR OPS 3.125

(a) In case of loss or theft of documents specified in ANTR OPS 3.125, the operation is allowed to continue until the flight reaches the base or a place where a replacement document can be provided.

(b) The Article 83 bis agreement summary should contain the information in the template below, in a standardized format suggested below.

<table>
<tr><th colspan="5">ARTICLE 83 bis AGREEMENT SUMMARY</th></tr>
<tr><td>Title of the Agreement:</td><td colspan="4"></td></tr>
<tr><td>State of Registry:</td><td colspan="2"></td><td colspan="2">Focal point:</td></tr>
<tr><td>State of the principal location of a general aviation operator:</td><td colspan="2"></td><td colspan="2">Focal point:</td></tr>
<tr><td rowspan="2">Date of signature:</td><td colspan="4">By State of Registry[1]:</td></tr>
<tr><td colspan="4">By State of the principal location of a general aviation operator[1]:</td></tr>
<tr><td>Duration:</td><td colspan="2">Start Date[1]:</td><td colspan="2">End Date (if applicable)[2]:</td></tr>
<tr><td>Languages of the Agreement</td><td colspan="4"></td></tr>
<tr><td>ICAO Registration No.:</td><td colspan="4"></td></tr>
<tr><td>Umbrella Agreement (if any) with ICAO Registration number:</td><td colspan="4"></td></tr>
<tr><th>Convention on International Civil Aviation</th><th colspan="4">ICAO Annexes affected by the transfer of responsibility in respect of certain functions and duties to the State of the operator / State of the principal location of a general aviation operator</th></tr>
<tr><td rowspan="2">Article 12: Rules of the air</td><td rowspan="2">Annex 2, all chapters</td><td>Yes</td><td>☐</td><td rowspan="2"></td></tr>
<tr><td>No</td><td>☐</td></tr>
<tr><td rowspan="2">Article 30 a): Aircraft radio equipment</td><td rowspan="2">Annex 2 (radio station licence)</td><td>Yes</td><td>☐</td><td rowspan="2"></td></tr>
<tr><td>No</td><td>☐</td></tr>
<tr><td rowspan="2">Articles 30 b) and 32 a): Licenses of personnel</td><td rowspan="2">Annex 1, Chapters 1, 2, 3 and 6; andAnnex 6 Part I (radio operator); or Annex 6, Part III, Section II, (composition ofthe flight crew (radio operator); and/or Annex 6, Part II (qualifications and/or flight crew member licensing); or Annex 6, Part III, Section III (qualifications)</td><td>Yes</td><td>☐</td><td rowspan="2">Annex 6: [Specify Part and paragraph][3]</td></tr>
<tr><td>No</td><td>☐</td></tr>
<tr><td rowspan="6">Article 31: Certificates ofAirworthiness</td><td rowspan="2">Annex 6 Part I or Part III, Section II</td><td>Yes</td><td>☐</td><td rowspan="2">[Specify Part and chapters][3]</td></tr>
<tr><td>No</td><td>☐</td></tr>
<tr><td rowspan="2">Annex 6 Part II or Part III, Section III</td><td>Yes</td><td>☐</td><td rowspan="2">[Specify Part and chapters][3]</td></tr>
<tr><td>No</td><td>☐</td></tr>
<tr><td rowspan="2">Annex 8 Part II, Chapters 3 and 4</td><td>Yes</td><td>☐</td><td rowspan="2">[Specify chapters][3]</td></tr>
<tr><td>No</td><td>☐</td></tr>
</table>

Aircraft affected by the transfer of responsibilities to the State of the operator / State of the principal location of a general aviation operator					
Aircraft make, model, series	Nationality and registration marks	Serial No.	AOC No. (Commercial air transport)	Dates of transfer of responsibilities	
				From[1]	To (if applicable)[2]

Notes:

1. *dd/mm/yyyy.*
2. *dd/mm/yyyy or N/A if not applicable.*
3. *Square brackets indicate information that needs to be provided.*

Appendix 1 to ANTR OPS 3.135

Additional information and forms to be carried

(See ANTR OPS 3.135)

The BCAA may authorize an alleviation against the non-carriage of specific documents for flights within the Bahraini FIR.

SUBPART C – OPERATOR CERTIFICATION AND SUPERVISION

ANTR OPS 3.175 General rules for Air Operator Certification/Authorisation

Note 1: Appendix 1 to this paragraph specifies the contents and conditions of the AOC/Authorisation.

Note 2: Appendix 2 to this paragraph specifies the management and organisation requirements.

Note 3: Unless otherwise specified by the BCAA, all private helicopters shall meet these requirements for the issuance of an Authorisation to operate.

(a) The operator shall not operate a helicopter for the purpose of commercial/private air transportation otherwise than under, and in accordance with, the terms and conditions of an Air Operator Certificate (AOC)/Authorisation issued by the BCAA.

(b) The air operator certificate shall authorise the operator to conduct commercial air transport operations in accordance with the operations specifications.

Note: Unless otherwise specified, reference to an Air Operator Certificate includes the operations specifications associated with the air operator certificate.

(c) For private helicopter operations, an Authorisation shall authorise the operator to conduct private operations in accordance with the operations specifications.

(d) An applicant for an AOC/Authorisation, or variation of an AOC/Authorisation, shall allow the BCAA to examine all safety aspects of the proposed operation.

(e) An applicant for an AOC/Authorisation must:

(1) Not hold an AOC/Authorisation issued by another Authority unless specifically approved by the Authorities concerned;

(2) Have his principal place of business and, if any, his registered office located in the Kingdom of Bahrain (see IEM OPS 3.175(c)(2));

(3) Have registered the helicopters which are to be operated under the AOC/Authorisation in the Kingdom of Bahrain; and

(4) Satisfy the BCAA that he is able to conduct safe operations.

(f) Notwithstanding sub-paragraph (c)(3) above, the operator may operate, with the mutual agreement of the authority issuing the AOC/Authorisation and another Authority, helicopters registered on the national register of the second-named Authority.

(g) The operator shall grant the BCAA access to his organisation and helicopters and shall ensure that, with respect to maintenance, access is granted to any associated maintenance organisation, to determine continued compliance with OPS.

(h) An AOC/Authorisation will be varied, suspended or revoked if the BCAA is no longer satisfied that the operator can maintain safe operations.

(i) The operator must satisfy the BCAA that:

(1) Its organisation and management are suitable and properly matched to the scale and scope of the operation; and

(2) Procedures for the supervision of operations have been defined

(j) The operator must have nominated an accountable manager acceptable to the BCAA who has corporate authority for ensuring that all operations and maintenance activities can be financed and carried out to the standard required by the BCAA.

(k) The operator must have nominated post holders, acceptable to the BCAA, who are responsible for,

(1) Flight operations;

(2) The maintenance system;

(3) Crew training;

(4) Ground operations;

(5) Aviation Security.

(6) Quality Manager

(See AC OPS 3.175(k))

(l) A person may hold more than one of the nominated posts if acceptable to the BCAA but, for operators who employ 21 or more full time staff, a minimum of two persons are required to cover the four areas of responsibility. (See AC OPS 3.175(l) &(m))

(m) For operators who employ 20 or less full time staff, one or more of the nominated posts may be filled by the accountable manager if acceptable to the BCAA. (See AC OPS 3.175(l) & (m).)

(n) The operator must ensure that every flight is conducted in accordance with the provisions of the Operations Manual.

(o) The operator must arrange appropriate ground handling facilities to ensure the safe handling of its flights. The operator shall ensure that any inadequacy of facilities observed in the course of operations is reported to the authority responsible for them without undue delay.

(p) The operator must ensure that its helicopters are equipped and its crews are qualified, as required for the area and type of operation.

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

(r) The operator must comply with the maintenance requirements, in accordance with Subpart M, for all helicopters operated under the terms of its AOC.

(s) The operator must provide the BCAA with a copy of the Operations Manual, as specified in Subpart P and all amendments or revisions to it.

(t) The operator must maintain operational support facilities at the main operating base, appropriate for the area and type of operation.

(u) The operator shall not establish an operating base in another State, without prior approval from the BCAA and notification to the BCAA of the State in which the operating base is located.

ANTR OPS 3.180 Issue, variation and continued validity of an AOC/Authorisation

(a) The operator will not be granted an AOC/Authorisation, or a variation to an AOC/Authorisation, and that AOC/Authorisation will not remain valid unless:

(1) Helicopters operated have a valid Certificate of Airworthiness;

(2) The maintenance system has been approved by the BCAA in accordance with Subpart M; and

(3) He has satisfied the BCAA that he has the ability to:

(i) Establish and maintain an adequate organisation;

(ii) Establish and maintain a quality system in accordance with ANTR OPS 3.035;

(iii) Comply with required training programmes;

(iv) Comply with maintenance requirements, consistent with the nature and extent of the operations specified, including the relevant items prescribed in ANTR OPS 3.175(g) to (o); and

(v) Comply with ANTR OPS 3.175.

(b) Notwithstanding the provisions of ANTR OPS 3.185(f), the operator must notify the BCAA as soon as practicable of any changes to the information submitted in accordance with sub-paragraph (a) above.

(c) If the BCAA is not satisfied that the requirements of sub-paragraph (a) above have been met, the BCAA may require the conduct of one or more demonstration flights, operated as if they were commercial air transport flights.

(d) The BCAA has established a system for both the certification and the continued surveillance of the operator to ensure that the required standards of operations established in this Subpart are maintained.

ANTR OPS 3.185 Administrative requirements

(a) The operator shall ensure that the following information is included in the initial application for an AOC/Authorisation and, when applicable, any variation or renewal applied for:

(1) The official name and business name, address and mailing address of the applicant;

(2) A description of the proposed operation;

(3) A description of the management organisation;

(4) The name of the accountable manager;

(5) The names of major post holders, including those responsible for flight operations, the maintenance system, crew training and ground operations together with their qualifications and experience; and

(6) The Operations Manual.

(b) In respect of the operator’s maintenance system only, the following information must be included in the initial application for an AOC/Authorisation and, when applicable, any variation or renewal applied for, and for each helicopter type to be operated (see IEM OPS 3.185(b)):

(1) The maintenance management exposition;

(2) The operator’s helicopter maintenance programme(s);

(3) The helicopter technical log;

(4) Where appropriate, the technical specification(s) of the maintenance contract(s) between the operator and any approved maintenance organisation;

(5) The number of helicopters;

(c) The application for an initial issue of an AOC/Authorisation must be submitted at least 90 days before the date of intended operation except that the Operations Manual may be submitted later but not less than 60 days before the date of intended operation.

(d) The application for the variation of an AOC/Authorisation must be submitted at least 30 days, or as otherwise agreed, before the date of intended operation.

(e) The application for the renewal of an AOC/Authorisation must be submitted at least 30 days, or as otherwise agreed, before the end of the existing period of validity.

(f) Other than in exceptional circumstances, the BCAA must be given at least 10 days prior notice of a proposed change of a nominated post holder.

ANTR OPS 3.190 *Intentionally blank*

Appendix 1 to ANTR OPS 3.175

Contents and conditions of the Air Operator Certificate

1. The air operator certificate shall follow the layout of ICAO Annex 6, Part III, Appendix 3, paragraph 2 and shall contain at least the following information;

   (a) The State of the Operator and the issuing authority (the BCAA);

   (b) The air operator certificate number and its expiration date;

   (c) The operator name, trading name (if different) address of the (principal place of business;

   (d) Date of issue and name, signature and title of the BCAA representative; and

   (e) the location, in a controlled document carried on board, where the contact details of operational management can be found.

2. The operations specifications associated with the air operator certificate shall follow the layout of ICAO Annex 6, Part III, Appendix 3, paragraph 3 and shall contain at least the information for each aircraft model in the operator‘s fleet, identified by aircraft make, model and series, the following list of authorisations, conditions and limitations shall be included:

   (a) issuing authority contact details, operator name and AOC number, date of issue and signature of the BCAA representative, aircraft model, types and area of operations.

   (b) Special limitations; and

   (c) Special authorisations/Specific Approvals/Remarks e.g.:

      (1) Dangerous Goods

      (2) CAT II/CAT III (including approved minima)

      (3) Offshore operations

      (4) HEMS

      (5) Navigation specifications for PBN operations

      (6) Other; such as

         (i) Helicopter operations over a hostile environment located outside a congested area (See Appendix 1 to ANTR-OPS 3.005(e)).

         (ii) Operations for small helicopters (VFR Day only) (See Appendix 1 to ANTR OPS 3.005(f)).

         (iii) Local Area Operations (VFR Day only) (See Appendix 1 to ANTR OPS 3.005(g))

         (iv) Helicopter Hoist Operations (See Appendix 1 to ANTR OPS 3.005(h)

         (v) Operations to Public Interest Sites (See Appendix 1 to ANTR OPS 3.005(i));

         (vi) Helicopter operations with an exposure time to a power unit failure during take-off or landing. (See ANTR OPS 3.517 and ANTR OPS 3.540(a)(4).)

Note1: Private Authorisations may follow the same format.

Note 2: Provide all relevant information given under the "Notes" to the format of operations specification given in Appendix 3 to Annex 6, Part III.

Appendix 2 to ANTR OPS 3.175

The Management and Organisation of an AOC/Authorisation Holder

The issue of an air operator certificate by the BCAA shall be dependent upon the operator demonstrating an adequate organization, method of control and supervision of flight operations, training programme as well as ground handling and maintenance arrangements consistent with the nature and extent of the operations specified.

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

The continued validity of an air operator certificate/Authorisation shall depend upon the operator maintaining these requirements under the supervision of the BCAA.

If particular;

(a) *General* The operator must have a sound and effective management structure in order to ensure the safe conduct of air operations. Nominated post holders must have managerial competency together with appropriate technical/operational qualifications (see also AC OPS 3.175 (i)) in aviation.

(b) *Nominated post holders*

(1) A description of the functions and the responsibilities of the nominated post holders, including their names, must be contained in the Operations Manual and the BCAA must be given notice in writing of any intended or actual change in appointments or functions.

(2) The operator must make arrangements to ensure continuity of supervision in the absence of nominated post holders.

(3) A person nominated as a post holder by the holder of an AOC/Authorisation must not be nominated as a post holder by the holder of any other AOC/Authorisation, unless acceptable to the Authorities concerned.

(4) Persons nominated as post holders must be contracted to work sufficient hours to fulfil the management functions associated with the scale and scope of the operation.

(c) *Adequacy and supervision of staff*

(1) *Crew members*. The operator must employ sufficient flight and cabin crew for the planned operation, trained and checked in accordance with Subpart N and Subpart Oas appropriate.

(2) *Ground Staff*

(i) The number of ground staff is dependent upon the nature and the scale of operations. Operations and ground handling departments, in particular, must be staffed by trained personnel who have a thorough understanding of their responsibilities within the organisation.

(ii) The operator contracting other organisations to provide certain services, retains responsibility for the maintenance of proper standards. In such circumstances, a nominated post holder must be given the task of ensuring that any contractor employed meets the required standards.

(3) *Supervision*

(i) The number of supervisors to be appointed is dependent upon the structure of the operator and the number of staff employed.

(ii) The duties and responsibilities of these supervisors must be defined, and any other commitments arranged so that they can discharge their supervisory responsibilities.

(iii) The supervision of crew members and ground staff must be exercised by individuals possessing experience and personal qualities sufficient to ensure the attainment of the standards specified in the operations manual.

(d) *Accommodation facilities*

(1) The operator must ensure that working space available at each operating base is sufficient for personnel pertaining to the safety of flight operations. Consideration must be given to the needs of ground staff, those concerned with operational control,the storage and display of essential records, and flight planning by crews.

(2) Office services must be capable, without delay, of distributing operational instructions and other information to all concerned.

(e) *Documentation*. The operator must make arrangements for the production of manuals, amendments and other documentation.

SUBPART D – OPERATIONAL PROCEDURES

ANTR OPS 3.195 Operational Control

(See AC OPS 3.195)

(a) The operator shall:

(1) Establish and maintain a method of exercising operational control approved by the BCAA; and

(2) Exercise operational control over any flight operated under the terms of his AOC/Authorisation.

(b) Responsibility for operational control shall be delegated only to the pilot-in-command and to a flight dispatcher if the operator's approved method of control and supervision of flight operations requires the use of flight dispatcher personnel.

(c) If an emergency situation which endangers the safety of the helicopter or persons becomes known first to the flight dispatcher, action by that person shall include, where necessary, notification to the appropriate authorities of the nature of the situation without delay, and requests for assistance if required. In the event of an emergency, a flight dispatcher shall:

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

(2) convey safety-related information to the pilot-in-command that may be necessary for the safe conduct of the flight, including information related to any amendments to the flight plan that become necessary in the course of the flight.

Note: It is equally important that the pilot-in-command also convey similar information to the flight dispatcher during the course of the flight, particularly in the context of emergency situations.

(d) If an emergency situation which endangers the safety of the helicopter or persons necessitates the taking of action which involves a violation of local regulations or procedures, the pilot-in-command shall notify the appropriate local authority without delay. If required by the State in which the incident occurs, the pilot-in-command shall submit a report on any such violation to the appropriate authority of such State; in that event, the pilot-in-command shall also submit a copy of it to the BCAA. Such reports shall be submitted as soon as possible and normally within ten days.

ANTR OPS 3.200 Operations Manual

The operator shall provide an Operations Manual in accordance with ANTR OPS 3, Subpart P for the use and guidance of operations personnel.

ANTR OPS 3.205 Competence of operations personnel

The operator shall ensure that all personnel assigned to, or directly involved in, ground and flight operations are properly instructed, have demonstrated their abilities in their particular duties and areaware of their responsibilities and the relationship of such duties to the operation as a whole.

ANTR OPS 3.207 Flight Dispatcher

(a) When the BCAA requires that a flight dispatcher, employed in conjunction with an approved method of control and supervision of flight operations, be licensed, that flight dispatcher shall be licensed in accordance with the provisions of ANTR Part II, Chapter 4.

(b) In accepting proof of qualifications other than the option of holding of a flight dispatcher licence, the BCAA, in accordance with the approved method of control and supervision of flight operations, shall require that, as a minimum, such persons meet the requirements specified in ANTR Part II, Chapter 4 for the flight dispatcher licence.

(c) A flight dispatcher in conjunction with a method of control and supervision of flight operations shall:

(1) assist the pilot-in-command in flight preparation and provide the relevant information;

(2) assist the pilot-in-command in preparing the operational and ATS flight plans, sign when applicable and file the ATS flight plan with the appropriate ATS unit; and

(3) furnish the pilot-in-command while in flight, by appropriate means, with information which may be necessary for the safe conduct of the flight.

(d) A flight dispatcher shall not be assigned to duty unless that person has:

(1) satisfactorily completed the operator-specific training course that addresses all the specific components of its approved method of control and supervision of flight operations;

(2) made, within the preceding 12 months, at least a one way qualification flight in the flight crew compartment of helicopter over any area for which that individual is authorised to exercise flight supervision. The flight should include landings at as many aerodromes as practicable;

Note: For the purpose of the qualification flight, the flight dispatcher must be able to monitor the flight crew intercommunication system and radio communications, and be able to observe the actions of the flight crew.

(3) demonstrated to the operator a knowledge of:

(i) the contents of the operations manual;

(ii) the radio equipment in the helicopters used; and

(iii) the navigation equipment in the helicopters used;

(4) demonstrated to the operator a knowledge of the following details concerning operations for which the officer is responsible and areas in which that individual is authorised to exercise flight supervision:

(i) the seasonal meteorological conditions and the sources of meteorological information;

(ii) the effects of meteorological conditions on radio reception in the helicopters used;

(iii) the peculiarities and limitations of each navigation system which is used by the operation; and

(iv) the helicopter loading instructions;

(5) demonstrated to the operator knowledge and skills related to human performance relevant to dispatch duties; and

(6) demonstrated to the operator the ability to perform the duties specified in ANTR OPS 3.195.

(7) maintained complete familiarization with all features of the operation which are pertinent to such duties, including knowledge and skills related to human performance.

(e) A flight dispatcher should not be assigned to duty after 12 consecutive months of absence from such duty, unless the provisions of paragraph (d) above are met.

ANTR OPS 3.210 Establishment of Procedures

(a) The operator shall establish procedures and instructions, for each helicopter type, containing ground staff and crew members' duties for all types of operation on the ground and in flight. (See AMC OPS 3.210(a).)

(b) The operator shall establish a check-list system to be used by crew members for all phases of operation of the helicopter under normal, abnormal and emergency conditions as applicable, to ensure that the operating procedures in the Operations Manual are followed. (See IEM OPS 3.210(b)). The design and utilisation of checklists shall observe Human Factors and CRM principles.

(c) The operator shall not require a crew member to perform any activities during critical phases of the flight other than those required for the safe operation of the helicopter.

(d) The operator shall not permit a helicopter rotor to be turned under power for the purpose of flight without a qualified pilot at the controls. The operator shall provide appropriately specific training and procedures to be followed for all personnel, other than qualified pilots, who are likely to carry out the turning of a rotor under power for purposes other than flight. (See AC OPS 3.210(d)).

(e) The operator shall issue operating instructions and provide information on helicopter climb performance with all engines operating to enable the pilot-in-command to determine the climb gradient that can be achieved during the departure phase for the existing take-off conditions and intended take-off technique. This information should be included in the operations manual.

ANTR OPS 3.215 Use of Air Traffic Services

The operator shall ensure that Air Traffic Services are used for all flights whenever available.

ANTR OPS 3.220 Authorisation of Heliports or Landing Locations by the Operator
(See AMC No 1 OPS 3.220)

The operator shall only authorise use of heliports or landing locations that are adequate for the type(s) of helicopter and operation(s) concerned.

ANTR OPS 3.225 Heliport Operating Minima

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

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

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

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

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

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

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

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

Note 3: Regulations on approach classification as it relates to instrument approach operations, procedures, runways and navigation systems is contained in ANTR OPS 3.430 for each departure, destination or alternate aerodrome authorised to be used in accordance with ANTR OPS 3.220.

ANTR OPS 3.230 Departure and Approach Procedures

(a) The operator shall use departure and approach procedures if specified by the State in which the heliport or landing locations is located.

(b) Notwithstanding sub-paragraph (a) above, a commander may accept an ATC clearance to deviate from a published departure or arrival route, provided obstacle clearance criteria are observed and full account is taken of the operating conditions. The final approach must be flown visually or in accordance with the established instrument approach procedure.

(c) Different procedures to those required to be used in accordance with sub-paragraph (a)above may only be implemented by the operator provided they have been approved by the State of the heliport or landing location, if required, and accepted by the BCAA and are specified in the operations manual.

Note 1.— Operational procedures recommended for the guidance of operations personnel involved in instrument flight operations are described in PANS-OPS (ICAO Doc 8168), Volume I.

Note 2.— Criteria for the construction of instrument flight procedures for the guidance of procedure specialists are provided in PANS-OPS (ICAO Doc 8168), Volume II. Obstacle clearance criteria and procedures used in certain States may differ from PANS-OPS, and knowledge of these differences is important for safety reasons.

ANTR OPS 3.235 Noise abatement procedures

The operator shall ensure that take-off and landing procedures take into account the need to minimise the effect of helicopter noise.

ANTR OPS 3.240 Routes and areas of operation

(a) The operator shall ensure that operations are only conducted along such routes or within such areas, for which:

(1) Ground and/or water facilities and services, including meteorological services, are provided which are adequate for the planned operation;

(2) The performance of the helicopter intended to be used is adequate to comply with minimum flight altitude requirements;

(3) The equipment of the helicopter intended to be used meets the minimum requirements for the planned operation;

(4) Appropriate maps and charts are available (ANTR OPS 3.135(a)(9) refers);

(5) For helicopters operated in Performance Class 3, surfaces are available which permit a safe forced landing to be executed, except when the helicopter has an approval to operate in accordance with Appendix 1 to ANTR-OPS 3.005(e)

(6) For helicopters operated in Performance Class 3 and conducting Coastal Transit operations, Part C of the Operations Manual contains procedures to ensure that the width of the Coastal Corridor, and the equipment carried, is consistent with the conditions prevailing at the time (See IEM OPS 3.240(a)(6)).

(b) The operator shall ensure that operations are conducted in accordance with any restriction on the routes or the areas of operation, imposed by the BCAA.

ANTR OPS 3.243 Operations in areas with specific navigation performance requirements
(See IEM OPS 3.243)

(a) The operator shall not operate a helicopter in defined areas, or a defined portion of specified airspace, based on Regional Air Navigation Agreements where a navigation specification for performance-based navigation has been prescribed unless approved to do so by the BCAA (RNP/RNAV Approval). (See also ANTR OPS 3.865(c)(2).)

(b) GNSS equipment should be in compliance with the RNP Navigation requirements of ICAO Document 9613 – Performance Based Navigation Manual.

ANTR OPS 3.245 *Intentionally blank*

ANTR OPS 3.250 Establishment of minimum flight altitudes
(See IEM OPS 3.250)

(a) The operator shall establish minimum flight altitudes and the methods to determine those altitudes for all route segments to be flown which provide the required terrain clearance taking into account the requirements of OPS Part 3, Subparts F to I.

(b) The method for establishing minimum flight altitudes must be approved by the BCAA.

(c) Where minimum flight altitudes established by States overflown are higher than those established by the operator, the higher values shall apply.

(d) The operator shall take into account the probable effects of the following factors on the safety of the operation in question when establishing minimum flight altitudes:

(1) The accuracy and reliability with which the position of the helicopter can be determined;

(2) The inaccuracies in the indications of the altimeters used;

(3) The characteristics of the terrain (e.g. sudden changes in the elevation) along the routes or in the areas where operations are to be conducted.

(4) The probability of encountering unfavourable meteorological conditions (e.g. severe turbulence and descending air currents); and

(5) Possible inaccuracies in aeronautical charts; and

(6) airspace restrictions.

(e) In fulfilling the requirements prescribed in sub-paragraph (d) above due consideration shall be given to:

(1) Corrections for temperature and pressure variations from standard values;

(2) The ATC requirements; and

(3) Any contingencies along the planned route.

ANTR OPS 3.255 Fuel and Oil Requirements/Policy
(See AMC OPS 3.255)

(a) A flight shall not be commenced unless, taking into account both the meteorological conditions and any delays that are expected in flight, the helicopter carries sufficient fuel and oil to ensure that it can safely complete the flight. In addition, a reserve shall be carried to provide for contingencies. In computing the fuel and oil required, at least the following shall be considered:

(1) meteorological conditions forecast;

(2) expected air traffic control routings and traffic delays;

(3) for IFR flight, one instrument approach at the destination heliport, including a missed approach;

(4) the procedures prescribed in the operations manual for loss of pressurization, where applicable, or failure of one engine while en route; and

(5) any other conditions that may delay the landing of the helicopter or increase fuel and/or oil consumption.

Note: Nothing in ANTR OPS 3.350 precludes amendment of a flight plan in flight in order to replan the flight to another heliport, provided that the requirements of ANTR OPS 3.350 can be complied with from the point where the flight has been replanned.

(b) VFR Operations

The fuel and oil carried in order to comply with (a) shall, in the case of VFR operations, be at least the amount to allow the helicopter to:

(1) fly to the landing site to which the flight is planned;

(2) have final reserve fuel to fly thereafter for a period of 20 minutes at best-range speed; and

(3) have an additional amount of fuel, to provide for the increased consumption on the occurrence of any of the potential contingencies specified by the operator to the satisfaction of the BCAA. (See AMC OPS 3.255)

(c) IFR Operations

The fuel and oil carried in order to comply with (a) shall, in the case of IFR operations, be at least the amount to allow the helicopter:

(1) When an alternate is not required, to fly to and execute an approach at the heliport or landing location to which the flight is planned, and thereafter to have:

(i) final reserve fuel to fly 30 minutes at holding speed at 450 m (1 500 ft) above the destination heliport or landing location under standard temperature conditions and approach and land; and

(ii) an additional amount of fuel, to provide for the increased consumption on the occurrence of any of the potential contingencies specified by the operator to the satisfaction of the BCAA. (See AMC OPS 3.255)

(2) When an alternate is required, to fly to and execute an approach, and a missed approach, at the heliport or landing location to which the flight is planned, and thereafter:

(i) to fly to and execute an approach at the alternate specified in the flight plan; and then

(ii) have final reserve fuel to fly for 30 minutes at holding speed at 450 m (1 500 ft) above the alternate under standard temperature conditions, and approach and land; and

(iii) to have an additional amount of fuel, to provide for the increased consumption on the occurrence of any of the potential contingencies specified by the operator to the satisfaction of the BCAA. (See AMC OPS 3.255)

(3) When no alternate heliport or landing location is available (e.g. the destination is isolated), sufficient fuel shall be carried to enable the helicopter to fly to the destination to which the flight is planned and thereafter for a period acceptable to the BCAA that will, based on geographic and environmental considerations, enable a safe landing to be made.

(d) The operator shall ensure that the planning of flights is only based upon:

(1) Procedures and data contained in or derived from the Operations Manual or current helicopter specific data; and

(2) The operating conditions under which the flight is to be conducted including:

(i) Realistic helicopter fuel consumption data;

(ii) Anticipated masses;

(iii) Expected meteorological conditions; and

(iv) Air Traffic Services procedures and restrictions.

(e) The operator shall ensure that the pre-flight calculation of usable fuel required for a flight includes: (see IEM OPS 3.255)

(1) Taxi fuel;

(2) Trip fuel;

(3) Reserve fuel consisting of:

(i) Contingency fuel (see IEM OPS 3.255(c)(3)(i));

(ii) Alternate fuel, if a destination alternate heliport is required (This does not preclude selection of the departure heliport or landing location as the destination alternate.);

(iii) Final reserve fuel; and

(iv) Additional fuel, if required by the type of operation (e.g. isolated heliports or landing location); and

(4) Extra fuel if required by the commander.

(f) The use of fuel after flight commencement for purposes other than originally intended during pre-flight planning shall require a re-analysis and, if applicable, adjustment of the planned operation.

(g) The operator shall ensure that in-flight replanning procedures for calculating usable fuel required when a flight has to proceed along a route or to a destination other than originally planned include:

(1) Trip fuel for the remainder of the flight;

(2) Reserve fuel consisting of:

(i) Contingency fuel;

(ii) Alternate fuel, if a destination alternate heliport is required. (This does not preclude selection of the departure heliport or landing location as the destination alternate.);

(iii) Final reserve fuel; and

(iv) Additional fuel, if required by the type of operation (e.g. isolated heliports or landing locations); and

(3) Extra fuel if required by the commander.

(h) The operator shall maintain fuel and oil records to enable the BCAA to ascertain that, for each flight, the above requirements have been complied with.

ANTR OPS 3.260 Carriage of Persons with Reduced Mobility
(See IEM OPS 3.260)

(a) The operator shall establish procedures for the carriage of Persons with Reduced Mobility (PRMs).

(b) The operator shall ensure that PRMs are not allocated, nor occupy, seats where their presence could:

(1) Impede the crew in their duties;

(2) Obstruct access to emergency equipment; or

(3) Impede the emergency evacuation of the helicopter.

(c) The commander must be notified when PRMs are to be carried on board.

ANTR OPS 3.265 Carriage of inadmissible passengers, deportees or persons in custody

The operator shall establish procedures for the transportation of inadmissible passengers, deportees or persons in custody to ensure the safety of the helicopter and its occupants. The commander must be notified when the above-mentioned persons are to be carried on board.

ANTR OPS 3.270 Stowage of baggage and cargo
(See Appendix 1 to ANTR OPS 3.270)
(See AMC OPS 3.270)

(a) The operator shall establish procedures to ensure that only such hand baggage and cargo is carried into a helicopter and taken into the passenger cabin as can be adequately and securely stowed.

(b) The operator shall establish procedures to ensure that all baggage and cargo on board, which might cause injury or damage, or obstruct aisles and exits if displaced, is stowed so as to prevent movement.

ANTR OPS 3.275 *Intentionally blank*

ANTR OPS 3.280 Passenger Seating
(See AC No. 1 to ANTR OPS 3.280)
(See AC No. 2 to ANTR OPS 3.280)

The operator shall establish procedures to ensure that passengers are seated where, in the event that an emergency evacuation is required, they may best assist and not hinder evacuation from the helicopter.

ANTR OPS 3.285 Passenger briefing

The operator shall ensure that:

(a) *General.*

(1) Passengers are verbally briefed about safety matters, parts or all of which may be given by an audio-visual presentation.

(2) Passengers are provided with a safety briefing card on which picture type instructions indicate the operation of emergency equipment and exits likely to be used by passengers.

(b) *Before take-off*

(1) Passengers are briefed on the following items (but not limited to) if applicable:

(i) Smoking regulations;

(ii) Back of the seat to be in the upright position and tray table stowed;

(iii) Location and method of opening of emergency exits;

(iv) Location and use of floor proximity escape path markings;

(v) Stowage of hand baggage;

(vi) Restrictions on the use of portable electronic devices; and

(vii) The location and the contents of the safety briefing card, and,

(viii) Window blinds are in position to see outside,

(2) Passengers receive a demonstration (but not limited to) of the following:

(i) The use of safety belts and/or safety harnesses, including how to fasten and unfasten the safety belts and/or safety harnesses;

(ii) The location and use of oxygen equipment if required (ANTR OPS 3.770 and ANTR OPS 3.775 refer). Passengers must also be briefed to extinguish all smoking materials when oxygen is being used; and

(iii) The location and use of life jackets if required (ANTR OPS 3.825 refers).

(c) *After take-off*

(1) Passengers are reminded of the following (but not limited to) if applicable:

(i) Smoking regulations; and

(ii) Use of safety belts and/or safety harnesses including the safety benefits of having safety belts fastened when seated irrespective of seat belt sign illumination.

(d) *Before landing*

(1) Passengers are reminded of the following (but not limited to) if applicable:

(i) Smoking regulations;

(ii) Use of safety belts and/or safety harnesses;

(iii) Back of the seat to be in the upright position and tray table stowed;

(iv) Re-stowage of hand baggage; ~~and~~

(v) Window blinds are in position to see outside and,

(vi) Restrictions on the use of portable electronic devices.

(e) *After landing*

(1) Passengers are reminded of the following (but not limited to):

(i) Smoking regulations; and

(ii) Use of safety belts and/or safety harnesses.

(f) In an emergency during flight, passengers are instructed in such emergency action as may be appropriate to the circumstances.

Note : Guidance on passenger safety briefing can be found in the Manual on Information and Instructions for Passenger Safety *(ICAO Doc 10086).*

ANTR OPS 3.290 Flight preparation

(a) The operator shall ensure that an operational flight plan is completed for each intended flight.

(b) The commander shall not commence a flight unless he is satisfied that:

(1) The helicopter is airworthy and the appropriate certificates (i.e. airworthiness, registration) are on board the helicopter;

(2) The helicopter configuration is in accordance with the Configuration Deviation List (CDL);

(3) The instruments and equipment required for the flight to be conducted, in accordance with OPS Part 3, Subparts K and L, are available;

(4) The instruments and equipment are in operable condition except as provided in the MEL;

(5) Those parts of the operations manual which are required for the conduct of the flight are available;

(6) The documents, additional information and forms required to be available by ANTR OPS 3.125 and ANTR OPS 3.135 are on board;

(7) Current maps, charts and associated documents or equivalent data are available to cover the intended operation of the helicopter including any diversion which may reasonably be expected;

(8) Weather reports and forecasts - Before commencing a flight, the pilot-in-command shall be familiar with all available meteorological information appropriate to the intended flight. Preparation for a flight away from the vicinity of the place of departure, and for every flight under IFR, shall include:

a) a study of available current weather reports and forecasts; and

b) the planning of an alternative course of action to provide for the eventuality that the flight cannot be completed as planned because of weather conditions.

Note: The requirements for flight plans are contained in Annex 2 and the PANS-ATM (ICAO DOC 4444).

(9) Ground and/or water facilities and services required for the planned flight are available and adequate;

(10) The provisions specified in the operations manual in respect of fuel, oil and oxygen requirements, minimum safe altitudes, heliport or landing location operating minima and availability of alternate heliports or landing locations, where required, can be complied with for the planned flight;

(11) The load is properly distributed and safely secured;

(12) The mass of the helicopter, at the commencement of take-off, will be such that the flight can be conducted in compliance with OPS Part 3, Subparts F to I as applicable; and

(13) Any operational limitation in addition to those covered by sub-paragraphs (9) and (11) above can be complied with.

ANTR OPS 3.295 Selection of Heliports or Landing Locations

(See AMC OPS 3.295(c)(1))
(See IEM OPS 3.295(c)(1))

(a) The operator shall establish procedures for the selection of destination and/or alternate heliports or landing locations in accordance with ANTR OPS 3.220 when planning a flight.

(b) The commander must select a take-off alternate heliport within one hour flight time atnormal cruise speed for a flight under instrument meteorological conditions if it would not be possible to return to the heliport or landing location of departure due to meteorological reasons.

(c) A flight to be conducted in accordance with IFR shall not be commenced unless information is available which indicates that conditions at the destination heliport or landing location or, when an alternate is required, at least one alternate heliport will, at the estimated time of arrival, be at or above the heliport operating minima.

(d) On a VFR flight a commander shall not commence take-off unless current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions along the route or that part of the route to be flown under VFR will, at the appropriate time, be such as to enable compliance with these regulations.

Note: When a flight is conducted in accordance with VFR, the use of night vision imaging systems (NVIS) or other vision enhancing systems does not diminish the requirement to comply with this provisions.

(e) In addition to (c) or (d) above, for a flight to be conducted in accordance with the Instrument Flight Rules or when flying VFR and navigating by means other than by reference to visual landmarks, the commander shall specify at least one alternate heliport in the operational flight plan unless:

(1) The destination is a coastal heliport or landing location (See AMC OPS 3.295(c)(1)and IEM OPS 3.295(c)(1)); or

(2) For a flight to any other land destination, the duration of the flight and the meteorological

conditions prevailing are such that, at the estimated time of arrival at the heliport or landing location of intended landing, an approach and landing may be made under visual meteorological conditions as prescribed by the BCAA; or

(3) The heliport or landing location of intended landing is isolated and no alternate is available. A Point of No Return (PNR) shall be determined.

(f) The operator must select two destination alternatives when:

(1) The appropriate weather reports or forecasts for the destination, or any combination thereof, indicate that during a period commencing 1 hour before and ending 1 hour after the estimated time of arrival the weather conditions will be below the applicable planning minima; or

(2) no meteorological information is available for the destination.

(g) Offshore destination alternate heliport

(1) The State of the Operator shall issue a specific approval for the operational use of offshore destination alternate heliports.

(2) A helideck may be specified as an offshore destination alternate heliport when the closest onshore destination alternate is not within achievable range of the helicopter. Specification is subject to the following conditions:

(i) a helideck shall only be used as an offshore destination alternate heliport after the PNR and when an onshore aerodrome is not geographically available. Prior to the PNR, an onshore destination alternate aerodrome shall be used;

(ii) the operator shall have a risk assessment process detailed in the operations manual for the utilization of helidecks as offshore destination alternate heliports and conduct such an assessment prior to their selection and use;

(iii) the operator has established specific procedures and appropriate training programmes in the operations manual for offshore destination alternate heliport operations;

(iv) the operator shall have pre-surveyed, and assessed for suitability, any helideck intended to be used as an offshore destination alternate heliport and with the information published in an appropriate form in the operations manual (including the orientation of the helideck);

(v) the helicopter shall have a one engine inoperative (OEI) landing capability at the offshore alternate heliport; and

(vi) the MEL shall contain specific provisions for this type of operation.

(3) The use of an offshore alternate heliport should be restricted to helicopters which can achieve OEI in ground effect (IGE) hover at an appropriate power rating at the offshore alternate heliport.

(4) Where the surface of the helideck, or prevailing conditions (especially wind velocity), precludes an OEI IGE, OEI out of ground effect (OGE) hover performance at an appropriate power rating should be used to compute the landing mass.

(5) The landing mass should be calculated from graphs provided in the operations manual. When calculating this landing mass, due account should be taken of helicopter

configuration, environmental conditions and the operation of systems that have an adverse effect on performance.

(6) The planned landing mass of the helicopter, including crew, passengers, baggage, cargo and 30 minutes final reserve fuel, should not exceed the OEI landing mass at the time of approach to the offshore alternate heliport.

(7) The operator's risk assessment process shall take into consideration at least the following:

(i) The type and circumstances of the operation;

(ii) The area / terrain over which the operation is being conducted, including sea conditions, survivability and search and rescue facilities;

(iii) The probability of, and length of exposure to, a critical engine failure and the tolerability of such an event;

(iv) The availability and suitability of the helideck for use as an offshore destination alternate heliport including the physical characteristics, dimensions, configuration and obstacle clearance, the effect of wind direction, strength and turbulence;

(v) The type of helicopter(s) being used;

(vi) Mechanical reliability of the helicopter engines and critical control systems and components; the operator should install and utilize a health and usage monitoring system with tailored criteria for this type of operation.

(vii) The procedure and systems for monitoring and maintaining the reliability of the engine(s)

(viii) The training and operational procedures, including mitigation of the consequences of helicopter technical failures and the critical engine failure;

(ix) Specific mitigation measures;

(x) Helicopter equipment;

(xi) spare payload capacity for the carriage of additional fuel;

(xii) weather minima, taking into account the accuracy and reliability of meteorological information; and communications and aircraft tracking facilities.

(xiii) communications and aircraft tracking facilities.

Note 1: The landing technique specified in the flight manual following control system failure may preclude the nomination of certain helidecks as alternate heliports.

Note 2: Specific mitigation measures may include equipment improvements such as a sea state certification standard, safety equipment and tracking equipment.

Note 3: Guidance on conduct of the risk assessment to allow for variations to the need for a safe forced landing, including mitigation strategies to reduce the risk, is contained in ICAO DOC 10110.

(8) Training programmes should ensure that the requirements of ANTR OPS 3, 3.975 are

complied with, such as, but not limited to, route qualification, flight preparation, concept of operations with offshore alternates and criteria for their use. Training programme refers to the training for pilots and other relevant personnel (including as required meteorological observers and helideck personnel) involved in such operations.

(9) When the use of an offshore alternate heliport is planned, the meteorological observations, both at the offshore destination and the offshore alternate heliport, should be taken by an observer acceptable to the designated meteorological authority.

Note: Appropriate automatic weather stations may satisfy this requirement.

(10) Offshore alternates should not be used for payload enhancement.

(11) To demonstrate the mechanical reliability of critical control systems and critical components of the helicopter, the operator should install and utilize a health and usage monitoring system with tailored criteria for this type of operation.

(12) The heliport operating minima for the offshore destination and offshore destination alternate heliport required under ANTR OPS 3.430(f) ~~2.2.8.2~~ shall make due allowance for the availability and reliability of weather information and the geographic environment.

(13) The operator shall specify cloud ceiling and visibility criteria relevant to the helideck elevation and location.

(14) To use an offshore destination alternate helideck, it shall be ensured that, within 60 NM of the destination helideck and alternate helideck, fog is not present nor forecasted during the period commencing one hour before and ending one hour after the expected time of arrival at the offshore destination or alternate helideck.

(15) An offshore alternate should be more than 30 NM from the original destination to reduce the likelihood of a localized weather event precluding landings at both the destination and ~~the alternate~~ the offshore destination alternate heliport/helideck.

(16) The operator shall ensure that, before passing the PNR, the following actions have been completed:

(i) confirmation that navigation to the destination and offshore alternate heliport is assured;

(ii) radio contact with the destination and offshore alternate heliport (or master station) is established;

(iii) the landing forecast at the destination and offshore alternate heliport are obtained and confirmed to be at or above the required minima;

(iv) the requirements for OEI landing are verified against the latest reported weather conditions to ensure that they can be met; and

(v) to the extent possible, having considered information on current and forecast use of the offshore destination alternate heliport, and on conditions prevailing, the availability of the offshore alternate heliport will be guaranteed by the helideck provider until the landing at the destination, or the offshore destination alternate heliport, is achieved.

(h) The operator shall specify any required alternate(s) in the operational flight plan.

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

Note: Guidance on the selection of these incremental values is contained in the Flight Planning and Fuel Management (FPFM) Manual (ICAO DOC 9976).

ANTR OPS 3.297 Planning minima for IFR flights

(a) Planning minima for take-off alternates. The operator shall not select a heliport or landing location as a take-off alternate heliport or landing location unless the appropriate weather reports or forecasts and aerodrome or landing forecasts, or any combination thereof indicate that, during a period commencing 1 hour before and ending 1 hour after the estimated time of arrival at the take-off alternate heliport or landing location, the weather conditions will be at or above the applicable landing minima specified in accordance with ANTR OPS 3.225. The ceiling must be taken into account when the only approaches available are non-precision approaches. Any limitation related to one engine inoperative operations must be taken into account.

(b) Planning minima for destination and destination alternate heliports or landing locations. The operator shall only select the destination heliport or landing location and/or destination alternate heliport(s) or landing location(s) when the appropriate weather reports or forecasts and aerodrome or landing forecasts, or any combination thereof, indicate that, during a period commencing 1 hour before and ending 1 hour after the estimated time of arrival at the heliport or landing location, the weather conditions will be at or above the applicableplanning minima as follows:

(1) Except as provided in ANTR OPS 3.295(e), planning minima for a destination heliport or landing location will be:

(i) RVR/visibility specified in accordance with ANTR OPS 3.225; and

(ii) For a non-precision approach, the ceiling at or above MDH; and

(2) Planning minima for destination alternate heliport(s) or landing location(s):

Table 1 Planning minima destination alternates

Type of Approach	Planning Minima
Cat II and III	Cat I (Note 1)
Cat I	Plus 200ft/400m visibility
Non-Precision	Non-Precision (Note 2) plus 200ft/400 m visibility

Note 1 RVR.

Note 2 The ceiling must be at or above the MDH.

ANTR OPS 3.300 Submission of ATS Flight Plan

(See AMC OPS 3.300)

The operator shall ensure that a flight is not commenced unless an ATS flight plan has been submitted, or adequate information has been deposited, or transmitted as soon as possible after take-off, in order to permit alerting services to be activated if required.

ANTR OPS 3.305 Refuelling with passengers on board or rotors turning
(See Appendix 1 to ANTR OPS 3.305)
(See IEM OPS 3.305)

Note: Except where otherwise stated, all helicopter refuelling provisions relate to operations using jet fuels. See ANTR OPS 3.307 for restrictions specific to AVGAS/wide cut fuels.

(a) A helicopter shall not be refuelled, rotors stopped or turning, when:

(1) passengers are embarking or disembarking; or

(2) when oxygen is being replenished.

(b) When the helicopter is refuelled with passengers on board, rotors stopped or turning, it shall be properly attended by sufficient qualified personnel, ready to initiate and direct an evacuation of the helicopter by the most practical, safe and expeditious means available. In order to achieve this:

(1) the flight crew shall ensure that the passengers are briefed on what actions to take if an incident occurs during refuelling;

(2) a constant two-way communication shall be maintained by the helicopter's intercommunication system or other suitable means between the ground crew supervising the refuelling and the qualified personnel on board the helicopter; and

Note: Caution needs to be exercised when using radios for this purpose due to the potential for stray currents and radio-induced voltages.

(3) during an emergency shutdown procedure, the flight crew shall ensure that any personnel or passengers outside the helicopter are clear of the rotor area.

(c) The operator shall establish procedures and specify conditions under which such refuelling may be carried out.

(d) A helicopter shall not be defueled at any time when:

(1) passengers remain on board; or

(2) passengers are embarking or disembarking; or

(3) oxygen is being replenished.

Note 1: Provisions concerning aircraft refuelling are contained in Annex 14, Volume I, and guidance on safe refuelling practices is contained in the Airport Services Manual *(Doc 9137), Parts 1 and 8.*

Note 2: Additional precautions are required when refuelling with fuels other than aviation kerosene or when refueling results in a mixture of aviation kerosene with other aviation turbine fuels, or when an open line is used.

ANTR OPS 3.307 Refuelling/defueling with wide-cut fuel
(See IEM OPS 3.307)

Helicopter shall not be refuelled with AVGAS (aviation gasoline) or wide-cut type fuel or a mixture of these types of fuel, when passengers are on board.

ANTR OPS 3.310 Crew Members at stations

(a) *Flight crew members*

(1) During taxi, take-off and landing each flight crew member required to be on duty in the cockpit shall be at his station.

(2) During all other phases of flight each flight crew member required to be on duty shall remain at his station unless his absence is necessary for the performance of his duties in connection with the operation, or for physiological needs, provided at least one suitably qualified pilot remains at the controls of the helicopter at all times.

(b) *Cabin crew members*. On all the decks of the helicopter that are occupied by passengers, required cabin crew members shall be seated at their assigned stations during taxi, take-off and landing, and whenever deemed necessary by the commander in the interest of safety.(See IEM OPS 3.310(b).)

ANTR OPS 3.313 Use of Headset

(a) Each flight crew member required to be on flight deck duty shall wear the headset with boom microphone, or equivalent required by ANTR-OPS 3.647, and use it as the primary device to listen to the voice communications with Air Traffic Services:

(1) on the ground when engine(s) is (are) running;

(2) in flight, and

(3) whenever deemed necessary by the commander.

(b) In the conditions of paragraph (a) above, the boom microphone or equivalent shall be in a position which permits its use for two-way radio communications.

ANTR OPS 3.315 *Intentionally blank*

ANTR OPS 3.320 Seats, safety belts and harnesses

(a) *Crew members*

(1) During taxi, take-off and landing, and whenever deemed necessary by the commander in the interest of safety, each crew member shall be properly secured by all safetybelts and harnesses provided.

Note: The foregoing does not preclude the pilot-in-command from directing the fastening of the seat belt only, at times other than during take-off and landing.

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

(2) During other phases of the flight each flight crew member in the cockpit shall keep his safety belt fastened while at his station.

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

(b) *Passengers*

(1) Before take-off and landing, and during taxiing, and whenever deemed necessary inthe interest of safety, the commander shall ensure that each passenger on board occupies a seat or berth with his safety belt, or harness where provided, properly secured.

(2) The operator shall make provision for, and the commander shall ensure that multiple occupancy of helicopter seats may only be allowed on specified seats and does not occur other than by one adult and one infant who is properly secured by a supplementary loop belt or other restraint device.

ANTR OPS 3.325 Securing of passenger cabin and galley(s)

(a) The operator shall establish procedures to ensure that before taxiing, take-off and landing all exits and escape paths are unobstructed.

(b) The commander shall ensure that before take-off and landing, and whenever deemed necessary in the interest of safety, all equipment and baggage is properly secured.

ANTR OPS 3.330 Accessibility of emergency equipment

The operator shall establish procedures to ensure that when operating overwater in Performance Class 3, account is taken of the duration of the flight and conditions to be encountered when deciding if the lifejackets should be worn by all occupants.

The commander shall ensure that relevant emergency equipment remains easily accessible for immediate use.

ANTR OPS 3.335 Smoking on board

(a) The commander shall ensure that no person on board is allowed to smoke:

(1) Whenever deemed necessary in the interest of safety;

(2) While the helicopter is on the ground unless specifically permitted in accordance with procedures defined in the Operations Manual;

(3) Outside designated smoking areas, in the aisle(s) and in the toilet(s);

(4) In cargo compartments and/or other areas where cargo is carried which is not stored in flame resistant containers or covered by flame resistant canvas; and

(5) In those areas of the cabin where oxygen is being supplied.

ANTR OPS 3.340 Meteorological Conditions

(a) A flight shall not be continued towards the heliport of intended landing, unless the latest available information indicates that at the expected time of arrival, a landing can be affected at that heliport, or at least one destination alternate heliport, in compliance with VFR or the operating minima established in accordance with OPS 3.297.

(b) A flight to a helideck or elevated heliport or landing location shall not be operated when the mean wind speed at the helideck or elevated heliport is reported as 60 knots or more.

ANTR OPS 3.345 Ice and other contaminants – ground procedures

(a) The operator shall establish procedures to be followed when ground de-icing and anti-icing and related inspections of the helicopter(s) are necessary.

(b) A flight to be planned or expected to operate in suspected or known ground icing conditions, a commander shall not commence take-off unless the external surfaces are clear of any deposit (accumulation of ice or other naturally occurring contaminants) which might adversely affect the performance and/or controllability of the helicopter except as permitted in the Helicopter Flight Manual.

Note: Guidance material is given in the Manual of Aircraft Ground De-icing/Anti-icing Operations (ICAO DOC 9640).

ANTR OPS 3.346 Ice and other contaminants – flight procedures

(a) When appropriate, the operator shall establish procedures for flights in expected or actual icing conditions. (See AC OPS 3.346 and ANTR OPS 3.675)

(b) A commander shall not commence a flight nor intentionally fly into expected or actual icing conditions unless the helicopter is certificated and equipped to cope with such conditions.

ANTR OPS 3.350 Fuel and oil requirements

~~A commander shall not commence a flight unless he is satisfied that the helicopter carries at least the planned amount of fuel and oil to complete the flight safely, taking into account the expected operating conditions.~~

A flight shall not be commenced unless, taking into account both the meteorological conditions and any delays that are expected in flight, the helicopter carries sufficient fuel and oil to ensure that it can safely complete the flight. In addition, a reserve shall be carried to provide for contingencies.

ANTR OPS 3.355 Take-off conditions

Before commencing take-off, a commander must satisfy himself that, according to the information available to him, the weather at the heliport or landing location and the condition of the FATO intended to be used should not prevent a safe take-off and departure.295

ANTR OPS 3.360 Application of take-off minima

Before commencing take-off, a commander must satisfy himself that the RVR/visibility and the ceiling in the take-off direction of the helicopter is equal to or better than the applicable minimum.

ANTR OPS 3.365 Minimum flight altitudes
(See IEM OPS 3.250)

The pilot flying shall not descend below specified minimum altitudes except when necessary for take-off or landing, or when descending in accordance with procedures approved by the BCAA.

ANTR OPS 3.370 Simulated abnormal situations in flight

The operator shall establish procedures to ensure that abnormal or emergency situations requiring the application of part or all of abnormal or emergency procedures and simulation of IMC by artificial means, are not simulated when passenger or cargo carried on board either during commercial air transportation flights or private flight operations.

ANTR OPS 3.375 In-flight fuel management
(See Appendix 1 to ANTR-OPS 3.375)

The operator must establish policies and procedures to ensure that in-flight fuel checks and fuel management are carried out according to following criteria:

(a) In-flight fuel checks.

(1) A commander must ensure that fuel checks are carried out in-flight at regular intervals. The usable remaining fuel must be recorded and evaluated to:

(i) compare actual consumption with planned consumption;

(ii) check that the usable remaining fuel is sufficient to complete the flight, in accordance with paragraph (b) 'In-flight fuel management' below; and

(iii) determine the expected usable fuel remaining on arrival at the destination aerodrome.

(2) The relevant fuel data must be recorded.

(b) In-flight fuel management.

(1) The flight must be conducted so that the expected usable fuel remaining on arrival at the destination aerodrome is not less than:

(i) the required alternate fuel plus final reserve fuel, or

(ii) the final reserve fuel if no alternate aerodrome is required

(2) However, if, as a result of an in-flight fuel check, the expected usable fuel remaining on arrival at the destination aerodrome is less than:

(i) the required alternate fuel plus final reserve fuel, the commander must request delay information from ATC and take into account the traffic and the operational conditions prevailing at the destination aerodrome, at the destination alternate aerodrome and at any other adequate aerodrome, in deciding whether to proceed to the destination aerodrome or to divert so as to perform a safe landing with not less than final reserve fuel, or

(ii) the final reserve fuel if no alternate aerodrome is required, the commander must take appropriate action and proceed to an adequate aerodrome so as to perform a safe landing with not less than final reserve fuel.

Note: The protection of final reserve fuel is intended to ensure a safe landing at any aerodrome when unforeseen occurrences may not permit safe completion of an operation as originally planned. Guidance on flight planning including the circumstances that may require re-analysis, adjustment and/or re-planning of the planned operation before take-off or en-route, is contained in the ICAO Flight Planning and Fuel Management Manual (ICAO DOC 9976).

(3) The commander shall advise ATC of a minimum fuel state by declaring "MINIMUM FUEL" when, having committed to land at a specific landing site / aerodrome, the

commander calculates that any change to the existing clearance (including delay), to that landing site / aerodrome may result in landing with less than planned final reserve fuel.

Note 1: The declaration of "MINIMUM FUEL" informs ATC that all planned aerodrome options have been reduced to a specific aerodrome of intended landing and any change to the existing clearance may result in landing with less than planned reserve fuel. This is not an emergency situation but an indication that an emergency situation is possible should any additional delay occur.

Note 2: Guidance on declaring minimum fuel is contained in the ICAO Flight Planning Fuel Management Manual (ICAO DOC 9976).

Note 3: A precautionary landing site refers to a landing site, other than the site of intended landing, where it is expected that a safe landing can be made prior to the consumption of the planned final reserve fuel.

(4) The commander shall declare a situation of fuel emergency by broadcasting "MAYDAY MAYDAY MAYDAY FUEL", when usable fuel estimated to be available upon landing, at the nearest landing site / adequate aerodrome where a safe landing can be performed, is less than final reserve fuel.

Note:1 The planned final reserve fuel refers to the value calculated in ANTR OPS 3.255 & 3. 350 and is the minimum amount of fuel required upon landing at any landing site. The declaration of "MAYDAY FUEL" informs ATC that all available landing options have been reduced to a specific site and a portion of the final reserve fuel may be consumed prior to landing.

Note: 2 The pilot estimates with reasonable certainty that the fuel remaining upon landing at the nearest safe landing site will be less than the final reserve fuel, taking into consideration the latest information available, the area to be overflown (i.e. with respect to the availability of precautionary landing areas), meteorological conditions and other reasonable contingencies.

Note: 3 The words "MAYDAY FUEL" describe the nature of the distress conditions.

ANTR OPS 3.380 *Intentionally blank*

ANTR OPS 3.385 Use of supplemental oxygen

A commander shall ensure that flight crew members engaged in performing duties essential to the safe operation of a helicopter in flight use supplemental oxygen continuously whenever cabin altitude exceeds 10 000 ft for a period in excess of 30 minutes and whenever the cabin altitude exceeds 13 000 ft.

ANTR OPS 3.390 *Intentionally blank*

ANTR OPS 3.395 Ground proximity detection

When undue proximity to the ground is detected by any flight crew member or by a ground proximity warning system, the commander or the pilot to whom conduct of the flight has been delegated shall ensure that corrective action is initiated immediately to establish safe flight conditions.

ANTR OPS 3.398 Use of Airborne Collision Avoidance System (ACAS)
(See AC OPS 3.398)

(a) The operator shall establish procedures to ensure that when ACAS is installed and serviceable, it shall be used in flight in a mode that enables Traffic Advisories (TA) to be displayed.

(b) Operators of aircraft equipped with ACAS shall establish standards of training and operation before authorising crews to use ACAS.

ANTR OPS 3.400 Approach and landing conditions
(See IEM OPS 3.400)

Before commencing an approach to land, the commander must satisfy himself that, according to the information available to him, the weather at the heliport or landing location and the condition of the FATO intended to be used should not prevent a safe approach, landing or missed approach, havingregard to the performance information contained in the Operations Manual.

ANTR OPS 3.405 Commencement and continuation of approach

(a) The commander or the pilot to whom conduct of the flight has been delegated may commence an instrument approach regardless of the reported runway visual range/visibility (RVR/VIS).

(b) If the reported RVR/VIS is less than the applicable minimum ~~(See IEM OPS 3.405(a))~~, the approach shall not be continued:

(1) below 1 000 ft above the aerodrome; or

(2) into the final approach segment in the case where the decision altitude/height (DA/H) or minimum descent altitude/height (MDA/H) is more than 1 000 ft above the aerodrome.

(c) Where the RVR is not available, RVR values may be derived by converting the reported visibility in accordance with Appendix 1 to ANTR OPS 3.430, sub- paragraph (h).

(d) If, after passing 1 000 ft above the aerodrome, the reported RVR/VIS falls below the applicable minimum, the approach may be continued to DA/H or MDA/H.

(e) The approach may be continued below DA/H or MDA/H and the landing may be completed provided that the visual reference adequate for the type of approach operation and for the intended runway is established at the DA/H or MDA/H and is maintained.

(f) The touchdown zone RVR shall always be controlling. If reported and relevant, the mid point and stop end RVR are also controlling. The minimum RVR value for the mid-point is 125 m or the RVR required for the touch-down zone if less, and 75 m for the stop-end. For helicopters equipped with a roll-out guidance or control system, the minimum RVR value for the mid-point is 75 m.

ANTR OPS 3.410 *Intentionally Blank*

ANTR OPS 3.415 Journey log

A commander shall ensure that the Journey log is completed.

ANTR OPS 3.420 Occurrence reporting

(a) Terminology

(1) *Incident.* An occurrence, other than an accident, associated with the operation of a helicopter which affects or could affect the safety of operation.

(2) *Serious Incident.* An incident involving circumstances indicating that an accident nearly

occurred.

(3) *Accident.* An occurrence associated with the operation of a helicopter which takes place between the time any person boards the helicopter with the intention of flightuntil such time as all persons have disembarked, in which:

(i) a person is fatally or seriously injured as a result of:

(A) being in the helicopter;

(B) direct contact with any part of the helicopter, including parts which have become detached from the helicopter; or,

(C) direct exposure to jet blast or rotor downwash;

except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew: or

(ii) the helicopter sustains damage or structural failure which adversely affects the structural strength, performance or flight characteristics; and would normally require major repair or replacement of the affected component; except for engine failure or damage, when the damage is limited to the engine, its cowlings or accessories; or for damage limited to, antennas, tyres, brakes, fairings, smalldents or puncture holes in the helicopter skin: or

(iii) the helicopter is missing or is completely inaccessible.

(b) *Incident Reporting.* The operator shall establish procedures for reporting incidents taking into account responsibilities described below and circumstances described in sub-paragraph (d) below.

(1) ANTR OPS 3.085(b) specifies the responsibilities of crew members for reporting incidents that endanger, or could endanger, the safety of operation.

(2) The commander or the operator of a helicopter shall submit a report to the BCAA of any incident that endangers or could endanger the safety of operation.

(3) Reports shall be despatched within 72 hours of the time when the incident was identified unless exceptional circumstances prevent this.

(4) A commander shall ensure that all known or suspected technical defects and all exceedences of technical limitations occurring while he was responsible for the flight are recorded in the helicopter technical log. If the deficiency or exceedence of technical limitations endangers or could endanger the safety of operation, the commander must in addition initiate the submission of a report to the BCAA in accordance with paragraph (b)(2) above.

(5) In the case of incidents reported in accordance with sub- paragraphs (b)(1), (b)(2) and (b)(3) above, arising from, or relating to, any failure, malfunction or defect in the helicopter, its equipment or any item of ground support equipment, or which cause or might cause adverse effects on the continuing airworthiness of the helicopter, the operator must also inform the organisation responsible for the design or the supplier or, if applicable, the organisation responsible for continued airworthiness, at the same time as a report is submitted to the BCAA.

(c) *Accident and Serious Incident Reporting.* The operator shall establish procedures for reporting accidents and serious incidents taking into account responsibilities described below and circumstances described in sub-paragraph (d) below.

(1) A commander shall notify the operator of any accident or serious incident occurring while he was responsible for the flight. In the event that the commander is incapable of providing such notification, this task shall be undertaken by any other member of the crew if they are able to do so, note being taken of the succession of command specified by the operator.

(2) The operator shall ensure that the authority in the State of the operator, the nearest appropriate Authority (if not the authority in the State of the operator), and any other organisation required by the State of the operator to be informed, are notified by the quickest means available of any accident or serious incident and - in the case of accidents only - at least before the helicopter is moved unless exceptional circumstances prevent this.

(3) The commander or the operator of a helicopter shall submit a report to the BCAA in the State of the operator within 72 hours of the time when the accident or serious incident occurred.

(d) *Specific Reports*. Occurrences for which specific notification and reporting methods must be used are described below;

(1) *Air Traffic Incidents*. A commander shall without delay notify the air traffic service unit concerned of the incident and shall inform them of his intention to submit an air traffic incident report after the flight has ended whenever a helicopter in flight has been endangered by:

(i) A near collision with any other flying device;

(ii) Faulty air traffic procedures or lack of compliance with applicable procedures by air traffic services or by the flight crew;

(iii) Failure of air traffic services facilities.

In addition, the commander shall notify the BCAA of the incident.

(2) *Airborne Collision Avoidance System Resolution Advisory.* A commander shall notify the air traffic service unit concerned and submit an ACAS report to the BCAA, whenever a helicopter in flight has manoeuvred in response to an ACAS ResolutionAdvisory.

(3) *Bird Hazards and Strikes*

(i) A commander shall immediately inform the local air traffic service unit whenever a potential bird hazard is observed.

(ii) If he is aware that a bird strike has occurred, a commander shall submit a written bird strike report after landing to the BCAA whenever a helicopter for which he is responsible suffers a bird strike that results in significant damage to the helicopter or the loss or malfunction of any essential service. If the bird strike is discovered when the commander is not available, the operator is responsible for submitting the report.

(4) *In-flight Emergencies with Dangerous Goods on Board.* If an in-flight

emergency occurs and the situation permits, a commander shall inform the appropriate air traffic service unit of any dangerous goods on board. After the helicopter has landed, the commander shall, if the occurrence has been associated with and wasrelated to the transport of dangerous goods, comply also with the reporting requirements specified in ANTR OPS 3.1225.

(5) *Unlawful Interference* Following an act of unlawful interference on board a helicopter, the commander or, in his absence, the operator shall submit a report as soon as practicable to the local Authority and to the authority in the State of the operator. (See also ANTR OPS 3.1245)

(6) *Encountering Potential Hazardous Conditions.* A commander shall notify the appropriate air traffic services unit as soon as practicable whenever a potentially hazardous condition such as an irregularity in a ground or navigational facility, a meteorological phenomenon or a volcanic ash cloud is encountered during flight.

(e) *Meteorological observations*. The procedures for making meteorological observations on board aircraft in flight and for recording and reporting them are contained in Annex 3, the PANS-ATM (ICAO DOC 4444) and the appropriate Regional Supplementary Procedures (Doc 7030).

(f) The pilot-in-command shall report the runway braking action special air-report (AIREP) when the runway braking action encountered is not as good as reported by the Aerodrome Operator.

Note.— The procedures for making special air-reports regarding runway braking action are contained in the PANSATM (ICAO DOC 4444), Chapter 4 and Appendix 1.

ANTR-OPS 3.426 Flight hours reporting
(See AC OPS 3.426)

(a) The operator shall make available to the BCAA the hours flown for each helicopter operated during the previous calendar year.

Appendix 1 to ANTR OPS 3.270
Stowage of baggage and cargo

(a) Procedures established by the operator to ensure that hand baggage and cargo is adequately and securely stowed must take account of the following:

(1) Each item carried in a cabin must be stowed only in a location that is capable of restraining it;

(2) Mass limitations placarded on or adjacent to stowages must not be exceeded;

(3) Underseat stowages must not be used unless the seat is equipped with a restraint bar and the baggage is of such size that it may adequately be restrained by this equipment;

(4) Items must not be stowed in toilets or against bulkheads that are incapable of restraining articles against movement forwards, sideways or upwards and unless the bulkheads carry a placard specifying the greatest mass that may be placed there;

(5) Baggage and cargo placed in lockers must not be of such size that they prevent latched doors from being closed securely;

(6) Baggage and cargo must not be placed where it can impede access to emergency equipment; and

(7) Checks must be made before take-off, before landing, and whenever the fasten seat belts signs are illuminated or it is otherwise so ordered to ensure that baggage is stowed where it cannot impede evacuation from the aircraft or cause injury by falling (or other movement) as may be appropriate to the phase of flight.

Appendix 1 to ANTR OPS 3.305

Refuelling with passengers on board or rotors turning

(a) The operator must establish in accordance with the requirement at ANTR OPS 3.305, a detailed operational procedures for re/defueling with passengers on board, either rotors stopped or rotors turning, to ensure that the following precautions are taken (not limited to the following):

Passengers are briefed by the flight crew on what actions to take if an incident occurs during refuelling.

(1) Door(s) on the refuelling side of the helicopter shall remain closed where possible, unless these are the only suitable exits;

(2) Door(s) on the non-refuelling side of the helicopter shall remain open, weather permitting;

(3) Fire fighting facilities of the appropriate scale shall be positioned so as to be immediately available in the event of a fire; and

(4) Sufficient personnel shall be immediately available to move passengers clear of the helicopter in the event of a fire.

(5) Sufficient qualified personnel must be on board and be prepared for an immediate emergency evacuation;

(6) If the presence of fuel vapour is detected inside the helicopter, or any other hazard arises during re/defueling, fuelling must be stopped immediately;

(7) The ground area beneath the exits intended for emergency evacuation be kept clear;

Seat belts should be unfastened to facilitate rapid agress; and

With rotors running only ongoing passengers should remain on board.

(8) Provision is made for a safe and rapid evacuation;

(9) Two-way communications maintained by ***suitable means*** between the ground crew supervising the refuelling and the pilot/qualified personnel on board the helicopter.

Appendix 1 to ANTR OPS 3.375
In-flight fuel management

In-flight fuel management.

(1) If an on-shore destination, when two suitable, separate touchdown and lift-off areas are available and the weather conditions at the destination comply with those specified for planning in ANTR OPS 3.340(a)(2), the commander may permit alternate fuel to be used before landing at the destination.

(2) If, as a result of an in-flight fuel check on a flight to an isolated destination heliport or landing location, planned in accordance with AMC OPS 3.255 paragraph 3, the expectedfuel remaining at the point of last possible diversion is less than the sum of:

(i) Fuel to divert to a heliport or landing location selected in accordance with ANTR OPS 3.295(b);

(ii) Contingency fuel; and

(iii) Final reserve fuel, a commander must:

(iv) Divert; or

(v) Proceed to the destination provided that at on-shore destinations, two suitable, separate touchdown and lift-off areas are available at the destination and the expected weather conditions at the destination comply with those specified for planning in ANTR OPS 3.340(a)(2).

SUBPART E – ALL WEATHER OPERATIONS

Note: Whenever the use of Flight Simulator or Synthetic Training Device is required by this Subpart, it shall be approved in accordance with the requirements of ANTR- FSTD H.

ANTR OPS 3.430 Heliport or Landing Location Operating Minima - General

(See Appendix 1 to ANTR OPS 3.430)

(a) The BCAA requires the operator to establish, for each heliport or landing location planned to be used in operation, the landing location operating minima that are not lower than the values given in Appendix 1. The method of determination of such minima must be approved by BCAA. Such minima shall not be lower than any that may be established for such heliports or landing locations by the State in which the heliport is located, except when specifically approved by that State.

(b) Notwithstanding paragraph (a) above, in-flight calculation of minima for use at unplanned alternate heliports and/or for approaches utilising EVS shall be carried out in accordance with a method acceptable to the Authority.

Note: The above paragraph does not prohibit in-flight calculation of minima for a non-planned alternate heliport if carried out in accordance with an accepted method.

(c) The BCAA may approve operational credit(s) for operations with advanced aircraft. Where the operational credit relates to low visibility operations, the State of the Operator shall issue a specific approval. Such approvals shall not affect the classification of the instrument approach procedure. Operational credit includes:

(1) for the purposes of an approach ban (See ANTR OPS 3.405(b)), a minimum below the aerodrome operating minima;

(2) reducing or satisfying the visibility requirements; or

(3) requiring fewer ground facilities as compensated for by airborne capabilities.

Note 1: Guidance on operational and how to express the operational credit in the operations specifications shall be in accordancewith the Manual of All-Weather Operations (ICAO DOC 9365) ~~and the guidance as published by BCAA in this regard and the describes in detail~~.

Note 2: Information regarding a HUD or equivalent displays, including references to RTCA and EUROCAE documents, is contained in the Manual of All-Weather Operations (Doc 9365).

Note ~~2~~ 3: Automatic landing system (helicopter) - is an automatic approach using airborne systems which provide automatic control of the flight path, to a point aligned with the landing surface, from which the pilot can transition to a safe landing by means of natural vision without the use of automatic control.

(d) For issuing a specific approval for the operational credit, the operator shall submit the documentation to ensure that:

(1) the aircraft meets the appropriate airworthiness certification requirements;

(2) the information necessary to support effective crew tasks for the operation is

appropriately available to both pilots where the number of flight crew members specified in the operations manual is more than one;

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

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

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

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

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

Note:1 Guidance on safety risk assessments is contained in the Safety Management Manual (SMM) (Doc 9859).

Note: 2 Guidance on operational approvals is contained in the Manual of All-Weather Operations (Doc 9365).

(e) For operations with operational credit with minima above those related to low visibility operations, the State of the Operator shall establish criteria for the safe operation of the aircraft.

Note: Guidance on operational credit for operations with minima above those related to low visibility operations is contained in the Manual of All-Weather Operations (Doc 9365).

(f) In establishing the heliport or landing location operating minima which will apply to any particular operation, the operator must take full account of:

(i) The type, performance and handling characteristics of the helicopter;

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

(iii) The physical characteristics of the heliport, and direction of approach;

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

(v) The equipment available on the helicopter for the purpose of navigation, acquisition of visual references and/or control of the flight path, as appropriate, during the take- off, the approach, the flare, the hover, the landing, roll-out and the missed approach;

(vi) For the determination of obstacle clearance, the obstacles in the approach, missed approach areas and the obstacle clearance altitude/height for the instrument approach procedures;

(vii) The obstacles in the approach, missed approach and the climb-out areas required for the execution of contingency procedures and necessary clearance margins;

(viii) The obstacle clearance altitude/height for the instrument approach procedures; and

(ix) The means to determine and report meteorological conditions.

(x) The flight technique to be used during the final approach.

(xi) The obstacles in the climb-out areas and necessary clearance margins;

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

(2) Any minima that may be promulgated by the State of the Aerodrome

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

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

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

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

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

(iii) Category III (CAT III): a decision height lower than 30 m (100 ft) or no decision height and a runway visual range not less than not less than 300m or no runway visual range limitations;

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

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

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

(h) Category II and Category III instrument approach operations shall not be authorized unless RVR information is provided.

(i) The operator shall specify the method of determining aerodrome operating minima in theoperations manual.

(j) The minima for a specific approach and landing procedure shall only be used if all thefollowing conditions are met:

(i) the ground equipment shown on the chart required for the intended procedure is operative;

(ii) the aircraft systems required for the type of approach are operative;

(iii) the required aircraft performance criteria are met; and

(iv) the crew is appropriately qualified.

(i) For take-off in low visibility, the State of the Operator shall issue a specific approval for the minimum take-off RVR.

Note: In general, visibility for take-off is defined in terms of RVR. An equivalent horizontal visibility may also be used.

(j) For instrument approach operations, heliport or landing location operating minima below 800 m visibility should not be authorized unless RVR information or an accurate measurement or observation of visibility is provided.

Note: Guidance on the operationally desirable and currently attainable accuracy of measurement or observation is given in Annex 3, Attachment B.

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

Note: For guidance on applying a continuous descent final approach (CDFA) flight technique on non-precision approach procedures, refer to PANS-OPS (Doc 8168) Volume I, Part II, Section 5.

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

ANTR OPS 3.435 Terminology

(a) Terms used in this Subpart and not defined in ANTR Volume 1 have the following meaning:

(1) *Circling*. The visual phase of an instrument approach to bring an aircraft into position for landing which is not suitably located for a straight-in approach.

(2) *Low Visibility Procedures (LVP)*. Procedures applied at a heliport or landing location for the purpose of ensuring safe operations during Category II and III approaches and Low Visibility Take-offs.

(3) *Low Visibility Take-Off (LVTO)*. A take-off where the Runway Visual Range (RVR) is less than 400 m.

(4) *Final Approach and Take-Off area (FATO)*. A defined area over which the final phase of the approach manoeuvre to hover or landing is completed and from which the take- off manoeuvre is commenced and, where the FATO is to be used by helicopters operated in *Visual Approach.* An approach by an IFR flight when either part or all of an instrument approach procedure is not completed and the approach is executed with visual reference to the terrain.

(5) *Cloud base.* The height of the base of the lowest observed, or forecast, cloud element in the vicinity of an aerodrome, or heliport or landing location, or within a specified area of operations. The height of the cloud base is normally measured above aerodrome

elevation, but in the case of offshore operations cloud base in measured above mean sea level.

ANTR OPS 3.440 Low visibility operations - General operating rules

(See Appendix 1 to ANTR-OPS 3.440)

(EASA SPA.LVO.105)

~~(a) The operator shall not conduct Category II or III operations unless:~~

~~(1) Each helicopter concerned is certificated for operations with decision heights below 200 ft, or no decision height, and equipped in accordance with ANTR- AWO or an equivalent accepted by the BCAA;~~

~~(2) A suitable system for recording approach and/or automatic landing success and failure is established and maintained to monitor the overall safety of the operation;~~

~~(3) The operations are approved by the BCAA;~~

~~(4) The flight crew consists of at least 2 pilots;~~

~~(5) Decision Height is determined by means of a radio altimeter; and~~

~~(6) RVR information is provided~~

~~(b) The operator shall not conduct low visibility take-offs in less than 150 m RVR unless approved by the BCAA.~~

~~(6) Performance Class 1, includes the rejected take-off area available.~~

To obtain a specific approval, the operator shall demonstrate that:

(a) for low-visibility approach operations, LVTO operations in an RVR less than 125 m, and operations with operational credits, the aircraft has been certified for the intended operations;

(b) the flight crew members are competent to conduct the intended operation and a training and checking programme for the flight crew members and relevant personnel involved in the flight preparation has been established;

(c) operating procedures for the intended operations have been established;

(d) any relevant changes to the minimum equipment list (MEL) have been made;

(e) any relevant changes to the maintenance programme have been made;

(f) procedures have been established to ensure the suitability of aerodromes, including instrument flight procedures, for the intended operations; and

(g) for the intended operations, a safety assessment has been carried out, and performance indicators have been established to monitor the level of safety.

ANTR OPS 3.445 Low visibility operations - Heliport or Landing Location considerations

(a) The operator shall not use an heliport for Category II or III operations unless the heliport is approved for such operations by the State in which the heliport is located.

(b) The operator shall verify that Low Visibility Procedures (LVP) have been established, and will be enforced, at those heliports where low visibility operations are to be conducted.

ANTR OPS 3.450 Low visibility operations - Training and Qualifications
(See Appendix 1 to ANTR OPS 3.450)

EASA SPA.LVO.120

AMC1 SPA.LVO.120(a),

AMC2,

AMC3,

GM1 SPA.LVO.120(b),

AMC1 to 7 SPA.LVO.120(b),

GM1 to 3 SPA.LVO.120(b)

~~(a) The operator shall ensure that, prior to conducting Low Visibility Take-Off, Category II and III operations:~~

~~(1) Each flight crew member:~~

(i) ~~Completes the training and checking requirements prescribed in Appendix 1 including flight simulator training in operating to the limiting values of RVR and Decision Height appropriate to the operator's Category II/III approval;~~ and

(a) The operator shall ensure that the flight crew is competent to conduct the intended operations.

(b) The operator shall ensure that each flight crew member successfully completes training and checking for all types of LVOs and operations with operational credits for which an approval has been granted. Such training and checking shall:

(1) include initial and recurrent training and checking;

(2) include normal, abnormal and emergency procedures;

(3) be tailored to the type of technologies used in the intended operations; and

(4) take into account the human factor risks associated with the intended operations.

(c) The operator shall keep records of the training and qualifications of the flight crew members.

(d) The training and checking shall be conducted by appropriately qualified personnel. In the case of flight and flight simulation training and checking, the personnel providing the training and conducting the checks shall be qualified in accordance with ANTR FCL 1.

~~(2)~~ (1) The training and checking is conducted in accordance with a detailed syllabus approved by the BCAA and included in the Operations Manual. This training is in addition to that prescribed in OPS 3, Subpart N; and

~~(3)~~ (2) The flight crew qualification is specific to the operation and the helicopter type.

(i) Is qualified in accordance with Appendix 1;

ANTR OPS 3.455 Low Visibility operations - Operating Procedures (LVPs)
(See Appendix 1 to ANTR OPS 3.455)
SPA.LVO.125

~~(a) The operator must establish procedures and instructions to be used for Low Visibility Take-Off~~

~~and Category II and III operations. These procedures must be included in the Operations Manual and contain the duties of flight crew members during taxiing, take-off, approach, flare, the hover, landing, roll-out and missed approach as appropriate.~~

~~(b) The commander shall satisfy himself that:~~

~~(1) The status of the visual and non-visual facilities is sufficient prior to commencing a Low Visibility Take-Off or a Category II or III approach;~~

~~(2) Appropriate LVPs are in force according to information received from Air Traffic Services, before commencing a Low Visibility Take-Off or a Category II or III approach; and~~

(3) ~~The flight crew members are properly qualified prior to commencing a Low Visibility Take-off in an RVR of less than 150 m or a Category II or III approach~~.

(a) The operator shall establish procedures and instructions to be used for LVOs. These procedures and instructions shall be included in the operations manual or procedures manual and contain the duties of flight crew members during taxiing, take-off, approach, flare, landing, rollout and missed approach operations, as appropriate.

(b) Prior to commencing an LVO, the pilot-in-command/commander shall be satisfied that:

(1) the status of the visual and non-visual facilities is sufficient;

(2) appropriate LVPs are in force according to information received from air traffic services (ATS);

(3) flight crew members are properly qualified.

ANTR OPS 3.460 Low visibility operations - Minimum equipment

(a) The operator must include in the Operations Manual the minimum equipment that has to be serviceable at the commencement of a Low Visibility Take-off or a Category II or III approach in accordance with the HFM or other approved document.

(b) The commander shall satisfy himself that the status of the helicopter and of the relevant airborne systems is appropriate for the specific operation to be conducted.

ANTR OPS 3.465 VFR Operating minima

(See Appendices 1 and 2 to ANTR OPS 3.465)

(a) The operator shall ensure that:

(1) VFR flights are conducted in accordance with the Visual Flight Rules and in accordance with the Table in Appendix 1 to ANTR OPS 3.465;

(2) Subject to sub-paragraph (3) and (4) below, helicopters are operated in a flight visibility of not less than 1 500 m during daylight and not less than 5 km by night. Flight visibility may be reduced to 800 m for short periods during daylight, when in sight of land, if the helicopter is manoeuvred at a speed that will give adequate opportunity to observe other traffic and any obstacles in time to avoid a collision (see AC OPS 3.465.). Low level overwater flights out of sight of land are only to be conducted under VFR when the cloud ceiling is greater than 600 ft by day and 1 200 ft by night.

(3) In Class G airspace, when flying between helidecks where the overwater sector is less

than 10 nm, VFR flights are conducted in accordance with Appendix 2 to ANTR OPS 3.465; and

(4) Special VFR flights comply with any State or Zone minima in force.

Appendix 1 to ANTR OPS 3.430

Heliport or Landing Location Operating Minima
(review as per EASA AIR OPS AMC2 CAT.OP.MPA.110)

(See IEM to Appendix 1 to ANTR OPS 3.430)

(a) *Take-off Minima*

(1) *General*

(i) Take-off minima established by the operator must be expressed as visibility (VIS) or RVR limits, taking into account all relevant factors for each heliport or landing location planned to be used and the helicopter characteristics. Where there is a specific need to see and avoid obstacles on departure and/or for a forced landing, additional conditions (e.g. ceiling) must be specified.

(ii) The commander shall not commence take-off unless the weather conditions at the heliport or landing location of departure are equal to or better than applicable minima for landing at that heliport unless a suitable take-off alternate heliport is available.

(iii) When the reported meteorological visibility (VIS) is below that required for take-off and RVR is not reported, a take-off may only be commenced if the commander can determine that the RVR/Visibility along the take-off area/runway is equal to or better than the required minimum.

(iv) When no reported meteorological visibility(VIS) or RVR is available, a take-off may only be commenced if the commander can determine that the RVR/Visibility along the take-off area/runway is equal to or better than the required minimum.

(2) *Visual reference.*

(i) The take-off minima must be selected to ensure sufficient guidance to control the helicopter in the event of both a rejected take-off in adverse circumstancesand a continued take-off after failure of the critical engine.

(ii) For night operations ground lighting must be available to illuminate the FATO/runway and any obstacles unless otherwise agreed by the BCAA.

(iii) For point-in-space (PinS) departures to an initial departure fix (IDF), the take-off minima should be selected to ensure sufficient guidance to see and avoid obstacles and return to the heliport if the flight cannot be continued visually to the IDF. This should require a VIS of 800 m. The ceiling should be 250 ft.

(3) *Required RVR/Visibility*

(i) For Performance Class 1 operations, the operator must establish an RVR and visibility respectively (RVR/VIS) as take-off minima in accordance with the following table 1

Table 1 - RVR/Visibility for take-off – Helicopter (without LVTO approval)

Onshore aerodromes with instrument flight rules (IFR) departure procedures	**RVR/VIS (m)*** **
No light and no markings (day only)	400 or the rejected take-off distance, whichever is the greater
No markings (night)	800
Runway edge/FATO light and centreline marking	400
Runway edge/FATO light, centreline marking and relevant RVR information	400
Offshore helideck *	
Two-pilot operations	400
Single-pilot operations	500

* Take-off path to be free from obstacle

** *The PinS departure to IDF, VIS should not be less than 800m and the ceiling should not*

Note 1: The commander must establish that the take-off flight path is freeof obstacles.

(ii) For Performance Class 2 operations onshore, the commander must operate to take-off minima of 800 m RVR/VIS and remain clear of cloud during the take- off maneuver until reaching Performance Class 1 capabilities.

(iii) For Performance Class 2 operations offshore, the commander must operate to minima not less than that for Class 1 and remain clear of cloud during the take- off manoeuvre until reaching Performance Class 1 capabilities. (See note 1 to Table 1 above.)

~~(iv) Table 5 below, for converting reported meteorological visibility to RVR, mustnot be used for calculating take-off minima.~~

(b) *Non-Precision approach*

~~(1) The decision height (DH) to be used for a non-precision approach (NPA) flown with the continuous descent final approach (CDFA) technique, approach procedure with vertical guidance (APV) or category (CAT) I operation should not be lower than the highest of:~~

~~(i) the minimum height to which the approach aid can be used without the required visual reference;~~

~~(ii) the obstacle clearance height (OCH) for the category of aircraft;~~

~~(iii) the published approach procedure DH where applicable;~~

~~(iv) the system minimum specified in Table 2; or~~

~~(v) the minimum DH specified in the aircraft flight manual (AFM) or equivalent document, if stated.~~

~~(2) The minimum descent height (MDH) for an NPA operation flown without the CDFA technique should not be lower than the highest of:~~

~~(i) the OCH for the category of aircraft;~~

~~(ii) the system minimum specified in Table 2; or~~

~~(iii) the minimum MDH specified in the AFM, if stated.~~

AMC4 CAT.OP.MPA.110 Aerodrome operating minima

DETERMINATION OF DH/MDH FOR INSTRUMENT APPROACH OPERATIONS — HELICOPTERS

(1) The DH or MDH to be used for a 3D or a 2D approach operation should not be lower than the highest of:

(1) the OCH for the category of aircraft;
(2) the published approach procedure DH or MDH where applicable;
(3) the system minima specified in Table 2;
(4) the minimum DH permitted for the runway/FATO specified in Table 3, if applicable; or
(5) the minimum DH specified in the AFM or equivalent document, if stated.

~~(iv) The operator must ensure that system minima for non-precision approach, which are based upon the use of ILS without glidepath (LLZ only), VOR, NDB, SRAand VDF are not lower than the MDH values given in Table 2 below.~~

Table 2 – System minima for non-precision approach aids

Facility	**Lowest DH/MDH (ft)**
ILS/MLS/GLS	200
GNSS/SBAS (LPV) *	200
Precision Approach Radar (PAR)	200
GNSS/SBAS (LP)	250
GNSS (LNAV)	250
GNSS/Baro-VNAV (LNAV/ VNAV)	250
Helicopter PinS Approach	250 **

LOC with or without DME	250
SRA (terminating at ½ NM)	250
SRA (terminating at 1 NM)	300
SRA (terminating at 2 NM or more)	350
VOR	300
VOR/DME	250
NDB	350
NDB/DME	300
VDF	350

***** For LPV, a DH of 200 ft may be used only if the published FAS datablock sets a vertical alert limit not exceeding 35 m. Otherwise, the DH should not be lower than 250 ft.

** For PinS approaches with instructions to 'proceed VFR' to an undefined or virtual destination, the DH or MDH should be with reference to the ground below the missed approach point (MAPt).

Table 3 - *Type of runway/FATO versus lowest DH/MDH — helicopters*

Type of runway/FATO	***lowest DH/MDH (ft)***
Precision approach (PA) runway, category I Non-precision approach (NPA) runway Non-instrument runway	200
Instrument FATO FATO	200 250

Table 3 does not apply to helicopter PinS approaches with instructions to 'proceed VFR'.

(3) *Visual Reference*. A pilot may not continue an approach below MDA/MDH unless at least one of the following visual references for the intended FATO/runway is distinctly visible and identifiable to the pilot:

(i) Elements of the approach light system;

(ii) The threshold;

(iii) The threshold markings;

(iv) The threshold lights;

(v) The threshold identification lights;

(vi) The visual glide slope indicator;

(vii) The touchdown zone or touchdown zone markings;

(viii) The touchdown zone lights;

(ix) FATO/Runway edge lights; or

(x) Other visual references accepted by the BCAA.

(4) *Required RVR*. (See AMC OPS 3.430(b)(4).)

(i) For non-precision approaches by helicopters operated in Performance Class 1 or2, the minima given in the following Table 3 shall apply.

~~(c) *Determination of RVR/CMV/VIS Minima for NPA, CAT 1 – Helicopter*~~

~~The RVR/CMV/VIS minima for NPA, APV and CAT I operations should be determined asfollows:~~

~~(1) For NPA operations operated in performance class 1 (PC1) or performance class 2 (PC2),the minima specified in Table 3 should apply:~~

~~(i) where the missed approach point is within ½ NM of the landing threshold, the approach minima specified for FALS may be used regardless of the length of approach lights available. However, FATO/runway edge lights, threshold lights, end lights and FATO/runway markings are still required;~~

~~(ii) for night operations, ground lights should be available to illuminate the FATO/runway and any obstacles; and~~

~~(iii) for single-pilot operations, the minimum RVR is 800 m or the minima in Table 3,whichever is higher.~~

~~(2) For CAT I operations operated in PC1 or PC2, the minima specified in Table 4 shouldapply:~~

~~(i) for night operations, ground light should be available to illuminate the FATO/runway and any obstacles;~~

~~(ii) for single-pilot operations, the minimum RVR/VIS should be calculated in accordance with the following additional criteria:~~

~~(a) an RVR of less than 800 m should not be used except when using a suitableautopilot coupled to an ILS, MLS or GLS, in which case normal minima apply; and~~

~~(b) the DH applied should not be less than 1.25 times the minimum use height forthe autopilot.~~

AMC6 CAT.OP.MPA.110

(c) DETERMINATION OF RVR OR VIS FOR INSTRUMENT APPROACH OPERATIONS — HELICOPTERS

The RVR/VIS minima for Type A instrument approach and Type B CAT I instrument approach operations should be determined as follows:

(1) For IFR operations, the RVR or VIS should not be less than the greatest of:

(1) the minimum RVR or VIS for the type of runway/FATO used according to Table 4;

(2) the minimum RVR determined according to the MDH or DH and class of lighting facility according to Table 4; or

(3) for PinS operations with instructions to 'proceed visually', the distance between the MAPt of the PinS and the FATO or its approach light system.

If the value determined in (1) is a VIS, then the result is a minimum VIS. In all other cases, the result is a minimum RVR.

(2) For PinS operations with instructions to 'proceed VFR', the VIS should be compatible with visual flight rules.

(3) For Type A instrument approaches where the MAPt is within ½ NM of the landing threshold, the approach minima specified for FALS may be used regardless of the length of the approach lights available. However, FATO/runway edge lights, threshold lights, end lights and FATO/runway markings are still required.

(4) An RVR of less than 800 m should not be used except when using a suitable autopilot coupled to an ILS, an MLS, a GLS or LPV, in which case normal minima apply.

(5) For night operations, ground lights should be available to illuminate the FATO/runway and any obstacles.

(6) The visual aids should comprise standard runway day markings, runway edge lights, threshold lights and runway end lights and approach lights as specified in Table 6.

(7) For night operations or for any operation where credit for runway and approach lights as defined in Table 14 is required, the lights should be on and serviceable except as defined in Table 17.

Table 4 - Type of runway/FATO versus minimum RVR — helicopters

Type of runway/FATO	**Minimum RVR or VIS**
PA runway, category I NPA runway Non-instrument runway	RVR 550 m
Instrument FATO FATO	RVR 550 m RVR/VIS 800 m

Table ~~3~~ 5 – Onshore Non-precision approach minima

~~Onshore Non-precision Approach Minima **, ***~~				
~~MDH (ft)*~~	~~Facilities/RVR~~			
	~~FALS~~	~~IALS~~	~~BALS~~	~~NALS~~
~~250-299 ft~~	~~600 m~~	~~800 m~~	~~1 000 m~~	~~1 000 m~~
~~300-449 ft~~	~~800 m~~	~~1 000 m~~	~~1 000 m~~	~~1 000 m~~
~~450 ft and above~~	~~1 000 m~~	~~1 000 m~~	~~1 000 m~~	~~1 000 m~~

~~*: The MDH refers to the initial calculation of MDH. When selecting the associated RVR, thereis no need to take account of a rounding up to the nearest 10 ft, which may be done for operational purposes, e.g. conversion to MDA.~~

~~**: The tables are only applicable to conventional approaches with a nominal descent slope of not greater than 4°. Greater descent slopes will usually require that visual glide slope guidance (e.g. precision approach path indicator (PAPI)) is also visible at the MDH.~~

~~***: FALS comprise FATO/runway markings, 720 m or more of high intensity/medium intensity (HI/MI) approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights to be on.~~

~~IALS comprise FATO/runway markings, 420 - 719 m of HI/MI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights to be on.~~

~~BALS comprise FATO/runway markings, <420 m of HI/MI approach lights, any length of low intensity (LI) approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights to be on.~~

~~NALS comprise FATO/runway markings, FATO/runway edge lights, threshold lights, FATO/runway end lights or no lights at all.~~

DH/MDH (ft)	**Facilities versus RVR (m)**			
	FALS	**IALS**	**BALS**	**NALS**
200	500	600	700	1 000
201 – 249	550	650	750	1 000
250 - 299	600*	700*	800*	1 000
300 and above	750*	800	900	1 000

***** Minima on 2D approach operations should be no lower than 800m.

~~(d) *Precision approach/On shore – Category I Minima*~~

~~**Table 4 – Onshore Precision Approach Minima – Category I**~~

~~Facility Vs RVR / CMV **, ***~~	
~~DH (ft) *~~	~~Facilities/RVR~~

	~~FALS~~	~~IALS~~	~~BALS~~	~~NALS~~
~~200 ft~~	~~500 m~~	~~600 m~~	~~700 m~~	~~1 000 m~~
~~201-250 ft~~	~~550 m~~	~~650 m~~	~~750 m~~	~~1 000 m~~
~~251-300 ft~~	~~600 m~~	~~700 m~~	~~800 m~~	~~1 000 m~~
~~301 ft & above~~	~~750 m~~	~~800 m~~	~~900 m~~	~~1 000 m~~

~~*: The DH refers to the initial calculation of DH. When selecting the associated RVR, there is no need to take account of a rounding up to the nearest 10 ft, which may be done for operational purposes, e.g. conversion to DA.~~

~~**: The table is applicable to conventional approaches with a glide slope up to and including 4°.~~

~~***: FALS comprise FATO/runway markings, 720 m or more of HI/MI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights to be on.~~

~~IALS comprise FATO/runway markings, 420 - 719 m of HI/MI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights to be on.~~

~~BALS comprise FATO/runway markings, <420 m of HI/MI approach lights, any length of LI approach lights, FATO/runway edge lights, threshold lights and FATO/runway end lights. Lights to be on.~~

~~NALS comprise FATO/runway markings, FATO/runway edge lights, threshold lights, FATO/runway end lights or no lights at all.~~

Table 6 – Approach Lighting Systems – Helicopters

Class of lighting facility	**Length, configuration and intensity of approach lights**
FALS	CAT I lighting system (HIALS ≥ 720 m) distance coded centre line, barrette centre line
IALS	Simple approach lighting system (HIALS 420–719 m) single source, barrette
BALS	Any other approach lighting system (HIALS, MALS or ALS 210–419 m)
NALS	Any other approach lighting system (HIALS, MALS or ALS < 210 m) or no approach lights

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(e) *Onshore circling*

(1) Circling is the term used to describe the visual phase of an instrument approach, to bring an aircraft into position for landing on a FATO/runway which is not suitably located for a straight in approach.

(2) For circling the specified MDH shall not be less than 250 ft, and the meteorological visibility shall not be less than 800 m.

Note: Visual manoeuvring (circling) with prescribed tracks is an accepted procedure within the meaning of this paragraph.

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(f) *Visual Approach*. The operator shall not use an RVR of less than 800 m for a visual approach.

~~(g) *Conversion of Reported Meteorological Visibility to RVR*~~

Ops to Check - Is this applicable to Helicopters?????

~~(1) A conversion from meteorological visibility to RVR/CMV should not be used:~~

~~(i) when reported RVR is available;~~

~~(ii) for calculating take-off minima; and~~

~~(iii) for any RVR minima less than 800 m.~~

~~(2) If the RVR is reported as being above the maximum value assessed by the aerodrome operator, e.g. 'RVR more than 1 500 m', it should not be considered as a reported value for (a)(1).~~

~~(3) When converting meteorological visibility to RVR in circumstances other than those in (a), the conversion factors specified in Table 5 should be used.~~

~~Table 5 – Conversion of visibility to RVR~~

~~**Lighting elements in operation**~~	~~**RVR = met. visibility multiplied by:**~~	
	~~Day~~	~~Night~~
~~Hi approach and runway lighting~~	~~1·5~~	~~2·0~~
~~Any type of lighting~~	~~1·0~~	~~1·5~~
~~No lighting~~	~~1·0~~	~~Not applicable~~

~~(i) *Airborne Radar Approach (ARA) for overwater operations* (See IEM to Appendix 1 to ANTR OPS 3.430, sub-paragraph (i)~~

(1) *General*

(i) The operator shall not conduct ARAs unless authorised by the BCAA.

(ii) Airborne Radar Approaches are only permitted to rigs or vessels under way when a multi-crew concept is used.

(iii) A commander shall not undertake an Airborne Radar Approach unless the radar can provide course guidance to ensure obstacle clearance.

(iv) Before commencing the final approach the commander shall ensure that a clear path exists on the radar screen for the final and missed approach segments. If lateral clearance from any obstacle will be less than 1.0 nm, the commander shall:

(A) Approach to a nearby target structure and thereafter proceed visually to the destination structure; or

(B) Make the approach from another direction leading to a circling manoeuvre.

(v) The Commander shall ensure that the cloud ceiling is sufficiently clear above the helideck to permit a safe landing.

(2) *Minimum Descent Height (MDH)*. Notwithstanding the minima at sub-paragraphs (i) and (ii) below, the MDH shall not be less than 50 ft above the elevation of the helideck.

(i) The MDH is determined from a radio altimeter. The MDH for an airborne radar approach shall not be lower than:

(A) 200 ft by day;

(B) 300 ft by night.

(ii) The MDH for an approach leading to a circling manoeuvre shall not be lowerthan:

(A) 300 ft by day;

(B) 500 ft by night.

(3) *Minimum descent altitude (MDA)*. An MDA may only be used if the radio altimeter is unserviceable. The MDA shall be a minimum of MDH +200 ft and shall be based on a calibrated barometer at the destination or on the lowest forecast QNH for the region.

(4) *Decision range*. The Decision Range shall not be less than 0·75 nm unless the operator has demonstrated to the BCAA that a lesser Decision Range can be used at an acceptable level of safety.

(5) *Visual reference*. No pilot may continue an approach beyond Decision Range or below MDH/MDA unless he is visual with the destination.

(6) *Single pilot operations*. The MDH/MDA for a single pilot ARA shall be 100 ft higher than that calculated using sub-paragraphs (2) and (3) above. The Decision Range shall not be less than 1·0 nm.

(7) For approaches to non-moving offshore locations, the maximum range discrepancy between the global navigation satellite system (GNSS) and the weather radar display should not be greater than 0.3 nm at any point between the final approach fix (FAF) at 4 nm from the offshore location and the offset initiation point (OIP) at 1.5 nm from the offshore location.

(8) For approaches to non-moving offshore locations, the maximum bearing discrepancy between the GNSS and the weather radar display should not be greater than 10° at the FAF at 4 nm from the offshore location.

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(h) *Effect on Landing Minima of Temporarily Failed or Downgraded Ground Equipment*

(1) General

These instructions are intended for use both pre-flight and in-flight. It is, however, not expected that the commander would consult such instructions after passing 1 000 ft above the aerodrome. If failures of ground aids are announced at such a late stage, the approach could be continued at the commander's discretion. If failures are announced before such a late stage in the approach, their effect on the approach should be considered as described in Table 6, and the approach may have to be abandoned.

(2) Conditions applicable to Table 7 ~~6~~ below:

(i) multiple failures of runway/FATO lights other than indicated in Table 9 should not be acceptable;

(ii) deficiencies of approach and runway/FATO lights are treated separately; and

(iii) failures other than ILS, MLS affect RVR only and not DH.

Table 7 ~~6~~ - Failed or downgraded equipment — effect on landing minima
Operations without a low visibility operations (LVO) approval

Failed or downgraded equipment	Effect on landing minima	
	~~CAT I~~ **TYPE B**	~~APV, NPA~~ **TYPE A**
~~ILS/MLS~~ Navaid stand-by transmitter	No effect	
Outer Marker	~~Not allowed except if replaced by height check at 1 000 ft~~ FOR CAT I: Not allowed except if the required height versus glide path can be checked using other means, e.g. DME fix	APV — not applicable NPA with FAF: no effect unless used as FAF If the FAF cannot be identified (e.g. no method available for timing of descent), non- precision operations cannot be conducted. FOR CAT I: Not allowed except if the required height versus glide path can be checked using other means, e.g. DME fix
Middle marker (ILS Only)	No effect	No effect unless used as MAPt
RVR Assessment Systems	No effect	
Approach lights	Minima as for NALS	
Approach lights except the last 210 m	Minima as for BALS	
Approach lights except the last 420 m	Minima as for IALS	
Standby power for approach lights	No effect	
Edge lights, threshold lights and runway end lights	Day: no effect; Night: not allowed	
Centreline lights	Aeroplanes: No effect if F/D, HUDLS or auto-land otherwise RVR 750 m Helicopters: No effect on CAT I and HELI SA CAT I approach operations	No effect but the minimum RVR should be 750m.
Centreline lights spacing increased to 30 m	No effect	

Touchdown zone lights	Aeroplanes: No effect if F/D, HUDLS or auto-land; otherwise RVR 750 m. Helicopters: No effect	No effect
Taxiway lighting system	No effect	

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(h) *VFR Operations with Other-Than-Complex Motor-Powered Aircraft*

For the establishment of VFR operation minima, the operator may apply the VFR operating minima specified in ANTR OPS 1.465. Where necessary, the operator may specify in the OM additional conditions for the applicability of such minima taking into account such factors as radio coverage, terrain, nature of sites for take-off and landing, flight conditions and ATS capacity.

Appendix 1 to ANTR OPS 3.440

Low Visibility Operations - General Operating Rules

~~(a) *General*. The following procedures apply to the introduction and approval of low visibility operations.~~

~~(b) *Airborne Systems Operational Demonstration*. The operator must comply with the requirements prescribed in sub-paragraph (c) below when introducing a helicopter type which is new to the BCAA into Category II or III service.~~

~~*Note: For helicopter types already used for Category II or III operations in another State, the in-service proving programme in paragraph (f) applies instead.*~~

~~(1) *Operational reliability*. The Category II and III success rate must not be less than that required by CS- AWO.~~

~~(2) *Criteria for a successful approach*. An approach is regarded as successful if:~~

~~(i) The criteria are as specified in CS- AWO or its equivalent;~~

~~(ii) No relevant helicopter system failure occurs.~~

~~(c) *Data Collection during Airborne System Demonstration*. General~~

~~(1) The operator must establish a reporting system to enable checks and periodic reviews to be made during the operational evaluation period before the operator is authorised to conduct Category II or III operations. The reporting system must cover all successful and unsuccessful approaches, with reasons for the latter, and include a record of system component failures. This reporting system must be based upon flight crew reports and automatic recordings as prescribed in paragraphs (d) and (e) below.~~

~~(2) The recordings of approaches may be made during normal line flights or during other flights performed by the operator.~~

~~(d) *Data Collection during Airborne System Demonstration – Operations with DH not less than 50 ft.*~~

~~(1) For operations with DH not less than 50 ft, data must be recorded and evaluated by the operator and evaluated by the BCAA when necessary.~~

~~(2) It is sufficient for the following data to be recorded by the flight crew:~~

~~(i) Heliport or landing location and runway used;~~

~~(ii) Weather conditions;~~

~~(iii) Time;~~

~~(iv) Reason for failure leading to an aborted approach;~~

~~(v) Adequacy of speed control;~~

~~(vi) Trim at time of automatic flight control system disengagement;~~

~~(vii) Compatibility of automatic flight control system, flight director and raw data;~~

~~(viii) An indication of the position of the helicopter relative to the ILS centreline when descending through 30 m (100 ft); and~~

~~(ix) Touchdown position.~~

~~(3) The number of approaches, as approved by the BCAA, made during the initial evaluation must be sufficient to demonstrate that the performance of the system in actual airline service is such that a 90% confidence and a 95% approach success will result.~~

~~(e) *Data Collection during Airborne System Demonstration – Operations with DH less than 50 ft or no DH*~~

~~(1) For operations with DH less than 50 ft or no DH, a flight data recorder, or other equipment giving the appropriate information, must be used in addition to the flight crew reports to confirm that the system performs as designed in actual airline service. The following data is required:~~

~~(i) Distribution of ILS deviations at 30 m (100 ft), at touchdown and, if appropriate, at disconnection of the roll-out control system and the maximum values of the deviations between those points; and~~

~~(ii) Sink rate at touchdown.~~

~~(2) Any landing irregularity must be fully investigated using all available data to determine its cause.~~

~~(f) *In-service proving*~~

~~*Note: The operator fulfilling the requirements of sub-paragraph (b) above will be deemed to have satisfied the in-service proving requirements contained in this paragraph.*~~

~~(1) The system must demonstrate reliability and performance in line operations consistent with the operational concepts. A sufficient number of successful landings, as determined by the BCAA, must be accomplished in line operations, including training flights, using the autoland and roll-out system installed in each helicopter type.~~

~~(2) The demonstration must be accomplished using a Category II or Category III ILS. However, if the operator chooses to do so, demonstrations may be made on other ILS facilities if sufficient data is recorded to determine the cause of unsatisfactory performance.~~

~~(3) If the operator has different variants of the same type of helicopter utilising the same basic flight control and display systems, or different basic flight control and display systems on the same type of helicopter, the operator shall show that the variantscomply with the basic system performance criteria, but the operator need not conducta full operational demonstration for each variant.~~

~~(4) Where the operator introduces a helicopter type which has already been approved by the BCAA of any State for Category II and/or III operations a reduced proving programme may be approved.~~

~~(g) *Continuous Monitoring*~~

~~(1) After obtaining the initial authorisation, the operations must be continuously monitored by the operator to detect any undesirable trends before they become hazardous. Flight crew reports may be used to achieve this.~~

~~(2) The following information must be retained for a period of 12 months:~~

~~(i) The total number of approaches, by helicopter type, where the airborne Category II or III equipment was utilised to make satisfactory, actual or practice, approaches to the applicable Category II or III minima; and~~

~~(ii) Reports of unsatisfactory approaches and/or automatic landings, by heliport or landing location and helicopter registration, in the following categories:~~

~~(A) Airborne equipment faults;~~

~~(B) Ground facility difficulties;~~

~~(C) Missed approaches because of ATC instructions; or~~

~~(D) Other reasons.~~

~~(3) The operator must establish a procedure to monitor the performance of the automatic landing system of each helicopter.~~

~~(h) *Transitional periods*~~

~~(1) *Operators with no previous Category II or III experience*~~

~~(i) The operator without previous Category II or III operational experience may be approved for Category II or IIIA operations, having gained a minimum experience of 6 months of Category I operations on the helicopter type.~~

~~(ii) On completing 6 months of Category II or IIIA operations on the helicopter type the operator may be approved for Category IIIB operations. When granting such an approval, the BCAA may impose higher minima than the lowest applicable for an additional period. The increase in minima will normally only refer to RVR and/or a restriction against operations with no decision height and must be selected such that they will not require any change of the operational procedures.~~

~~(2) *Operators with previous Category II or III experience*. The operator with previous Category II or III experience may obtain authorisation for a reduced transition period by application to the BCAA.~~

~~(i) *Maintenance of Category II, Category III and LVTO equipment*. Maintenance instructions for the on-board guidance systems must be established by the operator, in liaison with the manufacturer, and included in the operator' s helicopter maintenance programme prescribed in ANTR OPS 3.910 which must be approved by the BCAA.~~

AMC1 SPA.LVO.105(a)

I. AIRCRAFT CERTIFICATION FOR THE INTENDED OPERATIONS

(a) Aircraft used for LVTO in an RVR of less than 125 m should be equipped with a system certified for the purpose.

(b) Aircraft used for low-visibility approach operations should be equipped in accordance with the applicable airworthiness requirements and certified as follows:

(1) For CAT II operations, the aircraft should be certified for CAT II operations.

(2) For CAT III operations, the aircraft should be certified for CAT III operations.

(3) For SA CAT I, the aircraft should be certified for SA CAT I operations.

(4) For SA CAT II, the aircraft should be certified for CAT II operations and be equipped with HUD Landing System or fail-passive autoland or better.

(5) For EFVS operations, the aircraft should be equipped with a certified EFVS-A / EVS Approach or EFVS-L / EVS Landing.

GM1 SPA.LVO.105(a)

II. AIRCRAFT CERTIFICATION — EQUIPMENT ELIGIBLE FOR LOW VISIBILITY TAKE-OFF IN AN RVR LESS THAN 125 M

Systems that are used to qualify for take-off in an RVR less than 125 m typically allow the pilot to use the external visual cues as well as instrumented guidance to track the runway centre line. The kind of systems in use today include paravisual display (PVD) and HUD. It is expected that EFVS / EVSs will be certified for take-off guidance in the future. Where the PVD or HUD uses an ILS localiser signal as reference, the ILS sensitive area must be protected by the LVPs at the aerodrome.

AMC1 SPA.LVO.105(g)

III. SAFETY ASSESSMENT — MONITORING, DATA COLLECTION AND PERFORMANCE INDICATORS FOR APPROACH OPERATIONS

(a) The operator should monitor LVOs and operations with operational credits in order to validate the effectiveness of the applicable aircraft flight guidance systems, training, flight crew procedures, and aircraft maintenance programme, and to identify hazards.

(b) Data should be collected whenever an LVO or an operation with an operational credit is attempted regardless of whether the approach is abandoned, is unsatisfactory, or is concluded successfully. The data should include records of the following:

(1) occasions when it was not possible to commence an approach due to deficiencies or unserviceabilities of related airborne equipment;

(2) occasions when approaches were discontinued, including the reasons for discontinuing the approach and the height above the runway at which the approach was discontinued;

(3) occasions when system abnormalities required pilot intervention to ensure a continued approach or safe landing;

(4) landing performance, whether or not the aircraft landed satisfactorily within the desired touchdown area with acceptable lateral velocity or cross-track error. The approximate lateral and longitudinal position of the actual touchdown point in relation to the runway centre line and the runway threshold, respectively, should be recorded.

(c) Data about LVOs should be collected by means of the operator's flight data monitoring programme supplemented by other means including reports submitted by flight crew. Operators that do not have a flight data monitoring programme should use reports submitted by flight crew as the primary means of gathering data.

(d) Performance indicators should include the following:

(1) the rate of unsuccessful low-visibility approaches, i.e. the number of attempted approaches terminating in discontinued approaches, approaches where pilot intervention was required to ensure a continued approach or safe landing or where landing performance was unsatisfactory, compared to the number of low-visibility approaches attempted;

(2) measures of performance of the airborne equipment for low-visibility approaches or operations with operational credits;

(3) safety performance indicators related to other specific risks associated with LVOs.

(e) The following information should be retained for at least 5 years:

(1) the total number of low-visibility approaches or operations with an operational approval attempted or completed, including practice approaches, by aircraft type; and

(2) reports of unsatisfactory approaches and/or landings, by runway and aircraft registration, in the following categories:

(i) airborne equipment faults;

(ii) ground facility difficulties;

(iii) missed approaches because of air traffic control (ATC) instructions; or

(iv) other reasons.

AMC2 SPA.LVO.105(g)

IV. SAFETY ASSESSMENT PRIOR TO OBTAINING AN APPROVAL

(a) Prior to commencing LVOs or operations with operational credits, an operator should demonstrate to the competent authority that such operations will achieve an acceptable level of safety. This requires the operator to gather data from operations using the relevant systems and procedures and conduct safety assessments taking that data into account.

(b) The operator applying for the approval of low-visibility approach operations should determine the minimum number of approaches required to gather sufficient data to demonstrate an acceptable level of safety and the time period over which such data should be gathered.

(c) If an operator is applying for more than one LVO approval or an approval for operation with operational credits for a particular aircraft type, then data gathered from operations using the systems and procedures designed for one classification of operations or operation with operational credits may be used to support the application for another classification of operations or operation with operational credits provided the following elements are similar:

(1) type of technology, including:

(i) flight control/guidance system (FGS) and associated displays and controls;
(ii) flight management system (FMS) and level of integration with the FGS;
(iii) use of HUD or an equivalent display system; and
(iv) use of EFVS;

(2) operational procedures, including:

(i) alert height;
(ii) manual landing/automatic landing;
(iii) no DH operations;
(iv) use of HUD or an equivalent display system in hybrid operations; and
(v) use of EFVS / EVS to touchdown; and

(3) handling characteristics, including:

(i) manual landing from automatic or HUD or an equivalent display system guided approach;
(ii) manual missed approach procedure from automatic approach; and
(iii) automatic/manual roll-out.

(d) An operator holding an approval for low-visibility approach operations or operations with operational credits may use data gathered from approaches conducted using one aircraft type to support an application for approval for a different aircraft type or variants provided the following elements are similar:

(1) type of technology, including the following:

(i) FGS and associated displays and controls;

(ii) FMS and level of integration with the FGS;

(iii) use of HUD or an equivalent display system; and
(iv) use of EFVS / EVS ;

(2) operational procedures, including:

(i) alert height;
(ii) manual landing/automatic landing;
(iii) no DH operations;
(iv) use of HUD or an equivalent display system in hybrid operations; and
(v) use of EFVS / EVS to touchdown; and

(3) handling characteristics, including:

(i) manual landing from automatic or HUD or an equivalent display system guided approach;
(ii) manual missed approach procedure from automatic approach; and

(iii) automatic/manual roll-out.

GM1 SPA.LVO.105(g)

V. SPECIFIC APPROVAL CRITERIA — SUCCESSFUL APPROACH AND LANDING

(a) The purpose of this guidance is to provide operators with supplemental information regarding the criteria for a successful approach and landing.

(b) An approach may be considered to be successful if:

(1) from 500 ft to start of flare:

(i) speed is maintained within +/- 5 kt of the intended speed, disregarding rapid fluctuations due to turbulence;
(ii) no relevant system failure occurs; and

(2) from 300 ft to DH:

(i) no excess deviation occurs; and
(ii) no centralised warning gives a missed approach procedure command (if installed).

(c) A landing may be considered to be successful if:

(1) no relevant system failure occurs;
(2) no flare failure occurs;
(3) no de-crab failure occurs (if installed);
(4) longitudinal touchdown is beyond a point on the runway 150 m after the threshold and before the end of the touchdown zone (TDZ) (750 m from the threshold);
(5) lateral touchdown with the outboard landing gear is not outside the TDZ edge;

(6) sink rate is not excessive;

(7) bank angle does not exceed a bank angle limit; and
(8) no roll-out failure or deviation (if installed) occurs.

GM2 SPA.LVO.105(g)

VI. SAFETY PERFORMANCE MONITORING

(a) Data gathering for safety performance monitoring of LVOs and operations with operational credits will need to include sufficient information for the operator to identify hazards and assess the risks associated with LVOs and operations with operational credits.

(b) The following data relating to LVOs and operations with operational credits may be gathered via flight crew reports, flight data monitoring or other means, as appropriate:

(1) date and time;
(2) aircraft details (type and registration);
(3) airport, approach procedure, final approach and take-off area (FATO) and/or runway used;
(4) the type of LVO or operation with operational credits attempted or completed;
(5) weather conditions including wind, reported RVR and natural phenomena that restrict visibility;
(6) the reason for a discontinued approach (if applicable);
(7) details of any pilot intervention to ensure a continued approach or safe landing;
(8) adequacy of speed control;
(9) trim at time of automatic flight control system disengagement (if applicable);
(10) compatibility of automatic flight control system, flight director and raw data;
(11) an indication of the position of the aircraft relative to the centre line when descending through to 100 ft;
(12) touchdown position relative to the TDZ;

(13) an assessment of the sink rate, lateral velocity and bank angle at touchdown;
(14) the nature of any problems encountered by the crew in relation to operating procedures or training; and
(15) any human factors issues that arose in relation to the operation.

(c) Where data is gathered as part of the operator's flight data monitoring programme, procedures should be established to ensure that information that is only available directly from the flight crew or other sources (e.g. weather information) is captured.

(d) In order to assess the risks associated with LVOs and operations with operational credits, operators may consider hazards with the potential to result in the following unacceptable safety outcomes:

(1) loss of control in flight;
(2) runway overrun or excursion;
(3) controlled flight into terrain;
(4) runway incursion and ground collision; and
(5) airborne conflict.

(e) Operators' safety control processes will ensure that LVOs and operations with operational credits:

(1) meet the safety objectives and performance standards established in the operator's safety policy;
(2) achieve at least the same level of safety as operations other than LVOs and operations without operational credits; and
(3) have a continuously improving safety performance.

(f) Two methods to determine the rate of unsuccessful low-visibility approaches are described below:

(1) Fail/pass method (binary): the rate of unsuccessful low-visibility approaches determined in accordance with Paragraph V of this Appendix should not exceed 5 %. If the unsuccessful operations appear to occur on a given aircraft, aircraft series or runway, specific mitigation measures need to be established and a separate specific rate may need to be calculated and monitored.
Note: the term 'aircraft series' is explained below. Operators may choose to apply a lower rate than 5 %.

Explanations:
(a) *Aircraft make: The aircraft make is the name assigned to the aircraft by the aircraft manufacturer when each aircraft was produced. In most cases, the aircraft make is the common name of the aircraft manufacturer; for example, Airbus, Boeing, Embraer, etc.*
(b) Aircraft model: An aircraft model is an aircraft manufacturer's designation for an aircraft grouping with a similar design or style of structure. In EASA type certificate data sheet (TCDS), this means the aircraft type certificate; for example, A330, B777.
(c) Aircraft series: An aircraft series is an aircraft manufacturer's designation to identify differences within an aircraft model grouping. It provides a further specification to the aircraft type; for example, B777-232 where the series is the number 232. Some manufacturers define the so-called master series: An aircraft master series creates a grouping of similar aircraft series for analytical purposes and to identify aircraft series that share airworthiness properties. A master series contains aircraft series from within one aircraft model. For example, A320-100 and A320-200: the A320-100 master series only has one series (A320-

111), while the A320-200 master series has many series (211, 212, 214, 215, 216, 231, 232, 233).

(d) *Aircraft variant: a variant defines different sets of limiting structural masses (e.g. MTOW, MLW, MZFW, etc.) within a series. For example, A320-232-007 or the A330-243 RR engine's variant 052. Variants are not covered in the ICAO Cast taxonomy; however, they may be specified in the respective TCDS of the states of design.*

(2) Continuous method: this method may be selected by operators with a flight data monitoring programme. This methodology is more refined and allows identifying undesirable trends earlier and possibly before they become severe. This method applies an event monitoring methodology in which the deviations from the nominal performance are categorised according to their severity (severity index). For each event (criterion), a level of deviation may be defined as follows:

(i) Low ('green': the deviation is small and within the limits of nominal behaviour. No action is required.)

(ii) Medium ('yellow'): the deviation is above the criteria for low ('green') and below the criteria for high ('red'). No corrective action should be required based on an isolated occurrence; however, a corrective action should be taken if the situation does not improve, or a negative trend is identified. The monitoring should then focus on the particular runway or aircraft series or combination of those.

(iii) High ('red'): the deviation is undesirably high. Investigation and corrective action should be undertaken even based on an isolated occurrence. The threshold for level high ('red') may be based on the criteria of Paragraph V of this Appendix.

GM3 SPA.LVO.105(g)

VII. DATA GATHERING FOR SAFETY ASSESSMENT PRIOR TO OBTAINING AN APPROVAL

(a) General

The intention of the safety assessment is to validate the use and effectiveness of the applicable aircraft flight control and guidance systems, procedures, flight crew training and aircraft maintenance programme. The intention is not to repeat the statistical analysis required for certification of equipment, but rather to demonstrate that the various elements of the 'total system' for LVOs work together for a particular operator.

(b) Data gathering for safety assessment — LVTOs

(1) If the procedures used for LVTOs are not significantly different from those used for standard take-offs, it may be sufficient for operators to conduct only a small number of take-offs using the procedures established for LVTOs for the purpose of data gathering. The following could be considered as a minimum:

(i) For LVTOs in an RVR of 125 m or more if procedures are similar to those used for standard take-offs: 1 take-off;

(ii) For LVTOs in an RVR of less than 125 m or any other LVTOs using specific procedures: 10 take-offs.

(2) An operator holding an approval for LVTOs on one aircraft type and applying the approval for LVTOs on another type or variant may use data from LVTOs conducted on the first type if the following are similar:

(i) level of technology, including flight deck displays, HUD or an equivalent guidance system;
(ii) operational procedures; and
(iii) handling characteristics.

(c) Data gathering for safety assessment — approach operations with a DH below 200 ft

The data required for the safety assessment needs to be gathered from approaches conducted in a representative sample of expected operating conditions. The operator needs to take seasonal variations in operating conditions such as prevalent weather, planned destinations and operating bases, and ensure that the approaches used for data gathering are conducted over a sufficient period of time to be representative of the planned operation.

In order to ensure that the data is representative of planned operations, approaches are conducted at a variety of airports and runways. If more than 30 % of the approaches are conducted to the same runway, the operator may increase the number of approaches required and take measures to ensure that the data is not distorted.

The number of approaches used for data gathering will depend on the performance indicators and analysis methods used by the operator. The operator will need to demonstrate that the operation for which approval is sought will achieve an acceptable level of safety. The following figures may be considered a minimum for an operator without previous experience of low-visibility approach operations:

(1) for approval of operations with a DH of not less than 50 ft: 30 approaches;

(2) for approval of operations with a DH of less than 50 ft: 100 approaches.

Approaches conducted for the purpose of gathering data in order to conduct a safety assessment prior to obtaining an LVO approval may be conducted in line operations or any other flight where the operator’s procedures are used. Approaches may also be conducted in an FSTD if the operator is satisfied that this would be representative of the operation.

The data gathered from these approaches will only be representative if all required elements of the total system for LVOs are in place. These include not only operating procedures and airborne equipment, but also airport and ATC procedures and ground- or space-based navigation facilities. If the operator chooses to collect data from approaches conducted without all required elements in place, then the data analysis takes into account the effect of at least the following:

(1) air traffic services (ATS) factors including situations where a flight conducting an instrument approach is vectored too close to the FAF for satisfactory lateral and vertical path capture, lack of protection of ILS sensitive areas or ATS requests to discontinue the approach;

(2) misleading navigation signals such as ILS localiser irregularities caused by taxiing aircraft or aircraft overflying the localiser array;

(3) other specific factors that could affect the success of LVOs that are reported by the flight crew.

(d) Safety considerations for approaches used for data gathering

If an operator chooses to collect data from approaches conducted without all required elements of the total system for LVOs in place, then the operator takes actions to ensure an acceptable level of safety.

(e) Sharing of data: operators may use data from other operators or aircraft manufacturers to support the safety assessment required to demonstrate an acceptable level of safety. The operator applying for a specific approval would need to demonstrate that the data used was relevant to the proposed operation.

(f) It is expected that operators will have more than 6 months or at least 1 000 hours of total operational experience on the aircraft model before they can have sufficient data to set up meaningful performance indicators and establish whether planned LVOs would achieve an acceptable level of safety.

Appendix 1 to ANTR OPS 3.450

Low Visibility Operations - Training & Qualifications

AMC1 SPA.LVO.120(a),

AMC2,

AMC3,

GM1 SPA.LVO.120(b),

AMC1 to 7 SPA.LVO.120(b),

GM1 to 3 SPA.LVO.120(b) **add this GMs to IEM 1.450**

OR

We refer to ICAO Annex 6-I & DOC 9365

OPS to decide - It will depend on What training requirements are being followed by the Operator as of Now?

Low Visibility Operations – Training & Qualifications

I. ANTR OPS 1.450(a) - COMPETENCE OF THE FLIGHT CREW FOR THE INTENDED OPERATIONS — EXPERIENCE IN TYPE OR CLASS, OR AS PILOT-IN-COMMAND/COMMANDER

To ensure that the flight crew is competent to conduct the intended operations, the operator should assess the risks associated with the conduct of low-visibility approach operations by pilots new to the aircraft type or class and take the necessary mitigations. Where such mitigations include an increment to the visibility or RVR for LVOs, this should be stated in the operations manual.

II. ANTR OPS 1.450(a) - COMPETENCE OF THE FLIGHT CREW FOR THE INTENDED OPERATIONS — RECENT EXPERIENCE FOR EFVS / <u>EVS</u> **OPERATIONS**

To be considered competent to conduct EFVS / <u>EVS</u> operations:

(a) Pilots should complete a minimum of two approaches on each type of aircraft operated using the operator's procedures for EFVS / <u>EVS</u> operations during the validity period of each operator proficiency check or periodic demonstration of competence unless credits related to recent experience when operating more than one type are defined in the operational suitability data established by the operator in accordance with ANTR OPS 3 / ANTR FCL 1. When the operator is approved for both ~~EFVS-L and EFVS-A~~ EFVS / <u>EVS</u> , a minimum of one approach in each EFVS / <u>EVS</u> operation should be completed.

(b) If a flight crew member is authorised to operate as pilot flying and pilot monitoring during **EFVS / <u>EVS</u>** operations, the flight crew member should complete the required number of approaches in each operating capacity.

III. ANTR OPS 1.450(a) - COMPETENCE OF THE FLIGHT CREW FOR THE INTENDED OPERATIONS — RECENT EXPERIENCE FOR SA CAT I, CAT II, SA CAT II AND CAT III APPROACH OPERATIONS

To be considered competent:

(a) Pilots authorised to conduct low-visibility approach operations or operations with operational credits should complete at least two approaches using the operator's procedures for low-visibility approach operations or operations with operational credits, during the validity period of each operator proficiency check or periodic demonstration of competence, unless credits related to recent experience when operating more than one type are defined in the operational suitability data established by the operator in accordance with ANTR OPS 3 / ANTR FCL 1.

(b) If the operator is approved for more than one piece of aircraft equipment used (e.g. autoland, HUD, auto-coupled approach with manual landing, SVGS, etc.), pilots should complete at least one additional approach in the lowest approved RVR (either to go-around or landing) for each piece of aircraft equipment used during the validity period of each operator proficiency check or periodic demonstration of competence (e.g. two approaches CAT II with autoland and one CAT II with auto-coupled to below DH with manual landing, two CAT II autoland and one CAT II HUD to below DH with manual landing or vice versa) unless credits related to recent experience when operating more than one type are defined in the operational suitability data established by the operator in accordance with ANTR OPS 3 / ANTR FCL 1.

(c) Pilots authorised to conduct low-visibility approach operations or operations with operational credits using HUDLS or equivalent display systems to touchdown should complete two approaches (e.g. an operator approved for CAT II/III HUDLS will do two CAT III HUDLS; other examples would be two CAT III autoland and two CAT III HUDLS to touchdown, two SA CAT II autoland and two SA CAT II HUDLS, or when combining several LVOs and equipment, two CAT III autoland and one CAT II auto-coupled to below DH with manual landing and two CAT III HUDLS to touchdown) using the operator's procedures for low-visibility approach operations or operations with operational credits using HUDLS, during the validity period of each operator proficiency check or periodic demonstration of competence unless credits related to recent experience when operating more than one type are defined in the operational suitability data established by the operator in accordance with ANTR OPS 3 / ANTR FCL 1.

(d) If a flight crew member is authorised to operate as pilot flying and pilot monitoring, the flight crew member should complete the required number of approaches in each operating capacity.

IV. ANTR OPS 1.450(a) - COMPETENCE OF THE FLIGHT CREW FOR THE INTENDED OPERATIONS — EXPERIENCE IN TYPE OR CLASS, OR AS PILOT-IN-COMMAND/COMMANDER

As general guidance, the operator may use the following reference to assess the experience in type or class or as pilot-in-command/commander referred to in Para I of this Appendix 1 to ANTR OPS 3.450. ~~AMC1 SPA.LVO.120(a):~~

(a) Before commencing CAT II operations, the following guidance applies to pilots-in-command/commanders or pilots to whom conduct of the flight may be delegated, who are new to the aircraft type:

(1) 50 hours or 20 sectors on the type, including LIFUS; and

(2) 100 m should be added to the applicable CAT II RVR minima when the operation requires a CAT II manual landing to touchdown until:

(i) a total of 100 hours or 40 sectors, including LIFUS, has been achieved on the type; or

(ii) a total of 50 hours or 20 sectors, including LIFUS, has been achieved on the type where the flight crew member has been previously qualified for CAT II manual landing operations ~~with an EU operator~~;

(3) 100 m may be added to the applicable CAT II RVR minima when the operation requires the use of CAT II HUDLS to touchdown until:

(i) a total of 40 sectors, including LIFUS, has been achieved on the type; or

(ii) a total of 20 sectors, including LIFUS, has been achieved on the type where the flight crew member has been previously qualified for CAT II HUDLS to touchdown with an

EU operator.

The sector provision in point (a)(1) may always be applicable; the hours on type or class may not fulfil the provisions.

(b) Before commencing CAT III operations, the following additional provisions may apply to pilots-in-command/commanders or pilots to whom conduct of the flight may be delegated, who are new to the aircraft type:

(1) 50 hours or 20 sectors on the type, including LIFUS; and

(2) 100 m may be added to the applicable CAT II or CAT III RVR minima unless they have been previously qualified for CAT II or III operations with an EU operator, until a total of 100 hours or 40 sectors, including LIFUS, has been achieved on the type.

V. ANTR OPS 1.450(b) - INITIAL TRAINING FOR LVTO IN AN RVR LESS THAN 400 M

The operator should ensure that the flight crew members have completed the following training and checking prior to being authorised to conduct take-offs in an RVR below 400 m unless credits related to training and checking for previous experience in LVTOs on similar aircraft types are defined in the operational suitability data established by the operator in accordance with ANTR OPS 3 / ANTR FCL 1.:

(a) A ground training course including at least the following:

(1) characteristics of fog;

(2) effects of precipitation, ice accretion, low-level wind shear and turbulence;

(3) the effect of specific aircraft/system malfunctions;

(4) the use and limitations of RVR assessment systems;

(5) procedures to be followed and precautions to be taken with regard to surface movement during operations when the RVR is 400 m or less and any additional procedures required for take-off in conditions below 150 m;

(6) qualification requirements for pilots to obtain and retain approval to conduct LVOs; and

(7) the importance of correct seating and eye position.

(b) A course of FSTD/flight training covering system failures and engine failures resulting in continued as well as rejected take-offs. Such training should include at least:

(1) normal take-off in minimum approved RVR conditions;

(2) take-off in minimum approved RVR conditions with an engine failure:

(i) for aeroplanes, between V1 and V2 (take-off safety speed) or as soon as safety considerations permit;

(ii) for helicopters, at or after the take-off decision point (TDP); and

(3) take-off in minimum approved RVR conditions with an engine failure:

(i) for aeroplanes, before V1 resulting in a rejected take-off; and

(ii) for helicopters, before the TDP.

(c) The operator approved for LVTOs with an RVR below 150 m should ensure that the training specified in (b) is carried out in an FSTD. This training should include the use of any special procedures and equipment.

(d) The operator should ensure that a flight crew member has completed a check before conducting LVTOs in RVRs of less than 150 m. The check should require the execution of:

(1) at least one LVTO in the minimum approved visibility;

(2) at least one rejected take-off at minimum approved RVR in an aircraft or FSTD.

VI. ANTR OPS 1.450(b) - INITIAL TRAINING AND CHECKING FOR SA CAT I, CAT II, SA CAT II AND CAT III APPROACH OPERATIONS

Operators should ensure that flight crew members complete the following training and checking before being authorised to conduct Special Authorization (SA) CAT I, CAT II, SA CAT II and CAT III approach operations unless credits related to training and checking for previous experience on similar aircraft types are defined in the operational suitability data established by the operator in accordance with ANTR OPS 3 / ANTR FCL 1:

(a) For flight crew members who do not have previous experience of low-visibility approach operations requiring an approval under this Subpart with an EU operator:

(1) A course of ground training including at least the following:

(i) characteristics and limitations of different types of approach aids;

(ii) characteristics of the visual aids;

(iii) characteristics of fog;

(iv) operational capabilities and limitations of airborne systems to include symbology used on HUD/HUDLS or equivalent display systems, if appropriate;

(v) effects of precipitation, ice accretion, low level wind shear and turbulence;

(vi) the effect of specific aircraft/system malfunctions;

(vii) the use and limitations of RVR assessment systems;

(viii) principles of obstacle clearance requirements;

(ix) the recognition of failure of ground equipment or in satellite approaches, the loss of signal in space and the action to be taken in the event of such failures;

(x) procedures to be followed and precautions to be taken with regard to surface movement during operations when the RVR is 400 m or less and any additional procedures required for take-off in conditions below 150 m;

(xi) the significance of DHs based upon radio altimeters and the effect of terrain profile in the approach area on radio altimeter readings and on automatic approach/landing systems. This applies also to other devices capable of providing equivalent information;

(xii) the effect of the pre-threshold terrain and LSAA on airborne landing systems;

(xiii) the significance of alert height, if applicable, and action in the event of any failure above and below the alert height;

(xiv) qualification requirements for pilots to obtain and retain approval to conduct LVOs;

(xv) the importance of correct seating and eye position; and

(xvi) the significance of LVPs or equivalent procedures.

(2) A course of FSTD training and/or flight training in two phases as follows:

(i) Phase one (LVOs with aircraft and all equipment serviceable) — objectives

(A) understand the operation of equipment required for LVOs;

(B) understand the operating limitations resulting from airworthiness certification;

(C) practise the monitoring of automatic flight control systems and status annunciators;

(D) practise the use of HUD/HUDLS or equivalent display systems, where appropriate;

(E) understand the significance of alert height, if applicable;

(F) become familiar with the maximum lateral and vertical deviation permitted for different types of approach operation;

(G) become familiar with the visual references required at DH;

(H) master the manual aircraft handling relevant to low-visibility approach operations;

(I) practise coordination with other crew members; and
(J) become proficient at procedures for low-visibility approach operations with serviceable equipment.

(ii) Phase one of the training should include the following exercises:

(A) the required checks for satisfactory functioning of equipment, both on the ground and in flight;

(B) the use of HUD/HUDLS or equivalent display systems during all phases of flight, if applicable;

(C) approach using the appropriate flight guidance, autopilots, and control systems installed on the aircraft to the appropriate DH and transition to visual flight and landing;

(D) approach with all engines operating using the appropriate flight guidance, autopilots and control systems installed on the aircraft, including HUD/HUDLS or equivalent display systems, down to the appropriate DH followed by a missed approach, all without external visual reference;

(E) where appropriate, approaches using autopilot to provide automatic flare, hover, landing and roll-out; and

(F) where appropriate, approaches using approved HUD/HUDLS or equivalent display system to touchdown.

(iii) Phase two (low-visibility approach operations with aircraft and equipment failures and degradations) — objectives

(A) understand the effect of known aircraft unserviceability including use of the MEL;

(B) understand the effect of failed or downgraded equipment on aerodrome operating minima;

(C) understand the actions required in response to failures and changes in the status of automatic flight control/guidance systems including HUD/HUDLS or equivalent display systems;

(D) understand the actions required in response to failures above and below alert height, if applicable;

(E) practise abnormal operations and incapacitation procedures; and

(F) become proficient at dealing with failures and abnormal situations during low-visibility approach operations.

(iv) Phase two of the training should include the following exercises:

(A) approaches with engine failures at various stages of the approach;

(B) approaches with critical equipment failures, such as electrical systems, auto-flight systems, ground or airborne approach aids and status monitors;

(C) approaches where failures of auto-flight or flight guidance systems, including HUDLS or equivalent display systems, require either:

(a) reversion to manual control for landing or go-around; or

(b) reversion to manual control or a downgraded automatic mode control for go-around from the DH or below, including those which may result in contact with the runway.

This should include aircraft handling if, during a CAT III fail-passive approach, a fault causes autopilot to disconnect at or below the DH when the last reported RVR is 300 m or less;

(D) failures of systems that will result in excessive lateral or vertical deviation both above and below the DH in the minimum visual conditions for the operation;

(E) incapacitation procedures appropriate to low-visibility approach operations; and

(F) failures and procedures applicable to the specific aircraft type.

(v) FSTD training should include:

(A) for approaches flown using HUDLS or equivalent display systems, a minimum of eight approaches;

(B) otherwise, a minimum of six approaches.

(vi) For aircraft for which no FSTDs representing the specific aircraft are available, operators should ensure that the flight training phase specific to the visual scenarios of low-visibility approach operations is conducted in a specifically approved FSTD. Such training should include a minimum of four approaches. Thereafter, type-specific training should be conducted in the aircraft.

(3) A check requiring the completion of at least the following exercises in an aircraft or FSTD:

(i) Low-visibility approaches in simulated instrument flight conditions down to the applicable DH, using the flight guidance system. Standard procedures of crew coordination (task sharing, call-out procedures, mutual surveillance, information exchange and support) should be observed. For CAT III operations, the operator should use an FSTD approved for this purpose;

(ii) Go-around after approaches as indicated in (2) at any point between 500 ft above ground level (AGL) and on reaching the DH; and

(iii) Landing(s) with visual reference established at the DH following an instrument approach. Depending on the specific flight guidance system, an automatic landing should be performed.

(4) For operators for which LIFUS is required by Part-ORO, practice in approaches during LIFUS, as follows:

(i) For low-visibility approach operations using a manual landing:

(A) if a HUDLS or equivalent display system is used to touchdown, four landings, or if the training required by (a)(2) was conducted in an FSTD qualified for zero flight-time training (ZFTT), two landings;

(B) otherwise, three landings, or if the training required by (a)(2) was conducted in an FSTD qualified for ZFTT, one landing;

(ii) For low-visibility operations using autoland:

(A) if the training required by (a)(2) was conducted in an FSTD qualified for ZFTT, one landing, or none if the fight crew member successfully completed a type rating based on ZFTT;

(B) otherwise, two landings.

(b) For flight crew members who have previous experience of low-visibility approach operations requiring an approval ~~under this Subpart with an EU operator~~, when changing to an aircraft for which a new class or type rating is required, within the same operator:

(1) A course of ground training as specified in (a)(1), taking into account the flight crew member's existing knowledge of low-visibility approach operations.

(2) A course of FSTD and/or flight training, as specified in (a)(2) above. If the flight crew member's previous experience of low-visibility approach operations is on a type where the following were the same or similar:

(i) the technology used in the flight guidance and flight control system;

(ii) operating procedures;

(iii) handling characteristics; and

(iv) the use of HUD/HUDLS or equivalent display systems, then the flight crew member may complete an abbreviated course of FSTD and/or flight training.

(3) An abbreviated course should meet the objectives described in (a)(2), it does not need to include the number of approaches required by (a)(2)(v), but should include at least the following number of landings:

(i) if a HUDLS or an equivalent display system is utilised to touchdown, then four approaches including a landing at the lowest approved RVR and a go-around; or

(ii) otherwise, two approaches including a landing at the lowest approved RVR and a go-around.

(c) For flight crew members who have previous experience of low-visibility approach operations requiring an approval under this Subpart with an EU operator, when joining another operator:

(1) A course of ground training as specified in (a)(1), taking into account the flight crew member's existing knowledge of low-visibility approach operations.

(2) A course of FSTD and/or flight training as specified in (a)(2) above. If the flight crew member's previous experience of low-visibility approach operations is on the same aircraft type and variant, or on a different type or variant where the following were the same or similar:

(i) the technology used in the flight guidance and flight control system;

(ii) operating procedures;

(iii) handling characteristics; and

(iv) the use of HUD/HUDLS or equivalent display systems,
then the flight crew member may complete an abbreviated course of FSTD and/or flight training. Such an abbreviated course should meet the objectives described in (a)(2), it does not need to include the number of approaches required by (a)(2)(v), but should include at least the following number of landings:

(A) if a HUDLS or an equivalent display system is utilised to touchdown, then four approaches including a landing at the lowest approved RVR and a go-around; or

(B) otherwise, two approaches including a landing at the lowest approved RVR and a go-around.

(3) Practice in approaches during LIFUS as required by (a)(3) above unless the flight crew member's previous experience of low-visibility approach operations is on the same aircraft type and variant.

VII. ANTR OPS 1.450(b) - INITIAL TRAINING AND CHECKING FOR EFVS / EVS OPERATIONS

Operators should ensure that flight crew members complete the following training and checking before being authorised to conduct EFVS / EVS operations unless credits related to training and checking for previous experience on similar aircraft types are defined in the operational suitability data established by the operator in accordance with ANTR OPS 3 / ANTR FCL 1:

(a) For flight crew members who do not have previous experience of EFVS operations requiring an approval under this Subpart with an EU operator:

(1) A course of ground training including at least the following:

(i) characteristics and limitations of HUDs/HUDLSs or equivalent display systems including information presentation and symbology;

(ii) EFVS sensor performance, sensor limitations, scene interpretation, visual anomalies and other visual effects;

(iii) EFVS display, control, modes, features, symbology, annunciations and associated systems and components;

(iv) the interpretation of EFVS imagery;

(v) the interpretation of approach and runway lighting systems and display characteristics when using EFVS / EVS;

(vi) weather associated with low-visibility conditions and its effect on EFVS / EVS performance;

(vii) pre-flight planning and selection of suitable aerodromes and approach procedures;

(viii) principles of obstacle clearance requirements;

(ix) the use and limitations of RVR assessment systems;

(x) normal, abnormal and emergency procedures for EFVS / EVS operations;

(xi) the effect of specific aircraft/system malfunctions;

(xii) procedures to be followed and precautions to be taken with regard to surface movement during operations when the RVR is 400 m or less;

(xiii) for EFVS / EVS , the effect of the pre-threshold terrain and LSAA on airborne landing systems;

(xiv) human factors aspects of EFVS / EVS operations;

(xv) qualification requirements for pilots to obtain and retain approval for EFVS operations; and

(xvi) the significance of LVPs or equivalent procedures when operating below RVR 550 m.

(2) A course of FSTD training and/or flight training in two phases as follows:

(i) Phase one (EFVS / EVS operations with aircraft and all equipment serviceable) — objectives:

(A) understand the operation of equipment required for EFVS / EVS operations;

(B) understand operating limitations of the installed EFVS / EVS ;

(C) practise the use of HUD/HUDLS or equivalent display systems;

(D) practise the set-up and adjustment of EFVS / EVS equipment in different conditions (e.g. day and night);

(E) practise the monitoring of automatic flight control systems, EFVS / EVS information and status annunciators;

(F) practise the interpretation of EFVS / EVS imagery;

(G) become familiar with the features needed on the **EFVS / EVS** image to continue approach below the DH;

(H) practise the identification of visual references using natural vision while using EFVS / EVS equipment;

(I) master the manual aircraft handling relevant to EFVS / EVS operations including, where appropriate, the use of the flare cue and guidance for landing;

(J) practise coordination with other crew members; and

(K) become proficient at procedures for EFVS / EVS operations.

(ii) Phase one of the training should include the following exercises:

(A) the required checks for satisfactory functioning of equipment, both on the ground and in flight;

(B) the use of HUD/HUDLS or equivalent display systems during all phases of flight;

(C) approach using the EFVS / EVS installed on the aircraft to the appropriate DH and transition to visual flight and landing;

(D) approach with all engines operating using the EFVS / EVS, down to the appropriate DH followed by a missed approach, all without external visual reference;

(E) where appropriate, approaches using approved EFVS / EVS to touchdown.

(iii) Phase two (EFVS / EVS operations with aircraft and equipment failures and degradations) — objectives:

(A) understand the effect of known aircraft unserviceabilities including use of the MEL;

(B) understand the effect of failed or downgraded equipment on aerodrome operating minima;

(C) understand the actions required in response to failures and changes in the status of the EFVS / EVS including HUD/HUDLS or equivalent display systems;

(D) understand the actions required in response to failures above and below the DH;

(E) practise abnormal operations and incapacitation procedures; and

(F) become proficient at dealing with failures and abnormal situations during EFVS / EVS operations.

(iv) Phase two of the training should include the following exercises:

(A) approaches with engine failures at various stages of the approach;

(B) approaches with failures of the EFVS / EVS at various stages of the approach, including failures between the DH and the height below which an approach should not be continued if natural visual reference is not acquired, requiring either:

(a) reversion to head-down displays to control missed approach; or

(b) reversion to flight with no, or downgraded, guidance to control missed approaches from the DH or below, including those which may result in a touchdown on the runway;

(C) incapacitation procedures appropriate to EFVS / EVS operations; and

(D) failures and procedures applicable to the specific EFVS / EVS installation and aircraft type.

(v) FSTD training should include a minimum of eight approaches.

(vi) If a flight crew member is to be authorised to operate as pilot flying and pilot monitoring during EFVS / EVS operations, then the flight crew member should complete the required FSTD training for each operating capacity.

(3) For operators for which LIFUS is required by Part-ORO, practice in approaches during LIFUS, as follows:

(i) if EFVS / EVS is used to touchdown, four landings; or

(ii) otherwise, three landings.

(b) For flight crew members who have previous experience of EFVS / EVS operations requiring an approval under this Subpart with an EU operator, when changing to an aircraft for which a new class or type rating is required, with the same operator:

(1) A course of ground training as specified in (a)(1), taking into account the flight crew member’s existing knowledge of low-visibility approach operations.

(2) The course of FSTD and/or flight training required by (a)(2) above. If the flight crew member’s previous experience of low-visibility approach operations is on a type where the following were the same or similar:

(i) the technology used in the EFVS / EVS sensor, flight guidance and flight control system;

(ii) operating procedures; and

(iii) handling characteristics,

then the flight crew member may complete an abbreviated course of FSTD and/or flight training. Such an abbreviated course should meet the objectives described in (a)(2), it does not need to include the number of approaches required by (a)(2)(v), but should include at least the following number of landings:

(i) for EFVS / EVS to touchdown, four approaches including a landing at the lowest approved RVR and a go-around, or

(ii) otherwise, two approaches including a landing at the lowest approved RVR and a go-around.

(c) For flight crew members who have previous experience of EFVS / EVS operations requiring an approval under this Subpart with an EU operator, when joining another operator:

(1) A course of ground training as specified in (a)(1), taking into account the flight crew member's existing knowledge of low-visibility approach operations.

(2) The course of FSTD and/or flight training required by (a)(2) above. If the flight crew member's previous experience of EFVS operations is on the same aircraft type and variant with the same EFVS or on a different type or different EFVS / EVS where the following were the same or similar:

(i) the technology used in the EFVS sensor, flight guidance and flight control system;

(ii) operating procedures; and

(iii) handling characteristics,

then the flight crew member may complete an abbreviated course of FSTD and/or flight training.

(3) Such an abbreviated course should meet the objectives described in (a)(2), it does not need to include the number of approaches required by (a)(2)(v), but should include at least the following number of landings:

(i) for EFVS / EVS to touchdown, four approaches including a landing at the lowest approved RVR and a go-around, or

(ii) otherwise, two approaches including a landing at the lowest approved RVR and a go-around.

(4) Practice in approaches during LIFUS as required by (a)(3) above unless the flight crew member's previous experience of low-visibility approach operations is on the same aircraft type and variant.

VIII. ANTR OPS 1.450(b) - RECURRENT CHECKING FOR LVTO, SA CAT I, CAT II, SA CAT II AND CAT III APPROACH OPERATIONS

(a) The operator should ensure that the pilots' competence to perform LVOs for which they are authorised is checked by completing at least the following exercises:

(1) One or more low-visibility rejected take-off at minimum approved RVR at least once over the period between two operator proficiency checks or once at every periodic demonstration of competence or, for an ATQP operator, at each required operator proficiency check or alternatively at each required LOE (i.e. approximately one or more RTO per year).

(2) Pilots authorised for LVTO operations in an RVR of less than 150 m should conduct at least one LVTO in the minimum approved visibility at each required operator proficiency check or periodic demonstration of competence (i.e approximately one or more RTO every semester).

(3) One or more low-visibility approaches in simulated instrument flight conditions down to a point between 500 ft AGL and the threshold (e.g. applicable DH), followed by go-around, at each required operator proficiency check or periodic demonstration of competence; and

(4) One or more low-visibility approach and landings with visual reference established at the DH at each required operator proficiency check or periodic demonstration of competence.

(b) Pilots authorised to conduct CAT III operations on aircraft with a fail-passive autoland system, or HUDLS or equivalent, should complete a missed approach at least once over the period of three consecutive operator proficiency checks or demonstrations of competence as the result of an equipment failure at or below the DH when the last reported RVR was less than 300 m. For ATQP operators, pilots authorised to conduct CAT III operations on aircraft with a fail-passive autoland system, or HUDLS or equivalent, should complete a missed approach at least once every two OPCs or LOE (a period of about 2 years).

(c) CAT III approach operations should be conducted in an FSTD. Other exercises may be conducted in an FSTD or aircraft.

IX. ANTR OPS 1.450(b) - DIFFERENCES TRAINING FOR LVTO, Special Authorization (SA) CAT I, CAT II, SA CAT II AND CAT III APPROACH OPERATIONS

(a) The operator should ensure that the flight crew members are provided with differences training or familiarisation whenever they are required to conduct low-visibility approach operations or operations with operational credits requiring an approval under this Subpart for which they are not already authorised, or whenever there is a change to any of the following:

(1) the technology used in the flight guidance and flight control system;

(2) the operating procedures including:

(i) fail-passive/fail-operational;

(ii) alert height;

(iii) manual landing or automatic landing;

(iv) operations with DH or no DH operations;

(3) the handling characteristics;

(4) the use of HUD/HUDLS or equivalent display systems;

(5) the use of EFVS.

(b) The differences training should:

(1) meet the objectives of the appropriate initial training course;

(2) take into account the flight crew members' previous experience; and

(3) take into account the operational suitability data established by the operator in accordance with ANTR OPS 3 / ANTR FCL 1.

X. ANTR OPS 1.450(b) - RECURRENT CHECKING FOR EFVS OPERATIONS

(a) The operator should ensure that the pilots' competence to perform EFVS / EVS operations is checked at each required demonstration of competence or operator proficiency check by performing at least two approaches of which one should be flown without natural vision, to the height below which an approach should not be continued if natural visual reference is not acquired.

(b) If a flight crew member is authorised to operate as pilot flying and pilot monitoring during EFVS operations, then the flight crew member should complete the required number of approaches in each operating capacity.

XI. ANTR OPS 1.450(b) - DIFFERENCES TRAINING FOR EFVS OPERATIONS

(a) The operator should ensure that the flight crew members authorised to conduct EFVS operations are provided with differences training or familiarisation whenever there is a change to any of the following:

(1) the technology used in the EFVS sensor, flight guidance and flight control system;

(2) the operating procedures;

(3) the handling characteristics.

(b) The differences training should:

(1) meet the objectives of the appropriate initial training course;

(2) take into account the flight crew members' previous experience; and

(3) take into account the operational suitability data established by the operator in accordance with ANTR OPS 3.

~~(a) *General*. The operator must ensure that flight crew member training programmes for Low Visibility Operations include structured courses of ground, flight simulator and/or flight training. The operator may abbreviate the course content as prescribed by sub-paragraphs (2) and (3) below provided the content of the abbreviated course is acceptable to the BCAA.~~

~~(1) Flight crew members with no Category II or Category III experience must complete the full training programme prescribed in sub-paragraphs (b), (c) and (d) below.~~

~~(2) Flight crew members with Category II or Category III experience with another acceptable operator may undertake an abbreviated ground training course.~~

~~(3) Flight crew members with Category II or Category III experience with the operator may undertake an abbreviated ground, flight simulator and/or flight training course. The abbreviated course is to include at least the requirements of sub-paragraphs (d)(1), (d)(2)(i) or (d)(2)(ii) as appropriate and (d)(3)(i).~~

~~(b) *Ground Training*. The operator must ensure that the initial ground training course for Low Visibility Operations covers at least:~~

~~(1) The characteristics and limitations of the ILS and/or MLS;~~

~~(2) The characteristics of the visual aids;~~

~~(3) The characteristics of fog;~~

~~(4) The operational capabilities and limitations of the particular airborne system;~~

~~(5) The effects of precipitation, ice accretion, low level wind shear and turbulence;~~

~~(6) The effect of specific helicopter malfunctions;~~

~~(7) The use and limitations of RVR assessment systems;~~

~~(8) The principles of obstacle clearance requirements;~~

~~(9) Recognition of and action to be taken in the event of failure of ground equipment;~~

~~(10) The procedures and precautions to be followed with regard to surface movement during operations when the RVR is 400 m or less and any additional procedures required for take-off in conditions below 150 m;~~

~~(11) The significance of decision heights based upon radio altimeters and the effect of terrain profile in the approach area on radio altimeter readings and on the automatic approach/landing systems;~~

~~(12) The importance and significance of Alert Height if applicable and the action in the event of any failure above and below the Alert Height;~~

~~(13) The qualification requirements for pilots to obtain and retain approval to conduct Low Visibility Take-offs and Category II or III operations; and~~

~~(14) The importance of correct seating and eye position.~~

~~(c) *Flight Simulator training and/or flight training*~~

~~(1) The operator must ensure that flight simulator and/or flight training for Low Visibility Operations includes:~~

~~(i) Checks of satisfactory functioning of equipment, both on the ground and in flight;~~

~~(ii) Effect on minima caused by changes in the status of ground installations;~~

~~(iii) Monitoring of automatic flight control systems and autoland status annunciators with emphasis on the action to be taken in the event of failures of such systems;~~

~~(iv) Actions to be taken in the event of failures such as engines, electrical systems, hydraulics or flight control systems;~~

~~(v) The effect of known unserviceabilities and use of minimum equipment lists;~~

~~(vi) Operating limitations resulting from airworthiness certification;~~

~~(vii) Guidance on the visual cues required at decision height together with information on maximum deviation allowed from glidepath or localiser; and~~

~~(viii) The importance and significance of Alert Height if applicable and the action in the event of any failure above and below the Alert Height.~~

~~(2) The operator must ensure that each flight crew member is trained to carry out his duties and instructed on the coordination required with other crew members. Maximum use should be made of suitably equipped flight simulators for this purpose.~~

~~(3) Training must be divided into phases covering normal operation with no helicopter or equipment failures but including all weather conditions which may be encounteredand detailed scenarios of helicopter and equipment failure which could affect Category II or III operations. If the helicopter system involves the use of hybrid or other special systems (such as head up displays or enhanced vision equipment) then flight crew members must practise the use of these systems in normal and abnormal modes during the flight simulator phase of training.~~

~~(4) Incapacitation procedures appropriate to Low Visibility Take-offs and Category II and III operations shall be practised.~~

~~(5) For helicopters with no type specific flight simulator, operators must ensure that the flight training phase specific to the visual scenarios of Category II operations is conducted in a flight simulator approved for that purpose by the BCAA. Such training must include a minimum of 4 approaches. The training and procedures that are type specific shall be practised in the helicopter.~~

~~(6) Category II and III training shall include at least the following exercises:~~

~~(i) Approach using the appropriate flight guidance, autopilots and control systems installed in the helicopter, to the appropriate decision height and to include transition to visual flight and landing;~~

~~(ii) Approach with all engines operating using the appropriate flight guidance systems, autopilots and control systems installed in the helicopter down to the appropriate decision height followed by missed approach; all without external visual reference;~~

~~(iii) Where appropriate, approaches utilising automatic flight systems to provide automatic flare, hover, landing and roll-out; and~~

~~(iv) Normal operation of the applicable system both with and without acquisition of visual cues at decision height.~~

~~(7) Subsequent phases of training must include at least:~~

~~(i) Approaches with engine failure at various stages on the approach;~~

~~(ii) Approaches with critical equipment failures (e.g. electrical systems, autoflight systems, ground and/or airborne ILS/MLS systems and status monitors);~~

~~(iii) Approaches where failures of autoflight equipment at low level require either;~~

~~(A) Reversion to manual flight to control flare, hover, landing and roll out or missed approach; or~~

~~(B) Reversion to manual flight or a downgraded automatic mode to control missed approaches from, at or below decision height including those which may result in a touchdown on the runway;~~

~~(iv) Failures of the systems which will result in excessive localiser and/or glideslope deviation, both above and below decision height, in the minimum visual conditions authorised for the operation. In addition, a continuation to a manual landing must be practised if a head-up display forms a downgraded mode of the automatic system or the head-up display forms the only flare mode; and~~

~~(v) Failures and procedures specific to helicopter type or variant.~~

~~(8) The training programme must provide practice in handling faults which require a reversion to higher minima.~~

~~(9) The training programme must include the handling of the helicopter when, during a fail passive Category III approach, the fault causes the autopilot to disconnect at or below decision height when the last reported RVR is 300 m or less.~~

~~(10) Where take-offs are conducted in RVRs of 400 m and below, training must be established to cover systems failures and engine failure resulting in continued as well as rejected take-offs.~~

~~(d) *Conversion Training Requirements to conduct Low Visibility Take-off and Category II and III Operations*. The operator shall ensure that each flight crew member completes the following Low Visibility Procedures training if converting to a new type or variant of helicopter in which Low Visibility Take-off and Category II and III Operations will be conducted. The flight crew member experience requirements to undertake an abbreviated course are prescribed in sub-paragraphs (a)(2) and (a)(3), above;~~

~~(1) *Ground Training*. The appropriate requirements prescribed in sub-paragraph (b) above, taking into account the flight crew member' s Category II and Category III training and experience.~~

~~(2) *Simulator Training and/or Flight training.*~~

~~(i) A minimum of 8 approaches and/or landings in a flight simulator approved for the purpose.~~

~~(ii) Where no type-specific flight simulator is available, a minimum of 3 approaches including at least 1 go-around is required on the helicopter.~~

~~(iii) Appropriate additional training if any special equipment is required such as head-up displays or enhanced vision equipment.~~

~~(3) *Flight Crew Qualification*. The flight crew qualification requirements are specific to the operator and the type of helicopter operated.~~

~~(i) The operator must ensure that each flight crew member completes a check before conducting Category II or III operations.~~

~~(ii) The check prescribed in sub-paragraph (i) above may be replaced by successful completion of the flight simulator and/or flight training prescribed in sub- paragraph (d)(2) above.~~

~~(4) *Line Flying under Supervision*. The operator must ensure that each flight crew member undergoes the following line flying under supervision:~~

~~(i) For Category II when a manual landing is required, a minimum of 3 landings from autopilot disconnect;~~

~~(ii) For Category III, a minimum of 3 autolands except that only 1 autoland is required when the training required in sub-paragraph (d)(2) above has been carried out in a full flight simulator usable for zero flight time training.~~

~~(e) *Type and command experience*. The following additional requirements are applicable to commanders who are new to the helicopter type:~~

~~(1) 50 hours or 20 sectors as pilot-in-command on the type before performing any Category II or Category III operation; and~~

~~(2) 100 hours or 40 sectors as pilot-in-command on the type. 100 m must be added to the applicable Category II or Category III RVR minima unless he has been previously qualified for Category II or III operations with an acceptable operator.~~

~~(3) The BCAA may authorise a reduction in the above command experience requirements for flight crew members who have Category II or Category III command experience.~~

~~(f) *Low Visibility Take-Off with RVR less than 150 m*~~

~~(1) The operator must ensure that prior to authorisation to conduct take-offs in RVRsbelow 150 m the following training is carried out:~~

~~(i) Normal take-off in minimum authorised RVR conditions;~~

~~(ii) Take-off in minimum authorised RVR conditions with an engine failure at or after TDP; and~~

~~(iii) Take-off in minimum authorised RVR conditions with an engine failure before the TDP.~~

~~(2) The operator must ensure that the training required by sub-paragraph (1) above is carried out in an approved flight simulator. This training must include the use of any special procedures and equipment. Where no approved flight simulator exists, the BCAA may approve such training in a helicopter without the requirement for minimum RVR conditions. (See Appendix 1 to ANTR OPS 3.965.)~~

~~(3) The operator must ensure that a flight crew member has completed a check before conducting low visibility take-offs in RVRs of less than 150 m if applicable. The check may only be replaced by successful completion of the flight simulator and/or flight training prescribed in sub-paragraph (f)(1) on initial conversion to a helicopter type.~~

~~(g) *Recurrent Training and Checking – Low Visibility Operations*~~

~~(1) The operator must ensure that, in conjunction with the normal recurrent training and operator proficiency checks, a pilot' s knowledge and ability to perform the tasks associated with the particular category of operation, including LVTO, for which he is authorised is checked. The required number of approaches to be conducted during such recurrent training is to be a minimum of two, one of which is to be a missed approach and at least one low visibility take off to the lowest applicable minima. The period of validity for this check is 6 months including the remainder of the month of issue.~~

~~(2) For Category III operations the operator must use a flight simulator approved for Category III training.~~

~~(3) The operator must ensure that, for Category III operations on helicopters with a fail passive flight control system, a missed approach is completed at least once every 18 months as the result of an autopilot failure at or below decision height when the last reported RVR was 300 m or less.~~

~~(4) The BCAA may authorise recurrent training for Category II operations in a helicopter type where no approved flight simulator is available.~~

~~(h) *LVTO and Category II/III Recency Requirements*~~

~~(1) The operator must ensure that, in order for pilots to maintain a Category II and Category III qualification, they have conducted a minimum of 3 approaches and landings using approved Category II/III procedures during the previous six month period, at least one of which must be conducted in the helicopter.~~

~~(2) Recency for LVTO is maintained by retaining the Category II or III qualification prescribed in sub-paragraph (h)(1) above.~~

~~(3) The operator may not substitute this recency requirement for recurrent training.~~

Appendix 1 to ANTR OPS 3.455
Low Visibility Operations- Operating procedures

~~(a) *General*. Low Visibility Operations include:~~

~~(1) Manual take-off (with or without electronic guidance systems);~~

~~(2) Auto-coupled approach to below DH, with manual flare, hover, landing and roll-out;~~

~~(3) Auto-coupled approach followed by auto-flare, hover, autolanding and manual roll-out; and~~

~~(4) Auto-coupled approach followed by auto-flare, hover, autolanding and auto-roll-out, when the applicable RVR is less than 400 m.~~

~~*Note 1: A hybrid system may be used with any of these modes of operations.*~~

~~*Note 2: Other forms of guidance systems or displays may be certificated and approved.*~~

~~(b) *Procedures and Operating Instructions*~~

~~(1) The precise nature and scope of procedures and instructions given depend upon the airborne equipment used and the flight deck procedures followed. The operator must clearly define flight crew member duties during take-off, approach, flare, hover, roll-out and missed approach in the Operations Manual. Particular emphasis must be placed on flight crew responsibilities during transition from non-visual conditions to visual conditions, and on the procedures to be used in deteriorating visibility or when failures occur. Special attention must be paid to the distribution of flight deck dutiesso as to ensure that the workload of the pilot making the decision to land or execute a missed approach enables him to devote himself to supervision and the decision making process.~~

~~(2) The operator must specify the detailed operating procedures and instructions in the Operations Manual. The instructions must be compatible with the limitations and mandatory procedures contained in the Helicopter Flight Manual and cover the following items in particular:~~

~~(i) Checks for the satisfactory functioning of the helicopter equipment, both before departure and in flight;~~

~~(ii) Effect on minima caused by changes in the status of the ground installations and airborne equipment;~~

~~(iii) Procedures for the take-off, approach, flare, hover, landing, roll-out and missed approach;~~

~~(iv) Procedures to be followed in the event of failures, warnings and other non-normal situations;~~

~~(v) The minimum visual reference required;~~

~~(vi) The importance of correct seating and eye position;~~

~~(vii) Action which may be necessary arising from a deterioration of the visual reference;~~

~~(viii) Allocation of crew duties in the carrying out of the procedures according to sub-paragraphs (i) to (iv) and (vi) above, to allow the Commander to devote himself mainly to supervision and decision making;~~

~~(ix) The requirement for all height calls below 200 ft to be based on the radio altimeter and for one pilot to continue to monitor the helicopter instruments until the landing is completed;~~

~~(x) The requirement for the Localiser Sensitive Area to be protected;~~

~~(xi) The use of information relating to wind velocity, windshear, turbulence, runway contamination and use of multiple RVR assessments;~~

~~(xii) Procedures to be used for practice approaches and landing on runways at which the full Category II or Category III heliport or landing location procedures are not in force;~~

~~(xiii) Operating limitations resulting from airworthiness certification; and~~

(xiv) ~~Information on the maximum deviation allowed from the ILS glide path and/or localiser~~.

(EASA AMC1 SPA.LVO.105(c) or alternate from A-6-I or DOC 9365, Ch. 4.4)

I. OPERATING PROCEDURES FOR LVOs (AMC1 SPA.LVO.105(c))

Prior to commencing an LVO, the pilot-in-command/commander should be satisfied that:

(a) the status of visual and non-visual facilities is as required;

(b) if LVPs are required for such operations, LVPs are in effect; and

(c) the flight crew members are appropriately qualified.

II. OPERATING PROCEDURES — GENERAL (AMC2 SPA.LVO.105(c))

(a) Operating procedures should be established for all types of LVOs and operations with operational credits for which an operator is seeking approval. The operating procedures should:

(1) be consistent with the AFM;

(2) be appropriate to the technology and equipment to be used;

(3) specify the duties and responsibilities of each flight crew member in each relevant phase of flight;

(4) ensure that flight crew workload is managed to facilitate effective decision-making and monitoring of the aircraft; and

(5) minimise, as much as practical, the deviation from normal procedures used for routine operations (non-LVOs).

(b) Operating procedures should include:

(1) the required checks for the satisfactory functioning of the aircraft equipment, both before departure and in flight;

(2) the correct seating and eye position;

(3) determination of aerodrome operating minima;

(4) the increment to be added to minima for use by pilots-in-command/commanders who are new to the aircraft type, if applicable;

(5) the effect on aerodrome operating minima of temporarily failed or downgraded ground equipment;

(6) the effect on aerodrome operating minima of the failure or change of the status of any aircraft systems;

(7) when the LVPs at the aerodrome are required. LVPs are required:

(i) for low-visibility flight approach operations;
(ii) for LVTOs with RVR less than 400 m.

If an operator selects an aerodrome with equivalent procedures, where the term ‘LVPs’ is not used (e.g. regional procedures), the operator should verify that suitable procedures are established to ensure an equivalent level of safety to that achieved at approved aerodromes. This situation should be clearly noted in the operations manual or procedures manual, including guidance to the flight crew on how to determine that the suitable procedures are in effect at the time of an actual operation. Note: the AFM may state that some elements of LVPs are not required and therefore the equivalent level of safety may be established on that basis;

(8) a requirement for an ‘approaching minima’ call-out to prevent inadvertent descent below the DA/H;

(9) the requirement for height call-outs below 200 ft to be based on the use of a radio altimeter or other device capable of providing equivalent performance, if applicable;

(10) the required visual references;

(11) the action to be taken in the event of loss of the required visual references; and

(12) the maximum allowable flight path deviations and action to be taken in the event that such deviations occur.

(c) Operators required to comply with the requirements should include operating procedures in the operations manual as required.

III. OPERATING PROCEDURES — CAT II (AMC3 SPA.LVO.105(c))

For CAT II operations, the following should apply:

(a) The flight crew should consist of at least two pilots.

(b) The approach should be flown using a certified system as identified in the AFM.

(c) If the approach is flown using autopilot, for a manual landing the autopilot should remain engaged until after the pilot has achieved visual reference.

(d) All height call-outs below 200 ft above the runway threshold elevation should be determined by the use of a radio altimeter or other device capable of providing equivalent performance.

(e) The DH should be determined by the use of a radio altimeter or other device capable of providing equivalent performance, if so determined by the aircraft certification process.

(f) At DH, the following visual references should be distinctly visible and identifiable to the pilot:

(1) a segment of at least three consecutive lights, which are the centre line of the approach lights or TDZ lights or runway centre line lights or edge lights or a combination of these; and

(2) a visual reference that should include a lateral element of the ground pattern, such as an approach lighting crossbar, or the landing threshold, or a barrette of the TDZ lighting unless the operation is conducted using a HUD or an equivalent system to touchdown.

IV. OPERATING PROCEDURES — CAT III (AMC4 SPA.LVO.105(c))

For CAT III operations, the following should apply:

(a) The flight crew should consist of at least two pilots.

(b) The approach should be flown using a certified system as identified in the AFM.

(c) All height call-outs below 200 ft above the runway threshold elevation should be determined by the use of a radio altimeter or other device capable of providing equivalent performance.

(d) For operations in which a DH is used, the DH should be determined by the use of a radio altimeter or other device capable of providing equivalent performance, if so determined by the aircraft certification process.

(e) At DH, the following visual references should be distinctly visible and identifiable to the pilot:

(1) for operations conducted either with fail-passive flight control systems or with the use of an approved HUD or equivalent display system: a segment of at least three consecutive lights, which are the centre line of the approach lights, or TDZ lights, or runway centre line lights, or runway edge lights, or a combination of these; and

(2) for operations conducted either with fail-operational flight control systems or with a fail-operational hybrid landing system using a DH: at least one centre line light to be attained and maintained by the pilot.

(f) For operations with no DH, there is no specification for visual reference with the runway prior to touchdown.

V. OPERATING PROCEDURES — SA CAT I - (AMC5 SPA.LVO.105(c))

For SA CAT I operations, the following should apply:

(a) The approach should be flown using a certified system as identified in the AFM.

(b) All height call-outs below 200 ft above the runway threshold elevation should be determined by the use of a radio altimeter or other device capable of providing equivalent performance.

(c) The DH should be determined by the use of a radio altimeter or other device capable of providing equivalent performance, if so determined by the aircraft certification process.

(d) At DH the following visual references should be visible to the pilot:

(1) a segment of at least three consecutive lights, which are the centre line of the approach lights, or TDZ lights, or runway centre line lights, or runway edge lights, or a combination of these; and

(2) a visual reference that should include a lateral element of the ground pattern, such as an approach lighting crossbar, or the landing threshold, or a barrette of the TDZ lighting unless the operation is conducted utilising an approved HUD or an equivalent system usable down to 120 ft above the runway threshold.

VI. OPERATING PROCEDURES — SA CAT II -(AMC6 SPA.LVO.105(c))

For SA CAT II operations, the following should apply:

(a) The flight crew should consist of at least two pilots.

(b) The approach should be flown using a certified HUDLS or autoland system as identified in the AFM.

(c) All height call-outs below 200 ft above the runway threshold elevation should be determined by the use of a radio altimeter or other device capable of providing equivalent performance.

(d) The DH should be determined by the use of a radio altimeter or other device capable of providing equivalent performance, if so determined by the aircraft certification process.

(e) At DH the visual references should be distinctly visible and identifiable to the pilot:

(1) a segment of at least three consecutive lights, which are the centre line of the approach lights or TDZ lights, or runway centre line lights, or runway edge lights or a combination of these;

(2) a visual reference that should include a lateral element of the ground pattern, such as an approach lighting crossbar, or the landing threshold, or a barrette of the TDZ lighting.

VII. OPERATING PROCEDURES — EFVS / EVS OPERATIONS TO A RUNWAY

(AMC7 SPA.LVO.105(c))

For EFVS operations to a runway, the following should apply:

(a) The approach should be flown using a certified EFVS / EVS system ~~EFVS-A or EFVS~~-L as identified in the AFM.

(b) The pilot flying should use the EFVS / EVS throughout the approach.

(c) In multi-pilot operations, the pilot monitoring should monitor the EFVS / EVS -derived information.

(d) The approach between the final approach fix (FAF) and the DA/H should be flown using vertical flight path guidance mode (e.g. flight director).

(e) The approach may be continued below the DA/H provided that the pilot can identify on the EFVS / EVS image either:

(1) the approach light system; or

(2) both of the following:

(i) the runway threshold identified by the beginning of the runway landing surface, the threshold lights or the runway end identifier lights; and

(ii) the TDZ identified by the TDZ lights, the TDZ runway markings or the runway edge lights.

(f) Unless the aircraft is equipped with a certified ~~EFVS-L~~ EFVS / EVS, a missed approach should be executed promptly if the required visual reference is not distinctly visible and identifiable to the pilot without reliance on the EFVS / EVS by the following height above the threshold:

(1) the height below which an approach should not be continued if natural visual reference is not acquired by the crew as stated in the AFM; or

(2) if the AFM does not specify such a height, 100 ft.

VIII. FLIGHT CREW ACTIONS IN CASE OF AUTOPILOT FAILURE AT OR BELOW DH IN FAIL-PASSIVE CAT III OPERATIONS GM1 SPA.LVO.105(c)

For operations to actual RVR values less than 300 m, a missed approach procedure is assumed in the event of an autopilot failure at or below DH. This means that a missed approach procedure is the normal action. However, the wording recognises that there may be circumstances where the safest action is to continue the landing. Such circumstances include the height at which the failure occurs, the actual visual references, and other malfunctions. This would typically apply to the late stages of the flare. In conclusion, it is not forbidden to continue the approach and complete the landing when the pilot-in-command/commander determines that this is the safest course of action. The operator’s policy and the operational instructions should reflect this information.

Appendix 1 to ANTR OPS 3.465

Minimum Visibilities for VFR Operations

Airspace class		A B C D E (Note 1)	F G	
			Above 900 m (3 000 ft) AMSL or above 300 m (1 000 ft) above terrain, whichever is the higher	At and below 900 m (3 000 ft) AMSL or 300 m (1 000 ft) above terrain, whichever is the higher
Distance from cloud		1 500 m horizontally 300 m (1 000 ft) vertically		Clear of cloud and in sight of the surface
Flight visibility	8 km at and above 3 050 m (10 000 ft) AMSL (Note 1) 5 km below 3 050 m (10 000 ft) AMSL			5 km (Note 3)

Note 1: VMC Minima for Class A airspace are included for guidance but do not imply acceptance of VFR flights in Class A airspace.

Note 2: When the height of the transition altitude is lower than 3 050 m (10 000 ft) AMSL, FL 100 should be used in lieu of 10 000ft.

Note 3: Helicopters may be operated in flight visibility down to 1 500 m by day, provided the appropriate ATS authority permits use of a flight visibility less than 5 km, and the circumstances are such, that the probability of encounters with other traffic is low, and the IAS is 140 kts or less. When so prescribed by the appropriate ATS Authority, helicopters may be permitted to operate down to a flight visibility of 800m by day.

Appendix 2 to ANTR OPS 3.465

Minima for flying between helidecks located in Class G airspace

	Day		Night	
	Height (Note 1)	**Visibility**	**Height (Note 1)**	**Visibility**
Single Pilot	300 ft	3 km	500 ft	5 km
Two Pilots	300 ft	(Note 2)	500 ft	(Note 3)

Note 1: *The cloud base shall be such as to allow flight at the specified height below and clear of cloud*

Note 2: *Helicopters may be operated in flight visibility down to 800 m provided the destination, or an intermediate structure, is continuously visible.*

Note 3: *Helicopters may be operated in flight visibility down to 1 500 m provided the destination or an intermediate structure are continuously visible.*

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SUBPART F – PERFORMANCE GENERAL

ANTR OPS 3.470 Applicability

(a) The operator shall ensure that;

(1) Helicopters operating to/from heliports or landing locations located in a congested hostile environment: or

(2) Helicopters which have a maximum approved passenger seating configuration (MAPSC) of more than 19;

are operated in accordance with ANTR-OPS 3, Subpart G (Performance Class 1); except helicopters:

(i) with a maximum approved passenger seating configuration (MAPSC) of more than 19 and operated to/from helidecks; which may be operated in accordance with ANTR-OPS 3.517(a); or

(ii) which have an operational approval in accordance with Appendix 1 to ANTR- OPS 3.005(i)] (b)

(b) Unless otherwise prescribed by sub-paragraph (a) above, the operator shall ensure that helicopters which have a maximum approved passenger seating configuration of 19 or less but more than 9 are operated in accordance with OPS Part 3, Subpart G or H (Performance Class 1 or 2);

(c) Unless otherwise prescribed by sub-paragraph (a) above, the operator shall ensure that helicopters which have a maximum approved passenger seating configuration of 9 or less, are operated in accordance with OPS Part 3, Subpart G, H or I (Performance Class 1, 2 or 3).

Note: Guidance on the level of performance intended by the Standards and Recommended Practices of this chapter is contained in ICAO DOC 10110.

ANTR OPS 3.475 General

(a) The operator shall ensure that the mass of the helicopter:

(1) At the start of the take-off;

or, in the event of in-flight replanning

(2) At the point from which the revised operational flight plan applies,

is not greater than the mass at which the requirements of the appropriate Subpart can be complied with for the flight to be undertaken, allowing for expected reductions in mass as the flight proceeds, and for such fuel jettisoning as is provided for in the particular requirement.

(b) The operator shall ensure that the approved performance data contained in the Helicopter Flight Manual is used to determine compliance with the requirements of the appropriate Subpart, supplemented as necessary with other data acceptable to the BCAA as prescribedin the relevant Subpart. When applying the factors prescribed in the appropriate Subpart, account may be taken of any operational factors already incorporated in the Helicopter Flight Manual performance data to avoid double application of factors.

(c) When showing compliance with the requirements of the appropriate Subpart, due account shall be taken of the following parameters:

(1) mass of the helicopter;

(2) helicopter configuration;

(3) environmental conditions, in particular:

(i) pressure-altitude, and temperature;

(ii) wind:

(A) for take-off, take-off flight path and landing requirements, accountability for wind shall be no more than 50% of any reported steady head wind component of 5 knots or more.

(B) Where take-off and landing with a tail wind component is permitted in the Helicopter Flight Manual, and in all cases for the takeoff flight path, not less than 150% of any reported tail wind component shall be taken into account.

(C) Where precise wind measuring equipment enables accurate measurement of wind velocity over the point of take-off and landing, alternate wind components specific to a site may be approved by the BCAA. (See AC OPS 3.475(c)(3)(ii));

(4) operating techniques; and

(5) operation of any system which have adverse effect on performance.

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(d) In applying the Standards of this chapter, account shall be taken of all factors that significantly affect the performance of the helicopter (such as: mass, operating procedures, the pressure-altitude appropriate to the elevation of the operating site, temperature, wind and condition of the surface). Such factors shall be taken into account directly as operational parameters or indirectly by means of allowances or margins, which may be provided in the scheduling of performance data or in the code of performance in accordance with which the helicopter is being operated.

(e) ~~(d)~~ The BCAA, as the State of Registry, shall take such precautions as are reasonably possible to ensure that the general level of safety contemplated by these provisions is maintained under allexpected operating conditions, including those not covered specifically by the provisions of Subparts G, H and I.

(f) ~~(e)~~ Placards, listings, instrument markings, or combinations thereof, containing those operating limitations prescribed for visual presentation, shall be displayed in the helicopter.

ANTR-OPS 3.477 Obstacle accountability (EASA Air Ops CAT.POL.H.110)

(See AC to Subpart H)

~~(a) For the purpose of obstacle clearance requirements, an obstacle, located beyond the FATO, in the take-off flight path or the missed approach flight path, shall be considered if its lateral distance from the nearest point on the surface below the intended flight path is not further than:~~

~~(1) For VFR operations:~~

~~(i) half of the minimum FATO (or the equivalent term used in the Flight Manual) width defined in the Helicopter Flight Manual (or, when no width is defined 0.75 D), plus 0.25 times D (or 3 m, whichever is greater), plus:~~

~~- 0.10 DR for VFR day operations~~
~~- 0.15 DR for VFR night operations~~

~~(2) For IFR operations:~~

~~(i) 1.5 D (or 30 m, whichever is greater), plus:~~

~~- 0.10 DR for IFR operations with accurate course guidance~~

~~- 0.15 DR for IFR operations with standard course guidance~~

~~- 0.30 DR for IFR operations without course guidance~~

~~(ii) when considering the missed approach flight path, the divergence of the obstacle accountability area only applies after the end of the takeoff distance available;~~

~~(iii) standard course guidance includes ADF and VOR guidance. Accurate course guidance include ILS, MLS or other course guidance providing an equivalent navigational accuracy.~~

~~(3) For operations with initial takeoff conducted visually and converted to IFR/IMC at a transition point, the criteria required in (1) apply up to the transition point then the criteria required in (2) apply after the transition point:~~

~~(i) the transition point cannot be located before the end of TODRH for helicopters operating in performance Class 1 and before the DPATO for helicopters operating in performance Class 2;~~

~~(b) For take-off using a backup (or a lateral transition) procedure; for the purpose of obstacle clearance requirements, an obstacle, located in the back-up (or lateral transition) area, shall be considered if its lateral distance from the nearest point on the surface below the intended flight path is not further than:~~

~~(1) half of the minimum FATO (or the equivalent term used in the Flight Manual) width defined in the Helicopter Flight Manual (or, when no width is defined 0.75 D), plus 0.25 times D (or 3 m, whichever is greater), plus 0.10 for VFR day, or 0.15 for VFR night, of the distance travelled from the back of the FATO. (see AC OPS 3.490(d))~~

(a) For the purpose of obstacle clearance requirements, an obstacle located beyond the FATO, in the take-off flight path, or the missed approach flight path shall be considered if its lateral distance from the nearest point on the surface below the intended flight path is not further than the following:

(1) For operations under VFR:

(i) half of the minimum width defined in the AFM — or, when no width is defined, ‘0,75 × D’, where D is the largest dimension of the helicopter when the rotors are turning;

(ii) plus, the greater of ‘0,25 × D’ or ‘3 m’;

(iii) plus:

(A) 0,10 × distance DR for operations under VFR by day; or

(B) 0,15 × distance DR for operations under VFR at night.

(2) For operations under IFR:

(i) ‘1,5 D’ or 30 m, whichever is greater, plus:

(A) 0,10 × distance DR, for operations under IFR with accurate course guidance;

(B) 0,15 × distance DR, for operations under IFR with standard course guidance; or

(C) 0,30 × distance DR for operations under IFR without course guidance.

(ii) When considering the missed approach flight path, the divergence of the obstacle accountability area only applies after the end of the take-off distance available.

(3) For operations with initial take-off conducted visually and converted to IFR/IMC at a transition point, the criteria required in (1) apply up to the transition point, and the criteria required in (2) apply after the transition point. The transition point cannot be located before the end of the take-off distance required for helicopters (TODRH) operating in performance class 1 or before the defined point after take-off (DPATO) for helicopters operating in performance class 2.

(b) For take-off using a back-up or a lateral transition procedure, for the purpose of obstacle clearance requirements, an obstacle located in the back-up or lateral transition area shall be considered if its lateral distance from the nearest point on the surface below the intended flight path is not further than:

(1) half of the minimum width defined in the AFM or, when no width is defined, ‘0,75 × D’;

(2) plus the greater of ‘0,25 × D’ or ‘3 m’;

(3) plus:

(i) for operations under VFR by day 0,10 × the distance travelled from the back of the FATO, or

(ii) for operations under VFR at night 0,15 × the distance travelled from the back of the FATO.

(c) Obstacles may be disregarded if they are situated beyond:

(1) 7 R (R - Rotor Radius) for day operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb;

(2) 10 R for night operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb;

(3) 300 m if navigational accuracy can be achieved by appropriate navigation aids; and

(4) 900 m in the other cases.

ANTR OPS 3.480 Terminology

(a) Terms used in Subparts F, G, H and I and not defined in ANTR Volume 1 have the following meaning:

(1) 'Category A' with respect to helicopters means multi-engine helicopters designed with engine and system isolation features specified in CS-27/29, 14 CFR Part 27/29 or equivalent acceptable to the BCAA and Helicopter Flight Manual performance information based on a critical engine failure concept which assures adequate designated surface area and adequate performance capability for continued safe flight in the event of an engine failure.

(2) 'Category B' with respect to helicopters means single-engine or multi-engine helicopters which do not fully meet all Category A standards. Category B helicopters have no guaranteed stay-up ability in the event of engine failure and unscheduled landing is assumed.

(3) *Committal Point* (CP). The committal point is defined as the point in the approach at which the pilot flying (PF) decides that, in the event of a power unit failure being recognised, the safest option is to continue to the deck.

(4) *Congested area*. In relation to a city, town or settlement, any area which is substantially used for residential, commercial or recreational purposes (See also definitions of hostile and non-hostile environment).

(5) *D*. The largest dimension of the helicopter when the rotors are turning.

(6) *Defined point after take-off (DPATO).* The point, within the take-off and initial climb phase, before which the helicopter’s ability to continue the flight safely, with the critical power unit inoperative, is not assured and a forced landing may be required.

(7) *Defined point before landing (DPBL)*. The point within the approach and landingphase, after which the helicopter’s ability to continue the flight safely, with the critical power unit inoperative, is not assured and a forced landing may be required.

Note: Defined points apply to helicopters operated in Performance Class 2 only.

(8) *Distance DR*. DR is the horizontal distance that the helicopter has travelled from the end of the take-off distance available.

(9) *Elevated heliport or landing location*. A heliport or landing location which is at least 3 m above the surrounding surface.

(10) *Exposure time*. The actual period during which the performance of the helicopter with the critical power unit inoperative in still air does not guarantee a safe forced landingor the safe continuation of the flight. (See also definition of maximum permitted exposure time).

(11) *Helideck*. A heliport or landing location located on a floating or fixed off-shore structure.

(12) *Heliport*. An aerodrome or a defined area of land, water or a structure used or intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.

Note 1: Throughout this Part, when the term “Heliport” is used, it is intended that the term also applies to aerodromes primarily meant for the use of aeroplanes.

Note 2: Helicopters may be operated to and from landing locations areas other than heliports.

(13) *Aerodrome.* A defined area on land or water (including any building, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

(14) *Aircraft.* Any machine that can derive support in the atmosphere from the reaction of the air other than the reaction of the air against the earth's surface.

(15) *Hostile environment*:

(i) An environment in which:

(A) A safe forced landing cannot be accomplished because the surface is inadequate; or

(B) The helicopter occupants cannot be adequately protected from the elements; or

(C) Search and rescue response/capability is not provided consistent with anticipated exposure; or

(D) There is an unacceptable risk of endangering persons or property on the ground;

(ii) In any case, the following areas shall be considered hostile:

(A) For overwater operations, the open sea areas designated by the authority of the State concerned; and

(B) Those parts of a congested area without adequate safe forced landing areas.

(See IEM OPS 3.480(a)(15))

(16) *Landing decision point (LDP)*. The point used in determining landing performance from which, a power unit failure having been recognised at this point, the landing may be safely continued or a baulked landing initiated.

(17) *Landing distance available.* The length of the final approach and take-off area plus any additional area declared available and suitable for helicopters to complete the landing manoeuvre from a defined height.

(18) *Landing distance required.* The horizontal distance required to land and come to a full stop from a point 10·7 m (35 ft) above the landing surface.

(19) *Maximum approved passenger seating configuration*. The maximum passenger seating capacity of an individual helicopter, excluding crew seats, used by the operator, approved by the BCAA and included in the Operations Manual.

(20) *Maximum permitted exposure time.* A period, determined on the basis of the power unit failure rate recorded for the helicopter's engine type, during which the probability of a power unit failure can be discounted. (See also definition of exposure time).

(21) *Non-hostile environment*.

(i) An environment in which:

(A) A safe forced landing can be accomplished; and

(B) The helicopter occupants can be protected from the elements; and

(C) Search and rescue response/capability is provided consistent with the anticipated exposure;

(ii) In any case, those parts of a congested area with adequate safe forced landing areas shall be considered non-hostile.

(22) *Obstacle*. Obstacles include the surface of the earth, whether land or sea.

(23) *Performance Class 1*. Performance Class 1 operations are those with performance such that, in the event of failure of the critical power unit, the helicopter is able toland within the rejected take-off distance available or safely continue the flight to an appropriate landing area, depending on when the failure occur.

(24) *Performance Class 2*. Performance Class 2 operations are those operations such that, in the event of critical power unit failure, performance is available to enable the helicopter to safely continue the flight, except when the failure occurs early during the take-off manoeuvre or late in the landing manoeuvre, in which cases a forced landing may be required.

(25) *Performance Class 3*. Performance Class 3 operations are those operations such that, in the event of a power unit failure at any time during the flight, a forced landing may be required in a multi-engined helicopter but will be required in a single engine helicopter.

(26) *Rejected take-off distance available (RTODAH).* The length of the final approach and take-off area declared available and suitable for helicopters operated in Performance Class 1 to complete a rejected take-off.

(27) *Rejected take-off distance required (RDODRH).* The horizontal distance required from the start of the take-off to the point where the helicopter comes to a full stop following a power unit failure and rejection of the take-off at the take-off decision point.

(28) *Reported headwind component.* Reported headwind component is interpreted as being that reported at the time of flight planning and may be used provided there is no significant change of unfactored wind prior to take-off.

(29) *Rotation Point* (RP). The rotation point is defined as the point at which a cyclic input is made to initiate a nose-down attitude change during the take-off flight path. It is the last point in the take-off path from which, in the event of an engine failure being recognised, a forced landing on the deck can be achieved.

(30) *R*. Rotor radius.

(31) *Safe forced landing*. Unavoidable landing or ditching with a reasonable expectancy of no injuries to persons in the aircraft or on the surface.

(32) *Take-off decision point (TDP)*. The point used in determining take-off performance from which, a power unit failure having been recognised at this point, either a rejected take-off may be made or a take-off safely continued.

(33) *Take-off distance available (TODAH)*. The length of the final approach and take-off area plus the length of helicopter clearway (if provided) declared available and suitable for helicopters to complete the take-off.

(34) *Take-off distance required (TODRH).* The horizontal distance required from the start of the take-off to the point at which VTOSS, a selected height and a positive climb gradient are achieved, following failure of the critical power unit being recognised at TDP, the remaining power units within approved operating limits. The selected height is to be determined with the use of Helicopter Flight Manual data, and is to be at least 10.7 m (35 ft) above:

(i) the take-off surface; or

(ii) as an alternative, a level defined by the highest obstacle in the takeoff distance required.

(35) *Take-off flight path.* The vertical and horizontal path, with the critical power unit inoperative, from a specified point in the take-off to 1000 ft above the surface.

(36) *Take-off mass*. The take-off mass of the helicopter shall be taken to be its mass,including everything and everyone carried at the commencement of the take-off.

(37) *Touchdown and lift-off area (TLOF).* A load bearing area on which a helicopter may touchdown or lift off.

(38) *Vy*. Best rate of climb speed.

(b) The terms 'take-off distance required', 'take-off flight path', 'critical power unit inoperative en-route flight path' all have their meanings defined in the airworthiness requirements under which the helicopter was certificated, or as specified by the BCAA if it finds the data provided in the Helicopter Flight Manual inadequate for showing compliance with the performance operating limitations.

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SUBPART G – PERFORMANCE CLASS 1

ANTR OPS 3.485 General

The operator shall ensure that helicopters operated in Performance Class 1 are certificated in Category A.

(See AC OPS 3.480(a)(1) and (a)(2))

ANTR OPS 3.490 Take-off

(a) The operator shall ensure that:

(1) The take-off mass does not exceed the maximum take-off mass specified in the Helicopter Flight Manual for the procedure to be used (see AC OPS 3.490 & 3.510).

(2) The take-off mass is such that:

(i) it is possible to reject the takeoff and land on the FATO in case of the critical power-unit failure being recognized at or before the TDP;

(ii) The rejected take-off distance required does not exceed the rejected takeoff distance available; and

(iii) The take-off distance required does not exceed the take-off distance available

(iv) As an alternative, the requirement in ANTR-OPS 3.490(a)(2)(iii) above may be disregarded provided that the helicopter, with the critical power unit failure recognised at TDP can, when continuing the take-off, clear all obstacles to the end of the take-off distance required by a vertical margin of not less than 10.7 m (35 ft) (see AC OPS 3.480(a)(31));

(b) When showing compliance with subparagraph (a) above, account shall be taken of the appropriate parameters of ANTR-OPS 3.475(c) at the heliport or landing location of departure:

(c) The part of the take-off up to and including TDP shall be conducted in sight of the surface such that a rejected take-off can be carried out.

(d) For take-off using a backup (lateral transition) procedure, the operator shall ensure that, with the critical power-unit inoperative, all obstacles in the back-up (lateral transition) areaare cleared by an adequate margin. (see AC OPS 3.490(d))

ANTR OPS 3.495 Take-off Flight Path

(a) The operator shall ensure that, from the end of the take-off distance required with the critical power unit failure recognised at the TDP:

(1) The take-off mass is such that the take-off flight path provides a vertical clearance of not less than 10.7 m (35 ft) for VFR operations and 10.7 m (35 ft) + 0.01 DR for IFR operations above all obstacles located in the climb path. Only obstacles as specified in ANTR-OPS 3.477 have to be considered.

(2) Where a change of direction of more than 15° is made, adequate allowance is made for the effect of bank angle on the ability to comply with the obstacle clearance requirements. This turn is not to be initiated before reaching a height of 61 m (200 ft) above the take-off surface unless permitted as part of an approved procedure in the Flight Manual.

(b) When showing compliance with subparagraph (a) above, account shall be taken of the appropriate parameters of ANTR-OPS 3.475(c) at the heliport or landing location of departure.

ANTR OPS 3.500 En-route - critical power unit inoperative

(a) The operator shall ensure that the en-route flight path with the critical power unit inoperative, appropriate to the meteorological conditions expected for the flight complies with either subparagraph (1), (2) or (3) below at all points along the route.

(1) When it is intended that the flight will be conducted at any time out of sight of the surface, the mass of the helicopter permits a rate of climb of at least 50 ft/minute with the critical power unit inoperative at an altitude of at least 300 m (1 000 ft) 600 m (2 000 ft) in areas of mountainous terrain, above all terrain and obstacles along the route within 9.3 km (5 nm) on either side of the intended track.

(2) When it is intended that the flight will be conducted without the surface in sight, the flight path permits the helicopter to continue flight from the cruising altitude to a height of 300 m (1000 ft) above a landing site where a landing can be made in accordance with ANTR-OPS 3.510. The flight path clears vertically, by at least 300 m (1000 ft), 600 m (2000 ft) in areas of mountainous terrain, all terrain and obstacles along the route within 9.3 km (5 nm) on either side of the intended track. Drift-down techniques may be used.]

(3) When it is intended that the flight will be conducted in VMC with the surface in sight, the flight path permits the helicopter to continue flight from the cruising altitude to a height of 300 m (1000 ft) above a landing site where a landing can be made in accordance with ANTR-OPS 3.510, without flying at any time below the appropriate minimum flight altitude, obstacles within 900m on either side of the route need to be considered.

(b) When showing compliance with paragraph (a)(2) or (a)(3) above, the operator shall ensure that:

(1) The critical power unit is assumed to fail at the most critical point along the route.

(2) Account is taken of the effects of winds on the flight path.

(3) Fuel jettisoning is planned to take place only to an extent consistent with reaching the heliport or landing location with the required fuel reserves and using a safe procedure (See AC OPS 3.500(b)(3)).

(4) Fuel jettisoning is not planned below 1000 ft above terrain.

(c) The width margins of subparagraphs (a)(1) and (a)(2) above shall be increased to 18.5 km (10 nm) if the navigational accuracy cannot be met for 95% of the total flying time (see ANTR-OPS 3.240, 3.243 and 3.250.

ANTR OPS 3.505 *Intentionally blank*

ANTR OPS 3.510 Landing

(a) The operator shall ensure that:

(1) The landing mass of the helicopter at the estimated time of landing does not exceed the maximum mass specified in the Helicopter Flight Manual for the procedure to be used (see AC OPS 3.490 & 3.510).

(2) in the event of the critical power unit failure being recognised at any point at or before the LDP, it is possible either to land and stop within the FATO, or to perform a balked landing and clear all obstacles in the flight path by a vertical margin of 10.7 m (35 ft) (see AC OPS 3.480(a)(32)). Only obstacles as specified in ANTR-OPS 3.477 have to be considered;

(3) in the event of the critical power-unit failure being recognised at any point at or after the LDP, it is possible to clear all obstacles in the approach path; and

(4) in the event of the critical power-unit failure being recognised at any point at or after the LDP, it is possible to land and stop within the FATO.

(b) When showing compliance with subparagraph (a) above, account shall be taken of the appropriate parameters of ANTR-OPS 3.475(c) for the estimated time of landing at the destination heliport or landing location, or any alternate if required.

(c) That part of the landing from the LDP to touchdown, shall be conducted in sight of the surface.

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SUBPART H – PERFORMANCE CLASS 2

ANTR OPS 3.515 General

(a) The operator shall ensure that

(1) helicopters operated in Performance Class 2 are certificated in Category A. (See AC to ANTR-OPS 480(a)(1) and (a)(2).

ANTR OPS 3.517 Operations Without an Assured Safe Forced Landing Capability

(a) The operator shall be satisfied that operations without an assured safe forced landing capability during the take-off and landing phases are not conducted unless the operator has been granted the relevant approval by the BCAA in accordance with Appendix 1 to ANTR-OPS3.517(a). (See also ANTR-OPS 3.470(a)(1).)

ANTR OPS 3.520 Take-off

(See IEM OPS 3.520)

(See IEM OPS 3.520 & 3.535)

(a) The operator shall be satisfied that:

(1) The take-off mass does not exceed the maximum mass specified for a rate of climb of 150 ft/min at 300 m (1 000 ft) above the level of the heliport or landing location with the critical power unit inoperative and the remaining power units operating at an appropriate power rating.

(2) For operations other than specified in ANTR-OPS 3.517(a), the takeoff is conducted such that a safe forced landing can be executed until the point where safe continuation of the flight is possible (see AC to Subpart H paragraph 6.2).

(3) For operations in accordance with ANTR-OPS 3.517(a) in addition to the requirements of (a)(1) above:

(i) The take-off mass does not exceed the maximum mass specified in the Helicopter Flight Manual for an AEO OGE hover in still air with all power units operating at an appropriate power rating.

(ii) For operations to/from a helideck:

(A) with a helicopter that has a maximum approved passenger seating configuration (MAPSC) of more than 19; and

(B) from 1st January 2010 any helicopter operated to/from a helideck located in a non-congested hostile environment as defined in ANTR-OPS 3.480(15)(ii)(A)

the take-off mass takes into account: the procedure; deck-edge miss; and drop down appropriate to the height of the helideck – with the critical power unit(s) inoperative and the remaining power units operating at an appropriate power rating.

(b) When showing compliance with subparagraph (a) above, account shall be taken of the appropriate parameters of ANTR-OPS 3.475(c) at the heliport or landing location of departure.

(c) The part of the take-off before the requirement of ANTR-OPS 3.525 is met shall be conducted in sight of the surface.

ANTR OPS 3.525 Take-off Flight Path

(a) The operator shall be satisfied that from DPATO or, as an alternative, no later than 200 ft above the take-off surface, with the critical power unit inoperative the requirements of ANTR-OPS 3.495(a)(1), (2) and (b) are met.

ANTR OPS 3.530 En-route - Critical power unit inoperative

(a) The operator shall ensure that the requirement of ANTR-OPS 3.500 is met.

ANTR OPS 3.535 Landing

(See AC to Subpart H)

(See IEM OPS 3.520 & 3.535)

(a) The operator shall be satisfied that:

(1) The landing mass at the estimated time of landing does not exceed the maximum mass specified for a rate of climb of 150 ft/min at 300 m (1000 ft) above the level of the heliport or landing location with the critical power unit inoperative and the remaining power units operating at an appropriate power rating.

(2) If the critical power unit fails at any point in the approach path:

(i) a balked landing can be carried out meeting the requirement of ANTR-OPS 3.525; or

(ii) for operations other than specified in ANTR-OPS 3.517(a) the helicopter can perform a safe-forced landing.

(3) For operations in accordance with ANTR-OPS 3.517(a) in addition to the requirements of (a)(1) above:

(i) The landing mass does not exceed the maximum mass specified in the Helicopter Flight Manual for an AEO OGE hover in still air with all power units operating at an appropriate power rating.

(ii) For operations to/from a helideck:

(A) with a helicopter that has a maximum approved passenger seating configuration (MAPSC) of more than 19; and

(B) from 1st January 2010 any helicopters operated to/from a helideck located in a non-congested hostile environment as defined in ANTR-OPS 3.480(15)(ii)(A).

the landing mass takes into account the procedure, and drop down appropriate to the height of the helideck - with the critical power unit inoperative and theremaining power unit(s) operating at an appropriate power rating.

(b) When showing compliance with subparagraph (a) above, account shall be taken of the appropriate parameters of ANTR-OPS 3.475(c) at the destination heliport or landing location or any alternate, if required.

(c) The part of the landing after which the requirement of ANTR-OPS 3.525 cannot be met shall be conducted in sight of the surface.

Appendix 1 to ANTR OPS 3.517(a)

Helicopter operations without an assured safe forced landing capability

(See ANTR-OPS 3.517(a))]

(See AC-1 to Appendix 1 to ANTR-OPS 3.517(a))]

(See AC-2 to Appendix 1 to ANTR-OPS 3.517(a))]

(See ANTR OPS 3.295 for Selection of Heliports or Landing Locations and risk assessment requirements)

(a) Approval:

(1) Following a risk assessment, the operator may be authorised to conduct operations without an assured safe forced landing capability during the take-off and landing phases, under an approval specifying:

(i) The type of helicopter; and

(ii) The type of operations.

(2) Such an approval will be subject to the following conditions:

(i) A set of conditions to be implemented by the operator to obtain and maintain the approval for the helicopter type;

(ii) Implementation of a Usage Monitoring System

SUBPART I – PERFORMANCE CLASS 3

ANTR OPS 3.540 General

(a) The operator shall ensure that:

(1) Helicopters operated in Performance Class 3 are certificated in either Category A or B (see also AC OPS 3.480(a)(1) and (a)(2)).

(2) Operations are only conducted from/to those heliports or landing locations and over such routes, areas and diversions contained in a non-hostile environment, except for the take-off and landing phase as provided in (b) below.

(3) Operators of helicopters operating in performance Class 3 in IMC shall have a programme for engine trend monitoring and shall utilize the engine and helicopter manufacturers' recommended instruments, systems and operational/ maintenance procedures to monitor the engines. In order to minimize the occurrence of mechanical failures, helicopters operating in IMC in performance Class 3 should utilize vibration health monitoring for the tail-rotor drive system.

(b) The operator may conduct operations to/ from a heliport or landing location located outside a congested hostile environment, without an assured safe forced landing capability during the take-off and landing phases (see AC OPS 3.540(b)):

(1) during take-off; before reaching Vy or 200 ft above the take-off surface; or

(2) during landing; below 200 ft above the landing surface;

provided the operator has been granted a relevant approval by the BCAA in accordance with Appendix 1 to ANTR-OPS 3.517(a).

(c) The operator shall ensure that operations are not conducted:

(1) out of sight of the surface;

(2) at night;

(3) when the ceiling is less than 600 ft; or

(4) when the visibility is less than 800m.

ANTR OPS 3.545 Take-off

The operator shall ensure that:

(a) The take-off mass does not exceed the maximum take-off mass specified for a hover in ground effect with all power units operating at take-off power. If conditions are such that a hover in ground effect is not likely to be established, the take-off mass shall not exceed the maximum take-off mass specified for a hover out of ground effect with all power units operating at take-off power.

(b) in the event of a power unit failure, the helicopter is able to perform a safe forced landing, except when operated in accordance with the alleviation contained in sub-paragraph 3.540(b).

ANTR OPS 3.550 En-route

The operator shall ensure that:

(a) The helicopter is able, with all power units operating within the maximum continuous power conditions specified, to continue along its intended route or to a planned diversion without flying at any point below the appropriate minimum flight altitude; and

(b) in the event of a power unit failure, the helicopter is able to perform a safe forced landing.

ANTR OPS 3.555 Landing

The operator shall ensure that:

(a) The landing mass of the helicopter at the estimated time of landing does not exceed the maximum landing mass specified for a hover in ground effect, with all power units operating at take-off power. If conditions are such that a hover in ground effect is not likely to be established, the landing mass shall not exceed the maximum landing mass specified for a hover out of ground effect with all power units operating at take-off power.

(b) in the event of a power unit failure, the helicopter is able to perform a safe forced landing, except when operated in accordance with the alleviation contained in sub-paragraph 3.540(b).

SUBPART J– MASS AND BALANCE

ANTR OPS 3.605 General

(See Appendix 1 to ANTR OPS 3.605)

(a) The operator shall ensure that during any phase of operation, the loading, mass and centre of gravity of the helicopter complies with the limitations specified in the approved Helicopter Flight Manual, or the Operations Manual if more restrictive.

(b) The operator must establish the mass and the centre of gravity of any helicopter by actual weighing prior to initial entry into service and thereafter at intervals of 4 years. The accumulated effects of modifications and repairs on the mass and balance must be accounted for and properly documented. Furthermore, helicopters must be reweighed if the effect of modifications on the mass and balance is not accurately known.

(c) The operator must determine the mass of all operating items and crew members included in the helicopter dry operating mass by weighing or by using standard masses. The influenceof their position on the helicopter centre of gravity must be determined.

(d) The operator must establish the mass of the traffic load, including any ballast, by actual weighing or determine the mass of the traffic load in accordance with standard passenger and baggage masses as specified in ANTR OPS 3.620.

(e) The operator must determine the mass of the fuel load by using the actual density or, if not known, the density calculated in accordance with a method specified in the Operations Manual. (See IEM OPS 3.605(e).)

ANTR OPS 3.607 Terminology

(a) *Dry Operating Mass*. The total mass of the helicopter ready for a specific type of operation excluding all usable fuel and traffic load.

(b) *Maximum Take-Off Mass*. The maximum permissible total helicopter mass at take-off.

(c) *Traffic Load*. The total mass of passengers, baggage and cargo, including any non-revenue load.

(d) *Passenger classification.*

(1) Adults, male and female, are defined as persons of an age of 12 years and above.

(2) Children are defined as persons of an age of two years and above but who are less than 12 years of age.

(3) Infants are defined as persons who are less than 2 years of age.

ANTR OPS 3.610 Loading, mass and balance

The operator shall specify, in the Operations Manual, the principles and methods involved in the loading and in the mass and balance system that meet the requirements of ANTR OPS 3.605. Thissystem must cover all types of intended operations.

ANTR OPS 3.615 Mass values for crew

(a) The operator shall use the following mass values to determine the dry operating mass:

(1) Actual masses including any crew baggage; or

(2) Standard masses, including hand baggage, of 85 kg for crew members and; or

(3) Other standard masses acceptable to the BCAA.

(b) The operator must correct the dry operating mass to account for any additional baggage. The position of this additional baggage must be accounted for when establishing the centreof gravity of the helicopter.

ANTR OPS 3.620 Mass values for passengers and baggage

(a) The operator shall compute the mass of passengers and checked baggage using either the actual weighed mass of each person and the actual weighed mass of baggage or the standard mass values specified in Tables 1 to 3 below except where the number of passenger seats available is less than 6. In the case of such exceptions, passenger mass may be established by use of a verbal statement by, or on behalf of, each passenger and adding to it a pre- determined constant to account for hand baggage and clothing (See AMC OPS 3.620(a)).The procedure specifying when to select actual or standard masses and the procedure to be followed when using verbal statements must be included in the Operations Manual.

(b) If determining the actual mass by weighing, the operator must ensure that passengers' personal belongings and hand baggage are included. Such weighing must be conducted immediately prior to boarding and at an adjacent location.

(c) If determining the mass of passengers using standard mass values, the standard mass values in Tables 1, 2 and 3 below which include the mass of any infant below 2 years of age carried by an adult on one passenger seat, must be used. Infants occupying separate passenger seats must be considered as children for the purpose of this sub-paragraph.

(d) Where the total number of passenger seats available on a helicopter is 20 or more, the standard masses of male and female in Table 1 are applicable. As an alternative, in cases where the total number of passenger seats available is 30 or more, the 'All Adult' mass values in Table 1 are applicable.

Table 1

Passenger seats:	**20 and more**		**30 and more**
	Male	**Female**	**All adult**
All flights	82 kg	64 kg	78 kg
Children	35 kg	35 kg	35 kg
Hand baggage (where applicable)	6 kg		
Survival suit (where applicable)	3 kg		

(e) Where the total number of passenger seats available on a helicopter is 10 - 19 inclusive the standard masses in Table 2 are applicable.

Table 2

Passenger seats:	**10-19**	
	Male	**Female**
All flights	86 kg	68 kg
Children	35 kg	35 kg
Hand baggage (where applicable)	6 kg	
Survival suit (where applicable)	3 kg	

(f) Where the number of passenger seats available is 1 - 5 inclusive or 6 - 9 inclusive, the standard masses in Table 3 are applicable.

Table 3

Passenger seats:	**1–5**	**6–9**
Male	98 kg	90 kg
Female	80 kg	72 kg
Children	35 kg	35 kg
Hand baggage (where applicable)	6 kg	
Survival suit (where applicable)	3 kg	

(g) Where the total number of passenger seats available on the helicopter is 20 or more the standard mass value for each piece of checked baggage is 13 kg. For helicopters with 19 passenger seats or less the actual mass of checked baggage, determined by weighing, mustbe used.

(h) If the operator wishes to use standard mass values other than those contained in Tables 1 to 3 above, he must advise the BCAA of his reasons and gain its approval in advance. He must also submit for approval a detailed weighing survey plan and apply the statistical analysis method given in Appendix 1 to ANTR OPS 3.620(h). After verification and approval by the BCAA of the results of the weighing survey, the revised standard mass values are only applicable to that operator. The revised standard mass values can only be used in circumstances consistent with those under which the survey was conducted. Where revised standard masses exceed those in Tables 13, then such higher values must be used. (See IEM OPS 3.620(h).)

(i) On any flight identified as carrying a significant number of passengers whose masses, including hand baggage, are expected to exceed the standard passenger mass, the operator must determine the actual mass of such passengers by weighing or by adding an adequate mass increment. (See IEM OPS 3.620(i) & (j).)

(j) If standard mass values for checked baggage are used and a significant number of passengers check in baggage that is expected to exceed the standard baggage mass, the operator must determine the actual mass of such baggage by weighing or by adding an adequate mass increment. (See IEM OPS 3.620(i) & (j).)

(k) The operator shall ensure that a commander is advised when a non-standard method hasbeen used for determining the mass of the load and that this method is stated in the mass and balance documentation.

ANTR OPS 3.625 Mass and balance documentation

(See Appendix 1 to ANTR-OPS 3.625)

(a) The operator shall establish mass and balance documentation prior to each flight specifying the load and its distribution. The mass and balance documentation must enable the commander to determine that the load and its distribution is such that the mass and balance limits of the helicopter are not exceeded. The person preparing the mass and balance documentation must be named on the document. The person supervising the loading of the helicopter must confirm by signature that the load and its distribution are in accordance with the mass and balance documentation. This document must be acceptable to the commander, his acceptance being indicated by countersignature or equivalent. (See also ANTR OPS 3.1055(a)(12).)

(b) The operator must specify procedures for Last Minute Changes to the load.

(c) Subject to the approval of the BCAA, the operator may use an alternative to the procedures required by paragraphs (a) and (b) above.

Appendix 1 to ANTR OPS 3.605

Mass and Balance - General

(See ANTR OPS 3.605)

(a) *Determination of the dry operating mass of a helicopter*

(1) *Weighing of a helicopter*

(i) New helicopters are normally weighed at the factory and are eligible to be placed into operation without reweighing if the mass and balance records have been adjusted for alterations or modifications to the helicopter. Helicopters transferred from one Bahraini operator with an approved mass control programme to another Bahraini operator with an approved programme need not be weighed prior to use by the receiving operator unless more than 4 years have elapsed since the last weighing.

(ii) The individual mass and centre of gravity (CG) position of each helicopter shall be re-established periodically. The maximum interval between two weighings must be defined by the operator and must meet the requirements of ANTR OPS 3.605(b). In addition, the mass and the CG of each helicopter shall be re- established either by:

(A) Weighing; or

(B) Calculation, if the operator is able to provide the necessary justification to prove the validity of the method of calculation chosen,

whenever the cumulative changes to the dry operating mass exceed ± 0·5% of the maximum landing mass.

(2) *Weighing procedure*

(i) The weighing must be accomplished either by the manufacturer or by an approved maintenance organisation.

(ii) Normal precautions must be taken consistent with good practices such as:

(A) Checking for completeness of the helicopter and equipment;

(B) Determining that fluids are properly accounted for;

(C) Ensuring that the helicopter is clean; and

(D) Ensuring that weighing is accomplished in an enclosed building.

(iii) Any equipment used for weighing must be properly calibrated, zeroed, and used in accordance with the manufacturer's instructions. Each scale must be calibrated either by the manufacturer, by a civil department of weights and measures or by an appropriately authorised organisation within 2 years or withina time period defined by the manufacturer of the weighing equipment, whichever is less. The equipment must enable the mass of the helicopter to be established accurately (See IEM to Appendix 1 to ANTR OPS 3.605, sub-paragraph (a)(2)(iii)).

(b) *Special standard masses for the traffic load*. In addition to standard masses for passengers and checked baggage, the operator can submit for approval to the BCAA standard massesfor other load items.

(c) *Helicopter loading*

(1) The operator must ensure that the loading of its helicopters is performed under the supervision of qualified personnel.

(2) The operator must ensure that the loading of the freight is consistent with the data used for the calculation of the helicopter mass and balance.

(3) The operator must comply with additional structural limits such as the floor strength limitations, the maximum load per running metre, the maximum mass per cargo compartment, and/or the maximum seating limits.

(4) The operator must take account of in-flight changes in loading (e.g. CAT hoist operations).

(d) *Centre of gravity limits*

(1) *Operational CG envelope*. Unless seat allocation is applied and the effects of thenumber of passengers per seat row, of cargo in individual cargo compartments and of fuel in individual tanks is accounted for accurately in the balance calculation, operational margins must be applied to the certificated centre of gravity envelope. In determining the CG margins, possible deviations from the assumed load distribution must be considered. If free seating is applied, the operator must introduce procedures to ensure corrective action by flight or cabin crew if extreme longitudinal seat selection occurs. The CG margins and associated operational procedures, including assumptions with regard to passenger seating, must be acceptable to the BCAA. (See IEM to Appendix 1 to ANTR OPS 3.605, sub-paragraph (d).)

(2) *In-flight centre of gravity*. Further to sub-paragraph (d)(1) above, the operator must show that the procedures fully account for the extreme variation in CG travel during flight caused by passenger/crew movement and fuel consumption/transfer.

Appendix 1 to ANTR OPS 3.620(h)

Procedure for establishing revised standard mass values for passengers and baggage

(See IEM to Appendix 1 to ANTR OPS 3.620(h))

(a) *Passengers*

(1) *Weight sampling method*. The average mass of passengers and their hand baggage must be determined by weighing, taking random samples. The selection of random samples must by nature and extent be representative of the passenger volume, considering the type of operation, the frequency of flights on various routes, in/outbound flights, applicable season and seat capacity of the helicopter.

(2) *Sample size*. The survey plan must cover the weighing of at least the greatest of:

(i) A number of passengers calculated from a pilot sample, using normal statistical procedures and based on a relative confidence range (accuracy) of 1% for all adult and 2% for separate male and female average masses (the statistical procedure, complemented with a worked example for determining the minimum required sample size and the average mass, is included in IEM OPS 3.620(h)); and

(ii) For helicopters:

(A) With a passenger seating capacity of 40 or more, a total of 2000 passengers; or

(B) With a passenger seating capacity of less than 40, a total number of 50 x (the passenger seating capacity).

(3) *Passenger masses.* Passenger masses must include the mass of the passengers' belongings which are carried when entering the helicopter. When taking random samples of passenger masses, infants shall be weighed together with the accompanying adult (See also ANTR OPS 3.607(d) and ANTR OPS 3.620(c), (d) and (e)).

(4) *Weighing location*. The location for the weighing of passengers shall be selected as close as possible to the helicopter, at a point where a change in the passenger mass by disposing of or by acquiring more personal belongings is unlikely to occur before the passengers board the helicopter.

(5) *Weighing machine*. The weighing machine to be used for passenger weighing shall have a capacity of at least 150 kg. The mass shall be displayed at minimum graduations of 500 g. The weighing machine must be accurate to within 0·5% or 200g whichever is the greater.

(6) *Recording of mass values*. For each flight the mass of the passengers, thecorresponding passenger category (i.e. male/female/children) and the flight number must be recorded.

(b) *Checked baggage*. The statistical procedure for determining revised standard baggage mass values based on average baggage masses of the minimum required sample size is basically the same as for passengers and as specified in sub-paragraph (a)(1) (see also IEM OPS

3.620(h)). For baggage, the relative confidence range (accuracy) amounts to 1%. A minimum of 2000 pieces of checked baggage must be weighed.

(c) *Determination of revised standard mass values for passengers and checked baggage*

(1) To ensure that, in preference to the use of actual masses determined by weighing, the use of revised standard mass values for passengers and checked baggage does not adversely affect operational safety, a statistical analysis (see IEM OPS 3.620(h)) must be carried out. Such an analysis will generate average mass values for passengers and baggage as well as other data.

(2) On helicopters with 20 or more passenger seats, these averages apply as revised standard male and female mass values.

(3) On smaller helicopters, the following increments must be added to the average passenger mass to obtain the revised standard mass values:

Number of passenger seats	**Required mass increment**
1 – 5 incl.	16 kg
6 – 9 incl.	8 kg
10 – 19 incl.	4 kg

Alternatively, all adult revised standard (average) mass values may be applied on helicopters with 30 or more passenger seats. Revised standard (average) checked baggage mass values are applicable to helicopters with 20 or more passenger seats.

(4) Operators have the option to submit a detailed survey plan to the BCAA for approval and subsequently a deviation from the revised standard mass value provided this deviating value is determined by use of the procedure explained in this Appendix. Such deviations must be reviewed at intervals not exceeding 5 years. (See AMC to Appendix 1 to ANTR OPS 3.620(h), sub-paragraph (c)(4).)

(5) All adult revised standard mass values must be based on a male/female ratio of 80/20 in respect of all flights. If the operator wishes to obtain approval for use of a different ratio on specific routes or flights then data must be submitted to the BCAA showing that the alternative male/female ratio is conservative and covers at least 84% of the actual male/female ratios on a sample of at least 100 representative flights.

(6) The average mass values found are rounded to the nearest whole number in kg. Checked baggage mass values are rounded to the nearest 0·5 kg figure, as appropriate.

Appendix 1 to ANTR OPS 3.625

Mass and Balance Documentation

(See ANTR OPS 3.625)

(See IEM to Appendix 1 to ANTR OPS 3.625)

(a) *Mass and balance documentation*

(1) *Contents*

(i) The mass and balance documentation must contain the following information:

(A) The helicopter registration and type;

(B) The flight identification number and date;

(C) The identity of the Commander;

(D) The identity of the person who prepared the document;

(E) The dry operating mass and the corresponding CG of the helicopter;

(F) The mass of the fuel at take-off and the mass of trip fuel;

(G) The mass of consumables other than fuel;

(H) The components of the load including passengers, baggage, freight and ballast;

(I) The Take-off Mass, Landing Mass;

(J) The load distribution;

(K) The applicable helicopter CG positions; and

(L) The limiting mass and CG values.

(ii) Subject to the approval of the BCAA, the operator may omit some of this Data from the mass and balance documentation.

(2) *Last Minute Change*. If any last minute change occurs after the completion of the mass and balance documentation, this must be brought to the attention of the commander and the last minute change must be entered on the mass and balance documentation. The maximum allowed change in the number of passengers or hold load acceptable asa last minute change must be specified in the Operations Manual. If this number is exceeded, new mass and balance documentation must be prepared.

(b) *Computerised systems*. Where mass and balance documentation is generated by a computerised mass and balance system, the operator must verify the integrity of the output data. He must establish a system to check that amendments of his input data are incorporated properly in the system and that the system is operating correctly on a continuous basis by verifying the output data at intervals not exceeding 6 months.

(c) *On-board mass and balance systems*. The operator must obtain the approval of the BCAA if he wishes to use an on-board mass and balance computer system as a primary source for despatch.

(d) *Datalink*. When mass and balance documentation is sent to helicopters via datalink, a copyof the final mass and balance documentation as accepted by the commander must be available on the ground.

SUBPART K – INSTRUMENTS, EQUIPMENT AND FLIGHT DOCUMENTS

ANTR OPS 3.630 General introduction
(See IEM OPS 3.630)

(a) The operator shall ensure that a flight does not commence unless the instruments and equipment required under this Subpart are:

(1) Approved, except as specified in sub-paragraph (c), and installed in accordance with the requirements applicable to them, including the minimum performance standard and the operational and airworthiness requirements; and

(2) All helicopters on all flights. A helicopter shall be equipped with instruments that will enable the flight crew to control the flight path of the helicopter, carry out any required procedural manoeuvres and observe the operating limitations of the helicopter in the expected operating conditions. In operable condition for the kind of operation being conducted except as provided in the MEL (ANTR OPS 3.030 refers).

(b) Instruments and equipment minimum performance standards are those prescribed in the applicable Technical Standard Orders unless different performance standards are prescribed in the operational or airworthiness codes. Instruments and equipment complying with design and performance specifications on the date of OPS implementation may remain in service, or be installed, unless additional requirements are prescribed in this Subpart. Instruments and equipment that have already been approved do not need to comply with a revised TSO or a revised specification, unless a retroactive requirement is prescribed.

(c) The following items shall not be required to have an equipment approval:

(1) Electric torches referred to in ANTR OPS 3.640(a)(4);

(2) An accurate time piece referred to in ANTR OPS 3.650(b) & 3.652(b);

(3) Chart holder referred to in ANTR OPS 3.652(n).

(4) First aid kits referred to in ANTR OPS 3.745;

(5) Megaphones referred to in ANTR OPS 3.810;

(6) Survival and pyrotechnic signalling equipment referred to in ANTR OPS 3.835(a) and (c); and

(7) Sea anchors and equipment for mooring, anchoring or manoeuvring amphibians on water referred to in ANTR OPS 3.840.

(d) If equipment is to be used by one flight crew member at his station during flight, it must be readily operable from his station. When a single item of equipment is required to be operated by more than one flight crew member it must be installed so that the equipment is readily operable from any station at which the equipment is required to be operated.

(e) Those instruments that are used by any one flight crew member shall be so arranged as to permit the flight crew member to see the indications readily from his station, with the minimum practicable deviation from the position and line of vision which he normallyassumes when looking forward along the flight path. Whenever a single instrument is required in a helicopter operated by more than 1 flight crew member it must be installed so that the instrument is visible from each applicable flight crew station.

(f) A helicopter which has a maximum certificated take-off mass in excess of 3 175 kg or a maximum passenger seating configuration of more than 9 should be equipped with a vibration health monitoring system.

ANTR OPS 3.635 *Intentionally blank*

ANTR OPS 3.640 Helicopter operating lights

The operator shall not operate a helicopter unless it is equipped with:

(a) For flight by day under VFR:

(1) Anti-collision light system;

(b) For flight under IFR or by night, in addition to equipment specified in subparagraph (a) above:

(1) Lighting supplied from the helicopter's electrical system to provide adequate illumination for all instruments and equipment essential to the safe operation of the helicopter; and

(2) Lighting supplied from the helicopter's electrical system to provide illumination in all passenger compartments; and

(3) An electric torch for each required crew member readily accessible to crew members when seated at their designated station; and

(4) Navigation/position lights; and

(5) Two landing lights of which at least one is adjustable in flight so as to illuminate the ground in front of and below the helicopter and the ground on either side of the helicopter; and

(6) Lights to conform with the International regulations for preventing collisions at sea if the helicopter is amphibious.

ANTR OPS 3.645 *Intentionally blank*

ANTR OPS 3.647 Equipment for operations requiring a radio communication and/or radio navigation system

(See IEM OPS 3.647)

Whenever a radio communication and/or radio navigation system is required, the operator shall not conduct operations unless the helicopter is equipped with a headset with boom microphone or equivalent and a transmit button on the flight controls for each required pilot and/or crew member at his working station.

ANTR OPS 3.650 Day VFR operations – Flight and navigational instruments and associated equipment

(See AMC OPS 3.650/3.652)
(See IEM OPS 3.650/3.652)

The operator shall not operate a helicopter by day in accordance with Visual Flight Rules (VFR) unless it is equipped with the flight and navigational instruments and associated equipment and, where applicable, under the conditions stated in the following sub-paragraphs:

(a) A magnetic compass;

(b) An accurate time-piece showing the time in hours, minutes, and seconds;

(c) A sensitive pressure altimeter calibrated in feet with a sub-scale setting, calibrated in hectopascals/millibars, adjustable for any barometric pressure likely to be set during flight;

(d) An airspeed indicator calibrated in knots;

(e) A vertical speed indicator;

(f) A slip indicator;

(g) A means of indicating on the flight deck the outside air temperature calibrated in degrees Celcius (see AMC OPS 3.650(g) & 3.652(k).)

(h) Whenever two pilots are required the second pilot's station shall have separate instruments as follows:

 (1) A sensitive pressure altimeter calibrated in feet with a sub-scale setting calibrated in hectopascals/millibars, adjustable for any barometric pressure likely to be set during flight;

 (2) An airspeed indicator calibrated in knots;

 (3) A vertical speed indicator; and

 (4) A slip indicator.

(i) In addition to the flight and navigational equipment required by sub-paragraphs (a) to (h) above, helicopters with a maximum certificated take-off mass (MCTOM) over 3 175 kg or any helicopter operating over water when out of sight of land or when the visibility is less than 1 500m, must be equipped with the following flight instruments:

 (1) An attitude indicator; and

 (2) A gyroscopic direction indicator.

(j) Whenever duplicate instruments are required, the requirement embraces separate displays for each pilot and separate selectors or other associated equipment where appropriate;

(k) All helicopters must be equipped with means for indicating when power is not adequately supplied to the required flight instruments; and

(l) Each airspeed indicating system must be equipped with a heated pitot tube or equivalent means for preventing malfunction due to either condensation or icing for helicopters with a maximum certificated take-off mass (MCTOM) over 3 175 kg or having a maximum approved passenger seating configuration (MAPSC) of more than 9.

(m) such additional instruments or equipment as may be prescribed by the BCAA.

ANTR OPS 3.652 IFR or night operations – Flight and navigational instruments and associated equipment

(See AMC OPS 3.650/3.652)
(See IEM OPS 3.650/3.652)

The operator shall not operate a helicopter in accordance with Instrument Flight Rules (IFR) or by night in accordance with Visual Flight Rules (VFR) unless it is equipped with the flight and navigational instruments and associated equipment and, where applicable, under the conditions stated in thefollowing sub-paragraphs:

(a) A magnetic compass;

(b) An accurate time-piece showing the time in hours, minutes and seconds;

(c) Two sensitive pressure altimeters calibrated in feet, with sub-scale settings calibrated in hectopascals/millibars, adjustable for any barometric pressure likely to be set during flight. For single pilot night VFR operations one pressure altimeter may be substituted by a radio altimeter.

(d) An airspeed indicating system with heated pitot tube or equivalent means for preventing malfunctioning due to either condensation or icing including an annunciation of pitot heater failure. The pitot heater failure annunciation requirement does not apply to those helicopters with a maximum approved passenger seating configuration (MAPSC) of 9 or less or a maximum certificated take-off mass (MCTOM) of 3 175 kg or less and issued with an individual Certificate of Airworthiness prior to 1 August 1999 (see AMC OPS 3.652(d) & (m)(2));

(e) A vertical speed indicator;

(f) A slip indicator;

(g) An attitude indicator;

(h) A single standby attitude indicator (artificial horizon) capable of being used from eitherpilot's station that:

   (1) Provides reliable operation for a minimum of 30 minutes or the time required to fly to a suitable alternate landing site when operating over hostile terrain or offshore, whichever is the greater, after total failure of the normal electrical generating system, taking into account other loads on the emergency power supply and operational procedures;

   (2) Operates independently of any other attitude indicating system;

   (3) Is operative automatically after total failure of the normal electrical generating system; and

   (4) Is appropriately illuminated during all phases of operation;

(i) In complying with sub-paragraph (h) above, it must be clearly evident to the flight crew when the standby attitude indicator, required by that paragraph, is being operated by emergency power. Where the standby attitude indicator has its own dedicated power supply there shall be an associated indication clearly visible when this supply is in use.

(j) A gyroscopic direction indicator for VFR night and a magnetic gyroscopic direction indicator for IFR.;

(k) A means of indicating on the flight deck the outside air temperature calibrated in degrees Celsius (see AMC OPS 3.650(g) and 3.652(k)); and

(l) An alternate source of static pressure for the altimeter and the airspeed and vertical speed indicators; and

(m) Whenever two pilots are required the second pilot's station shall have separate instruments as follows:

(1) A sensitive pressure altimeter calibrated in feet with a sub-scale setting, calibrated in hectopascals/millibars, adjustable for any barometric pressure setting likely to be encountered during flight which may be one of the two altimeters required by sub-paragraph (c) above;

(2) An airspeed indicating system with heated pitot tube or equivalent means for preventing malfunctioning due to either condensation or icing including an annunciation of pitot heater failure. The pitot heater failure annunciation requirement does not apply to those helicopters with a maximum approved passenger seating configuration (MAPSC) of 9 or less or a maximum certificated take-off mass (MCTOM) of 3 175 kg or less and issued with an individual Certificate of Airworthiness prior to 1 August 1999 (see AMC OPS 3.652(d) and (m)(2));

(3) A vertical speed indicator;

(4) A slip indicator;

(5) An attitude indicator; and

(6) A gyroscopic direction indicator for VFR night and a magnetic gyroscopic direction indicator for IFR.

(n) For IFR operations, a chart holder in an easily readable position which can be illuminated for night operations.

(o) Whenever duplicate instruments are required, the requirement embraces separate displays for each pilot and separate selectors or other associated equipment where appropriate; and

(p) All helicopters must be equipped with means for indicating when power is not adequately supplied to the required flight instruments.

(q) Where helicopters are equipped with automatic landing systems, HUD or equivalent displays, EVS, SVS or CVS, or any combination of those systems into a hybrid system, the use of such systems for the safe operation of a helicopter shall be approved by the BCAA (see ANTR OPS 3.785).

(r) a stabilization system, unless it has been demonstrated to the satisfaction of the certificating authority that the helicopter possesses, by nature of its design, adequate stability without such a system;

(s) such additional instruments or equipment as may be prescribed by the BCAA.

ANTR OPS 3.655 Additional equipment for single pilot operation under IFR
(See AMC OPS 3.655)

The operator shall not conduct single pilot IFR operations unless the helicopter is equipped with an autopilot with, at least, altitude hold and heading mode, except for helicopters with a maximum approved passenger seating configuration (MAPSC) of 6 or less first certificated for single pilot IMC operations on or before 1 January 1979.

ANTR OPS 3.660 Radio Altimeters

(a) The operator shall not operate a helicopter on a flight over water;

(1) when operating out of sight of the land; or

(2) when the visibility is less than 1 500 m; or

(3) at night; or

(4) at a distance from land corresponding to more than 3 minutes at normal cruising speed,

unless that helicopter is equipped with a radio altimeter with an audio voice warning, or other means acceptable to the BCAA, operating below a preset height and a visual warning capable of operating at a height selectable by the pilot.

ANTR OPS 3.665 ~~*Intentionally Blank*~~

A helicopter when operating in accordance with IFR and which has a maximum certificated take-off mass in excess of 3 175 kg, or a maximum passenger seating configuration of more than 9, should be equipped with a ground proximity warning system which has a forward-looking terrain avoidance function.

ANTR OPS 3.670 Airborne Weather Radar Equipment

The operator shall not operate a helicopter with a maximum approved passenger seating configuration (MAPSC) of more than 9 under IFR or at night when current weather reports indicate that thunderstorms or other potentially hazardous weather conditions, regarded as detectable with airborne weather radar, may reasonably be expected along the route to be flown unless it is equipped with airborne weather radar equipment.

ANTR OPS 3.675 Equipment for operations in icing conditions

(a) The operator shall not operate a helicopter in expected or actual icing conditions unless it is certificated and equipped to operate in icing conditions.

(b) The operator shall not operate a helicopter in expected or actual icing conditions at night unless it is equipped with a means to illuminate or detect the formation of ice. Any illumination that is used must be of a type that will not cause glare or reflection that would handicap crew members in the performance of their duties.

ANTR OPS 3.680 *Intentionally blank*

ANTR OPS 3.685 Flight crew interphone system

The operator shall not operate a helicopter on which a flight crew of more than one is required unless it is equipped with a flight crew interphone system, including headsets and microphones, not of a handheld type, for use by all members of the flight crew.

ANTR OPS 3.690 Crew member interphone system

(a) The operator shall not operate a helicopter carrying a crew member other than a flight crew member unless it is equipped with a crew member interphone system.

(b) The crew member interphone system required by this paragraph must:

(1) Operate independently of the public address system except for handsets, headsets, microphones, selector switches and signalling devices;

(2) Provide a means of two-way communication between the flight crew compartment and each crew member station;

(3) Be readily accessible for use from each of the required flight crew stations in the flight crew compartment;

and in addition for cabin crew members:

(4) Be readily accessible for use at required cabin crew stations close to each separate or pair of floor level emergency exits;

(5) Have an alerting system incorporating aural or visual signals for use by flight crew members to alert the cabin crew and for use by cabin crew members to alert the flight crew; and

(6) Have a means for the recipient of a call to determine whether it is a normal call or an emergency call (See AMC OPS 3.690(b)(6)).

ANTR OPS 3.695 Public address system

(a) Except as in (c) below, the operator shall not operate a helicopter with a maximum approved passenger seating configuration (MAPSC) of more than 9 unless a public address system is installed.

(b) The public address system required by this paragraph must:

(1) Operate independently of the interphone systems except for handsets, headsets, microphones, selector switches and signalling devices;

(2) Be readily accessible for immediate use from each required flight crew member station;

(3) Be readily accessible for use from at least one cabin crew member station in the cabin, and each public address system microphone intended for cabin crew use must be positioned adjacent to a cabin crew member seat that is located near each requiredfloor level emergency exit in the passenger compartment;

(4) Be capable of operation within 10 seconds by a cabin crew member at each of those stations in the compartment from which its use is accessible;

(5) Be audible and intelligible at all passenger seats, toilets and cabin crew seats andwork stations; and

(6) Following a total failure of the normal electrical generating system, provide reliable operation for a minimum of 10 minutes.

(c) For helicopters with a maximum approved passenger seating configuration (MAPSC) of more than 9 but less than 19, the Public Address System is not required if:

(1) the helicopter is designed without a bulkhead between pilot and passengers; and

(2) the operator is able to demonstrate that when in flight, the pilot's voice is audible and intelligible at all passengers seats.

ANTR OPS 3.700 Flight Recorders - General
(See IEM OPS 3.700)

(a) Crash protected flight recorders comprise one or more of the following systems: a flightdata recorder (FDR), a cockpit voice recorder (CVR), an airborne image recorder (AIR) and/or a data link recorder (DLR). Image and data link information may be recorded on either the CVR or the FDR.

(b) Combination recorders (FDR/CVR) may be used to meet the flight recorder equipage requirements given in this ANTR OPS 3 / ICAO Annex 6, Part – III.

~~*Note 1: For helicopters for which the application for type certification is submitted to a Contracting State before 1 January 2016, specifications applicable to crash-protected flight recorders may be found in EUROCAE ED-112, ED-56A, ED-55, Minimum Operational Performance Specifications (MOPS), or earlier equivalent documents.*~~

~~*Note 2: For helicopters for which the application for type certification is submitted to a Contracting State on or after 1 January 2016, specifications applicable to crash-protected flight recorders may be found in EUROCAE ED-112A, Minimum Operational Performance Specification (MOPS), or equivalent documents.*~~

~~*Note 3: Specifications applicable to lightweight flight recorders may be found in EUROCAE ED-155, Minimum Operational Performance Specification (MOPS), or equivalent documents.*~~

~~*Note 4: As of 7 November 2019, Chapter 1 contains requirements for States regarding the use of voice, image and/or data recordings and transcripts.*~~

(a) Lightweight flight recorders comprise one or more of the following: an aircraft data recording system (ADRS), a cockpit audio recording system (CARS), an airborne image recording system (AIRS), a data link recording system (DLRS). Image and data link information may be recorded on either the CARS or the ADRS.

Note 1: For helicopters for which the application for type certification is submitted to a Contracting State before 1 January 2016, specifications applicable to crash-protected flight recorders may be found in EUROCAE ED-112, ED-56A, ED-55, Minimum Operational Performance Specifications (MOPS), or earlier equivalent documents.

Note 2: For helicopters for which the application for type certification is submitted to a Contracting State on or after 1 January 2016, specifications applicable to crash-protected flight recorders may be found in EUROCAE ED-112A, Minimum Operational Performance Specification (MOPS), or equivalent documents.

Note 3: Specifications applicable to lightweight flight recorders may be found in EUROCAE ED-155, Minimum Operational Performance Specification (MOPS), or equivalent documents.

(b) Non-deployable flight recorder containers shall:

(i) be painted a distinctive orange or yellow colour;

(ii) carry reflective material to facilitate their location; and

(iii) have securely attached an automatically activated underwater locating device operating at a frequency of 37.5kHz and, by no later than 1 January 2018, be capable of operating for a minimum of 90 days.

(c) Automatic deployable flight recorder containers shall:

(i) be painted a distinctive orange colour, however the surface visible from outside the aircraft may be of another colour;

(ii) carry reflective material to facilitate their location; and

(iii) have an integrated automatically activated ELT.

(d) The flight recorder systems shall be installed so that:

(i) the probability of damage to the recordings is minimized;

(ii) there is an aural or visual means for pre-flight checking that the flight recorder systems are operating properly; and

(iii) if the flight recorder systems have a bulk erasure device, the installation shall be designed to prevent operation of the device during flight time or crash impact and

(iv) helicopters for which the individual certificate of airworthiness is first issued on or after 1 January 2023, a flight crew-operated erase function shall be provided on the flight deck which, when activated, modifies the recording of a CVR and AIR so that it cannot be retrieved using normal replay or copying techniques. The installation shall be designed to prevent activation during flight. In addition, the probability of an inadvertent activation of an erase function during an accident shall also be minimized.

Note: The erase function is intended to prevent access to CVR and AIR recordings by normal replay or copying means, but would not prevent accident investigation authorities access to such recordings by specialized replay or copying techniques.

(e) The flight recorder systems shall be installed so that they receive electrical power from a bus that provides the maximum reliability for operation of the flight recorder systems without jeopardizing service to essential or emergency loads.

(f) The lightweight flight recorders shall be connected to a power source having the characteristics which ensure proper

(g) and reliable recording in the operational environment.

(h) The flight recorder systems, when tested by methods approved by the appropriate certificating authority, shall be demonstrated to be suitable for the environmental extremes over which they are designed to operate.

(i) Means shall be provided for an accurate time correlation between the flight recorder systems recordings.

(j) The flight recorder system manufacturer usually shall provide the appropriate certificating authority with the following information in respect of the flight recording systems:

(i) manufacturer's operating instructions, equipment limitations and installation procedures;

(ii) parameter origin or source and equations which relate counts to units of measurement; and

(iii) manufacturer's test reports; and

(iv) detailed information to ensure the continued serviceability of the flight recorder system.

(k) The holder of the airworthiness approval for the installation design of the flight recorder system shall make available the relevant continuing airworthiness information to the operator of the helicopter to be incorporated in the continuing airworthiness maintenance programme. This continuing airworthiness information shall cover in detail all the tasks required to ensure the continued serviceability of the flight recorder system.

Note 1: The flight recorder system is composed of the flight recorder as well as any dedicated sensors, hardware and software that provide information required per this ANTR.

Note 2: Conditions related to the continued serviceability of a flight recorder system are defined in Section 6 of this Appendix. The Manual on Flight Recorder System Maintenance (FRSM) (Doc 10104) provides guidance on maintenance tasks associated with flight recorder systems.

(l) Operation

(1) Flight recorders shall not be switched off during flight time.

(2) To preserve cockpit voice recorder records, cockpit voice recorder shall be deactivated upon completion of flight time following an accident or incident. The flight recorders shall not be reactivated before their disposition as determined in accordance withANTR Part VI – Aircraft Accident and Incident Investigation, chapter 3, paragraph 3.2.2.4.

Note 1: The need for removal of the cockpit voice recorder records from the aircraft willbe determined by the investigation authority in the State conducting the investigation with due regard to the seriousness of an occurrence and the circumstances, including the impact on the operation.

Note 2: The operator shall ensure, to the extent possible, in the event the helicopter becomes involved in an accident or incident, the preservation of all related cockpit voice recorder records and, if necessary, the associated flight recorders, and their retention in safe custody pending their disposition as determined in accordance with ANTR Part VI, chapter 3, paragraph 3.2.2.4.

(m) Continued Serviceability

Operational checks and evaluations of recordings from the flight recorder systems shall be conducted to ensure the continued serviceability of the recorders.

Note: Procedures for the inspections of the flight recorder systems are given in Appendix I to ANTR OPS 3.700.

(n) Flight recorder electronic documentation

The documentation requirement concerning FDR and ADRS parameters provided by operators to accident investigation authorities shall be in an electronic format, acceptable to the accident investigation authority, and take account of industry specifications.

Note: Industry specification for documentation concerning flight recorder parameters may be found in the Specification of Aeronautical Radio Incorporated, ARINC 647A, Flight Recorder Electronic Documentation, or equivalent document.

ANTR OPS 3.705 Flight Data Recorders and Aircraft Data Recording Systems
(See Appendix 1 to ANTR OPS 3.705)

(a) Applicability

(1) All helicopters of a maximum certificated take-off mass of over 3175 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2016 shall be equipped with an FDR which shall record at least the first 48 parameters listed in Table 1 of Appendix 1 to ANTR OPS 3.705.

(2) All helicopters of a maximum certified take-off mass over 7000 kg, or having a passenger seating configuration of more than nineteen, for which the individual certificate of airworthiness is first issued on or after 1 January 1989 shall be equipped with an FDR which shall record at least the first 30 parameters listed in Table 1 of Appendix 1 to ANTR OPS 3.705.

(3) All helicopters of a maximum certificated take-off mass over 3175 kg, up to and including 7 000 kg, for which the individual certificate of airworthiness is first issued on or after 1 January 1989 shall be equipped with an FDR which shall record at least the first 15 parameters listed in Table 1 of Appendix 1 to ANTR OPS 3.705.

(4) All turbine-engined helicopters of a maximum certificated take-off mass of over 2 250 kg, up to and including 3 175 kg for which the application for type certification was submitted to a Contracting State on or after 1 January 2018 shall be equipped with:

(a) an FDR which shall record at least the first 48 parameters listed in Table 1 of Appendix 1 to ANTR OPS 3.705 or

(b) a Class C AIR at least the flight path and speed parameters displayed to the pilot(s), as defined in Table 2 of Appendix 1 to ANTR OPS 3.705; or

(c) an ADRS which shall record the first 7 parameters listed in Table 2 of Appendix 1 to ANTR OPS 3.705.

Note 1: "The application for type certification is submitted to a Contracting State" refers to the date of application for the original "Type Certificate" for the helicopter type andnot the date of certification of particular helicopter variants or derivative models.

(5) All helicopters of a maximum certificated take-off mass of 3175 kg or less for which the individual certificate of airworthiness is first issued on or after 1 January 2018 should be equipped with:

(a) an FDR which should record at least the first 48 parameters listed in Table 1 of Appendix 1 to ANTR OPS 3.705; or

(b) a Class C AIR or AIRS which should record at least the flight path and speed parameters displayed to the pilot(s), as defined in Table 2 of Appendix 1 to ANTR OPS 3.705; or

(c) an ADRS which should record the first 7 parameters listed in Table 1 of Appendix 2 to ANTR OPS 3.705.

(6) All helicopters of a maximum certificated take-off mass of over 3 175 kg for which the application for type certificate is submitted to a Contracting State on or after 1 January 2023 shall be equipped with an FDR capable of recording at least the first 53 parameters listed in Table 1 of Appendix 1 to ANTR OPS 3.705.

(7) All helicopters of a maximum certificated take-off mass of over 3 175 kg for which the

individual certificate of airworthiness is first issued on or after 1 January 2023 should be equipped with an FDR capable of recording at least the first 53 parameters listed in Table Table 1 of Appendix 1 to ANTR OPS 3.705.

(b) Recording technology

FDRs, ADRS, AIRs or AIRS shall not use engraving metal foil, frequency modulation (FM), photographic film or magnetic tape.

(c) Duration

All FDRs shall retain the information recorded during at least the last 10 hours of their operation.

ANTR OPS 3.710 Cockpit Voice Recorder and Cockpit Audio Recording Systems

(a) All helicopters of a maximum certificated take-off mass of over 7 000 kg shall be equipped with a CVR. For helicopters not equipped with an FDR, at least main rotor speed shall be recorded on the CVR.

(b) All helicopters of a maximum certificated take-off mass of over 3 175 kg for which the individual certificate of airworthiness is first issued on or after 1 January 1987 should be equipped with a CVR. For helicopters not equipped with an FDR, at least main rotor speed should be recorded on the CVR.

(c) Recording technology

CVRs and CARS shall not use magnetic tape or wire.

(d) Duration

All helicopters required to be equipped with a CVR, shall be equipped with a CVR which shall retain the information recorded during at least the last two hours of its operation.

ANTR OPS 3.715 Data Link Recorders

(a) Applicability

(1) All helicopters for which the certificate of airworthiness is first issued on or after 1 January 2016, which utilize any of the data link communications applications listed in Appendix 1 of ANTR OPS 3.715 and are required to carry a CVR, shall record on a crash-protected flight recorder the data link communications messages.

(2) All helicopters which are modified on or after 1 January 2016 to install and utilize any of the data link communications applications listed in Appendix 1 of ANTR OPS 3.715 and are required to carry a CVR shall record on a crash-protected flight recorder the data link communications messages.

Note: A Class B AIR could be a means for recording data link communications applications messages to and from the helicopter where it is not practical or is prohibitively expensive to record those data link communications applications messages on FDR or CVR.

(b) Duration

The minimum recording duration shall be equal to the duration of the CVR.

(c) Correlation

Data link recording shall be able to be correlated to the recorded cockpit audio.

ANTR OPS 3.727 *Intentionally blank*

ANTR OPS 3.728 *Intentionally blank*

ANTR OPS 3.730 Seats, seat safety belts, harnesses and child restraint devices

(a) The operator shall not operate a helicopter unless it is equipped with:

(1) A seat or berth for each person who is aged two years or more;

(2) For helicopters first issued with an individual Certificate of Airworthiness, up to and including 31 July 1999 a safety belt, with or without a diagonal shoulder strap, or a safety harness for use in each passenger seat for each passenger aged two years ormore;

(3) For helicopters first issued with an individual Certificate of Airworthiness, on or after 1 August 1999, a safety belt, with a diagonal shoulder strap, or a safety harness for use in each passenger seat for each passenger aged 2 years or more;

(4) A restraint device for each passenger less than 2 years of age;

(5) A safety harness for each flight crew seat incorporating a device which will automatically restrain the occupant's torso in the event of rapid deceleration; and

(6) A safety harness for each cabin crew member's seat.

Note: This requirement does not preclude use of passenger seats by cabin crew members carried in excess of the required cabin crew complement.

(7) Seats for cabin crew members located, where possible, near a floor level emergency exit. If the number of required cabin crew members exceeds the number of floor level emergency exits the additional cabin crew seats required shall be located such that the cabin crew member(s) may best be able to assist passengers in the event of an emergency evacuation. Such seats shall be forward or rearward facing within 15° of the longitudinal axis of the helicopter.

(b) All safety harnesses and safety belts must have a single point release. A safety belt with a diagonal shoulder strap is permitted if it is not reasonably practicable to fit the latter.

ANTR OPS 3.731 Fasten Seat belt and No- Smoking signs

The operator shall not operate a helicopter in which all passenger seats are not visible from the commander’s seat, or from the seat of the pilot to whom the conduct of the flight may be delegated, unless it is equipped with a means of indicating to all passengers and cabin crew when seat belts shall be fastened and when smoking is not allowed.

ANTR OPS 3.735 *Intentionally blank*

ANTR OPS 3.740 Placards

(See IEM OPS 3.740)

The operator shall not operate a helicopter unless the following placards are installed;

(a) Every exit from the aircraft shall be marked with the words "Exit" or "Emergency Exit' in capital letters, and in both English and Arabic script.

(b) Every exit from the aircraft shall be marked with instructions in English and Arabic to indicate the correct method of opening the exit.

(c) The markings shall be placed on or near the inside surface of the door or other closure of the exit and, if it is operable, from the outside of the aircraft on or near the exterior surface.

(d) The location instructions for all emergency equipment required to be located by a passenger shall be in English and Arabic.

ANTR OPS 3.745 First-Aid Kits
(See AMC OPS 3.745)

(a) The operator shall not operate a helicopter unless it is equipped with a first-aid kit, readily accessible for use.

(b) The operator shall ensure that first-aid kits are:

(1) Inspected periodically to confirm, to the extent possible, that contents are maintained in the condition necessary for their intended use; and

(2) Replenished at regular intervals, in accordance with instructions contained on their labels, or as circumstances warrant.

ANTR OPS 3.750 Universal Precaution Kit
(See AMC OPS 3.750)

Helicopters which are required to carry at least one cabin crew member as part of the operating crew, should have one universal precaution kit for the use of cabin crew members in managing incidents of ill health associated with a case of suspected communicable disease, or in the case of illness involving contact with body fluids, such as blood, urine, vomit and feces and to protect the cabin crew members who are assisting potentially infectious cases of suspected communicable disease.

ANTR OPS 3.755 *Intentionally blank*

ANTR OPS 3.760 *Intentionally blank*

ANTR OPS 3.765 Electronic Flight Bags (EFBs)

(a) EFB equipment

Where portable EFBs are used on board a helicopter, the operator shall ensure that they do not affect the performance of the helicopters systems, equipment or the ability to operate the helicopter.

(b) EFB functions

Where EFBs are used on board a helicopter the operator shall:

(1) assess the safety risk(s) associated with each EFB function;

(2) establish and document the procedures for the use of, and training requirements for, the device and each EFB function; and

(3) ensure that, in the event of an EFB failure, sufficient information is readily available to the flight crew for the flight to be conducted safely.

(4) the BCAA shall approve the operational use of EFB functions to be used for the safe operation of helicopters.

(c) EFB operational approval

In approving the use of EFBs, the BCAA shall ensure that:

(1) the EFB equipment and its associated installation hardware, including interaction with helicopter systems if applicable, meet the appropriate airworthiness certification requirements;

(2) the operator has assessed the safety risks associated with the operations supported by the EFB function(s);

(3) the operator has established requirements for redundancy of the information (if appropriate) contained in and displayed by the EFB function(s);

(4) the operator has established and documented procedures for the management of the EFB function(s) including any database it may use; and

(5) the operator has established and documented the procedures for the use of, and training requirements for, the EFB and the EFB function(s).

Note 1: Guidance on EFB equipment, functions and operational approval is contained in CAP 07-Electronic Flight Bag (EFB), the Manual on Electronic Flight Bags (ICAO Doc 10020) and EASA AMC 20-25.

Note 2: Guidance on safety risk assessments is contained in the Safety Management Manual (SMM) (ICAO Doc 9859).

ANTR OPS 3.770 Supplemental Oxygen for Pressurised Helicopters

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

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

(a) A helicopter intended to be operated at flight altitudes greater than 10 000 ft pressure altitude in personnel compartments shall be equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies.

(b) A helicopter intended to be operated at flight altitudes greater than 10 000 ft pressure altitude but which is provided with means of maintaining pressure altitudes less than 10 000 ft pressure altitude in personnel compartments shall be provided with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies.

(c) A helicopter, intended to be operated at flight altitudes greater than 25 000 ft pressure altitude, which cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to a pressure altitude of 13 000 ft, shall be provided with automatically deployable oxygen equipment. The total number of oxygen dispensing units shall exceed the number of passenger and cabin crew seats by at least 10 per cent.

(d) A flight to be operated with a pressurised helicopter shall not be commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all the crew members and passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurisation, for any period that the atmospheric pressure in any compartment occupied by them would be less than 10 000 ft pressure altitude. In addition, when the helicopter is operated at flight altitudes at which the atmospheric pressure is more than 25 000 ft pressure altitude and cannot descend safely to a flight altitude at which the atmospheric pressure is equal to 13 000 ft pressure altitude within four minutes, there shall be no less than a 10-minute supply for the occupants of the passenger compartment.

ANTR OPS 3.772 Safeguarding of cabin crew and passengers in pressurised helicopters in the event of loss of pressurisation

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

(b) Passengers shall be safeguarded by such devices or operational procedures as will ensure reasonable probability of their surviving the effects of hypoxia in the event of loss of pressurisation.

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

ANTR OPS 3.775 Supplemental oxygen - Non-pressurised helicopters
(See Appendix 1 to ANTR OPS 3.775)

(a) *General*

(1) The operator shall not operate a non-pressurised helicopter at pressure altitudes above 10 000 ft unless supplemental oxygen equipment, capable of storing and dispensing the oxygen supplies required, is provided.

(2) The amount of supplemental oxygen for sustenance required for a particular operation shall be determined on the basis of flight altitudes and flight duration, consistent with the operating procedures established for each operation in the Operations Manual and with the routes to be flown, and with the emergency procedures specified in the Operations Manual.

(3) A helicopter intended to be operated above 10 000 ft pressure altitude shall be provided with equipment capable of storing and dispensing the oxygen supplies required.

(b) *Oxygen supply requirements*

(1) *Flight crew members*. Each member of the flight crew on duty in the cockpit shall be supplied with supplemental oxygen in accordance with Appendix 1. If all occupants of cockpit seats are supplied from the flight crew source of oxygen supply, then they shall

be considered as flight crew members on cockpit duty for the purpose of oxygen supply.

(2) *Cabin crew members, additional crew members and passengers*. Cabin crew members and passengers shall be supplied with oxygen in accordance with Appendix 1. Cabin crew members carried in addition to the minimum number of cabin crew members required, and additional crew members, shall be considered as passengers for the purpose of oxygen supply.

ANTR OPS 3.785 Automatic Landing Systems, a Head Up Display (HUD) or Equivalent Displays, Enhanced Vision Systems (EVS), Synthetic Vision Systems (SVS) and/or Combined Vision Systems (CVS)

(See Appendix 1 to ANTR OPS 3.785 HUD, VS or Equivalent)

Notwithstanding the requirement at ANTR OPS 3.430(d) & (e), the operator shall not operate a helicopter equipped with automatic landing systems, a head-up display (HUD) or equivalent displays, enhanced vision systems (EVS), synthetic vision systems (SVS) and/or combined vision systems (CVS) or any combination of those systems, unless criteria for the use of such systems for the safe operation of a helicopter is established by the operator and approved by BCAA for the operational use of such displays.

The criteria for the use of such systems for the safe operation of a helicopter as described in Appendix 1 to ANTR OPS 3.785 HUD, VS or Equivalent is complied with as applicable.

Note 1: Information regarding automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS is contained in the Manual of All-Weather Operations (ICAO DOC 9365)

Note 2: Automatic landing system – helicopter is an automatic approach using airborne systems which provide automatic control of the flight path, to a point aligned with the landing surface, from which the pilot can transition to a safe landing by means of natural vision without the use of automatic control.

ANTR OPS 3.790 Hand fire extinguishers

(See AMC OPS 3.790)

The operator shall not operate a helicopter unless hand fire extinguishers are provided for use in crew, passenger and, as applicable, cargo compartments and galleys in accordance with the following:

(a) The type and quantity of extinguishing agent must be suitable for the kinds of fires likely to occur in the compartment where the extinguisher is intended to be used and, for personnel compartments, must minimise the hazard of toxic gas concentration;

(b) At least one hand fire extinguisher, containing Halon 1211 (bromochlorodifluoro-methane, $CBrClF_2$), or equivalent as the extinguishing agent, must be conveniently located in the cockpit for use by the flight crew;

(c) At least one hand fire extinguisher must be located in, or readily accessible for use in, each galley not located on the main passenger deck;

(d) At least one readily accessible hand fire extinguisher must be available for use in each cargo compartment which is accessible to crew members during flight for the purpose of fire fighting; and

(e) There must be at least the following number of hand fire extinguishers conveniently located to provide adequate availability for use in each passenger compartment.

Passenger compartment seating capacity	**Minimum number of Hand Fire Extinguishers**
7 to 30	1
31 to 60	2
61 to 200	3

ANTR OPS 3.795 Built-in Lavatory Fire Extinguisher

Any agent used in a built-in fire extinguisher for each lavatory disposal receptacle for towels, paper or waste in a helicopter for which the individual certificate of airworthiness is first issued on or after 31 December 2011 and any extinguishing agent used in a portable fire extinguisher in a helicopter for which the individual certificate of airworthiness is first issued on or after 31 December 2018 shall:

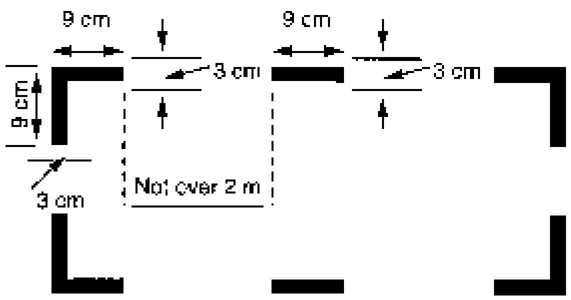
(a) meet the applicable minimum performance requirements of the State of Registry; and

(b) not be of a type listed in the 1987 *Montreal Protocol on Substances that Deplete the Ozone Layer* as it appears in the Eighth Edition of the *Handbook for the Montreal Protocol on Substances that Deplete the Ozone La*yer, Annex A, Group II.

Note: Information concerning extinguishing agents is contained in the UNEP Halons Technical Options Committee Technical Note No. 1 – New Technology Halon Alternatives and FAA Report No. DOT/FAA/AR-99-63, Options to the Use of Halons for Aircraft Fire Suppression Systems.

ANTR OPS 3.800 Marking of break-in points

The operator shall ensure that, if areas of the fuselage suitable for break-in by rescue crews in emergency are available on a helicopter, such areas shall be marked as shown below. The colour of the markings shall be red or yellow, and if necessary they shall be outlined in white to contrast with the background. If the corner markings are more than 2 metres apart, intermediate lines 9 cm x 3 cm sh allbe inserted so that there is no more than 2 metres between adjacent marks.



ANTR OPS 3.805 *Intentionally Blank*

ANTR OPS 3.810 Megaphones
(See AMC OPS 3.810)

The operator shall not operate a helicopter with a total maximum approved passenger seating configuration (MAPSC) of more than 19 unless it is equipped with portable battery-powered megaphones readily available for use by crew members during an emergency evacuation.

ANTR OPS 3.815 Emergency lighting

(a) The operator shall not operate a helicopter which has a maximum approved passenger seating configuration (MAPSC) of more than 19 unless it is equipped with:

(1) An emergency lighting system having an independent power supply to provide a source of general cabin illumination to facilitate the evacuation of the helicopter; and

(2) Illuminated emergency exit marking and locating signs.

ANTR OPS 3.820 Automatic Emergency Locator Transmitter
(See IEM OPS 3.820)

(a) The operator shall not operate a helicopter unless it is equipped with an automatic Emergency Locator Transmitter (ELT).

(b) The operator shall not operate a helicopter in Performance Class 1 or 2 on a flight over water in a hostile environment as defined in ANTR OPS 3.480(a)(12)(ii)(A) at a distance from land corresponding to more than 10 minutes flying time at normal cruising speed, on a flight in support of or in connection with the offshore exploitation of mineral resources (including gas), unless it is equipped with an Automatically Deployable Emergency Locator Transmitter (ELT(AD)).

(c) The operator shall ensure that all ELTs are capable of transmitting simultaneously on 121.5MHz and 406 MHz, are coded in accordance with ICAO Annex 10 and are registered with the national agency responsible for initiating Search and Rescue or another nominatedagency.

ANTR OPS 3.825 Life Jackets
(See IEM OPS 3.825)

(a) The operator shall not operate a helicopter for any operations on water or on a flight over water:

(1) When operating in Performance Class 3 beyond autorotational distance from land; or

(2) When operating in Performance Class 1 or 2 at a distance from land corresponding to more than 10 minutes flying time at normal cruise speed; or

(3) When operating in Performance Class 2 or 3 when taking off or landing at a heliport or landing location where the take-off or approach path is over water, unless it is equipped with life jackets equipped with a survivor locator light, for each person on board, stowed in an easily accessible position, with safety belt or harness fastened, from the seat or berth of the person for whose use it is provided and an individual infant flotation device, equipped with a survivor locator light, for use by each infant on board.

ANTR OPS 3.827 Crew Survival Suits
(See IEM OPS 3.827)

(a) The operator shall not operate a helicopter in Performance Class 1 or 2 on a flight over water at a distance from land corresponding to more than 10 minutes flying time at normal cruising speed from land on a flight in support of or in connection with the offshore exploitation of mineral resources (including gas) when the weather report or forecasts available to the commander indicate that the sea temperature will be less than plus 10°C during the flight or when the estimated rescue time exceeds the estimated survival time unless each member of the crew is wearing a survival suit.

(b) The operator shall not operate a helicopter in Performance Class 3 on a flight over water beyond auto-rotational or safe forced landing distance from land when the weather reportor forecasts available to the commander indicate that the sea temperature will be less thanplus 10°C during the flight, unless each member of the crew is wearing a survival suit.

ANTR OPS 3.830 Life-rafts and survival ELTs on extended overwater flights

(a) The operator shall not operate a helicopter on a flight over water at a distance from land corresponding to more than 10 minutes flying time at normal cruising speed when operating in Performance Class 1 or 2, or 3 minutes flying time at normal cruising speed when operating in Performance Class 3 unless it carries:

(1) In the case of a helicopter carrying less than 12 persons, a minimum of one life-raftwith a rated capacity of not less than the maximum number of persons on board;

(2) In the case of a helicopter carrying more than 11 persons, a minimum of two life-rafts sufficient together to accommodate all persons capable of being carried on board. Each life raft shall be able to carry all occupants in the overload state (See AMC OPS 3.830(a)(2));

(3) Rafts which are not deployable by remote control and which have a mass of more than 40 kg should be equipped with some means of mechanically assisted deployment.

Note: The life raft overload state has a design safety margin of 1.5 times the maximum capacity.

(4) At least one survival Emergency Locator Transmitter (ELT(S)) for each liferaft carried (but not more than a total of 2 ELTs are required), capable of transmitting on the distress frequencies prescribed in Appendix 1 to ANTR-OPS 3.830. (See alsoAMC OPS 3.830(a)(3));

(5) Emergency exit illumination; and

(6) Life saving equipment including means of sustaining life as appropriate to the flight to be undertaken.

ANTR OPS 3.835 Survival equipment
(See IEM OPS 3.835)

The operator shall not operate a helicopter in areas where search and rescue would be especially difficult unless it is equipped with the following:

(a) Signalling equipment to make the pyrotechnical distress signals described in ICAO Annex 2;

(b) At least one survival Emergency Locator Transmitter (ELT(S)) capable of transmitting on the distress frequencies prescribed in Appendix 1 to ANTR-OPS 3.830 (see also AMC OPS 3.830(a)(3)); and

(c) Additional survival equipment and the life-saving equipment (including means of sustaining life) for the route to be flown taking account of the number of persons on board (see AMC OPS 3.835(c)).

ANTR OPS 3.837 Additional requirements for helicopters operating to or from helidecks located in a hostile sea area (as defined in ANTR OPS 3.480(a)(11)(ii)(A))

(a) The operator shall not operate a helicopter on a flight to or from a helideck located in a hostile sea area at a distance from land corresponding to more than 10 minutes flying time at normal cruising speed on a flight in support of or in connection with the offshore exploitation of mineral resources (including gas) unless:

(1) When the weather report or forecasts available to the commander indicate that the sea temperature will be less than plus 10°C during the flight, or when the estimated rescue time exceeds the calculated survival time, or the flight is planned to be conducted at night, all persons on board are wearing a survival suit (see IEM OPS 3.827);

When the elevation and strength of the sun results in a high temperature hazard on the flight deck, consideration should be given to alleviating the flight crew from this recommendation.

Note: When establishing rescue time, the sea state and the ambient light conditions should be taken into consideration.

(2) All liferafts carried in accordance with ANTR OPS 3.830 are installed so as to be usable in the sea conditions in which the helicopter's ditching, flotation and trim characteristics were evaluated in order to comply with the ditching requirements for certification (See IEM OPS 3.837(a)(2));

(3) The helicopter is equipped with an emergency lighting system having an independent power supply to provide a source of general cabin illumination to facilitate the evacuation of the helicopter;

(4) All emergency exits, including crew emergency exits, and its means of opening are conspicuously marked for the guidance of occupants using the exits in daylight or in the dark. Such markings are designed to remain visible if the helicopter is capsizedand the cabin is submerged;

(5) All non-jettisonable doors which are designated as Ditching Emergency Exits have a means of securing them in the open position so they do not interfere with occupants egress in all sea conditions up to the maximum required to be evaluated for ditchingand flotation;

(6) All doors, windows or other openings in the passenger compartment authorised by the BCAA as suitable for the purpose of underwater escape, are equipped so as to be operable in an emergency;

(7) Lifejackets are worn at all times; unless the passenger or crew member is wearing an integrated survival suit that meets the combined requirement of the survival suit and lifejacket which is acceptable to the BCAA.

ANTR OPS 3.840 Helicopters certificated for operating on water - Miscellaneous equipment

(a) The operator shall not operate on water a helicopter certificated for operating on water unless it is equipped with:

(1) A sea anchor and other equipment necessary to facilitate mooring, anchoring or manoeuvring the aircraft on water, appropriate to its size, weight and handling characteristics; and

(2) Equipment for making the sound signals prescribed in the International Regulations for preventing collisions at sea, where applicable.

ANTR OPS 3.843 All helicopters on flights over water - Ditching

(a) The operator shall not operate a helicopter in Performance Class 1 or 2 on a flight over water in a hostile environment at a distance from land corresponding to more than 10minutes flying time at normal cruise speed unless that helicopter is so designed for landingon water or is certificated in accordance with ditching provisions.

(b) The operator shall not operate a helicopter in Performance Class 1 or 2 on a flight over water in a non-hostile environment at a distance from land corresponding to more than 10 minutes flying time at normal cruise speed unless that helicopter is; so designed for landingon water; or is certificated in accordance with ditching provisions; or is fitted with emergency flotation equipment.

(c) The operator shall not operate a helicopter in Performance Class 2, when taking-off or landing over water, unless that helicopter is; so designed for landing on water; or is certificated in accordance with ditching provisions; or is fitted with emergency floatation equipment. (See IEM OPS 3.843(c)). Except where, for the purpose of minimising exposure, the landing or take-off at a HEMS operating site located in a congested environment is conducted over water – unless otherwise required by the BCAA.

(d) The operator shall not operate a helicopter in Performance Class 3 on a flight over water beyond safe forced landing distance from land unless that helicopter is; so designed for landing on water; or is certificated in accordance with ditching provisions; or is fitted with emergency flotation equipment.

Appendix 1 to ANTR OPS 3.700

Flight Recorder - General

(a) Inspections of flight recorder systems

(1) Prior to the first flight of the day, the built-in test features for the flight recorders and Flight Data Acquisition Unit (FDAU), when installed, shall be monitored by manual and/or automatic checks.

(2) FDR systems or ADRS, CVR systems or CARS, and AIR systems or AIRS shall have recording inspection intervals of one year; subject to the approval from the appropriate regulatory authority, this period may be extended to two years provided these systems have demonstrated a high integrity of serviceability and self-monitoring. DLR systems or DLRS shall have recording inspection intervals of two years; subject to the approval from the appropriate regulatory authority, this period may be extended to four years provided these systems have demonstrated high integrity of serviceability and self-monitoring.

(b) Annual inspections shall be carried out as follows:

(1) an analysis of the recorded data from the flight recorders shall ensure that the recorder operates correctly for the nominal duration of the recording;

(2) the analysis of the FDR shall evaluate the quality of the recorded data to determine if the bit error rate (including those introduced by recorder, the acquisition unit, the source of the data on the helicopter and by the tools used to extract the data from the recorder) is within acceptable limits and to determine the nature and distribution of the errors;

(3) a complete flight from the FDR shall be examined in engineering units to evaluate the validity of all recorded parameters. Particular attention shall be given to parameters from sensors dedicated to the FDR. Parameters taken from the aircraft's electrical bus system need not be checked if their serviceability can be detected by other aircraft systems;

(4) the readout facility shall have the necessary software to accurately convert the recorded values to engineering units and to determine the status of discrete signals;

(5) an examination of the recorded signal on the CVR shall be carried out by replay of the CVR recording. While installed in the aircraft, the CVR shall record test signals from each aircraft source and from relevant external sources to ensure that all required signals meet intelligibility standards;

(6) where practicable, during the examination, a sample of in-flight recordings of the CVR shall be examined for evidence that the intelligibility of the signal is acceptable; and

(7) an examination of the recorded images on the AIR shall be carried out by replay of the AIR recording. While installed in the aircraft, the AIR shall record test images from each aircraft source and from relevant external sources to ensure that all required images meet recording quality standards.

(c) Flight recorder systems shall be considered unserviceable if there is a significant period of poor quality data, unintelligible signals, or if one or more of the mandatory parameters is not recorded correctly.

(d) A report of the annual inspection shall be made available on request to regulatory authorities for monitoring purposes.

(e) Calibration requirements of the FDR system shall be as follows:

(1) For those parameters which have sensors dedicated only to the FDR and are not checked by other means, recalibration shall be carried out at an interval determined by the continuing airworthiness information for the FDR system. In the absence of such information, a recalibration shall be carried out at least every five years. The recalibration shall determine any discrepancies in the engineering conversion routines for the mandatory parameters, and to ensure that parameters are being recorded within the calibration tolerances;

(2) When the parameters of altitude and airspeed are provided by sensors that are dedicated to the FDR system, there shall be a recalibration performed at an interval determined by the continuing airworthiness information for the FDR system. In the absence of such information, a recalibration shall be carried out at least every two years.

Appendix 1 to ANTR OPS 3.705

Flight Data Recorder and Aircraft Data Recording System – Parameters to be recorded

(a) The FDR or ADRS shall start to record prior to the helicopter moving under its own power and record continuously until the termination of the flight when the helicopter is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the AIR or AIRS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

Note: *In previous editions of Annex 6, Part III, types of recorders were defined to capture the first evolutions of FDRs.*

(b) The parameters that satisfy the requirements for FDRs, are listed in the Tables to this Appendix. The number of parameters to be recorded shall depend on helicopter complexity. The parameters without an asterisk (*) are mandatory parameters which shall be recorded regardless of helicopter complexity. In addition, the parameters designated by an asterisk (*) shall be recorded if an information data source for the parameter is used by helicopter systems or the flight crew to operate the helicopter. However, other parameters may be substituted with due regard to the helicopter type and the characteristics of the recording equipment.

(1) The following parameters shall satisfy the requirements for flight path and speed:

- Pressure altitude
- Indicated airspeed
- Outside air temperature
- Heading
- Normal acceleration
- Lateral acceleration
- Longitudinal acceleration (body axis)
- Time or relative time count
- Navigation data*: drift angle, wind speed, wind direction, latitude/longitude
- Radio altitude*

(2) If further recording capacity is available, recording of the following additional information shall be considered:

(i) additional operational information from electronic displays, such as electronic flight instruments (EFIS), electronic centralized aircraft monitor (ECAM) and engine indication and crew alerting system (EICAS); and

(ii) additional engine parameters (EPR, N1, Fuel flow, etc.)

(3) The parameters that satisfy the requirements for ADRS are listed in Table 1 of Appendix 2 to ANTR OPS 3.705.

(c) Additional information

(1) The measurement range, recording interval and accuracy of parameters on installed equipment shall be verified by methods approved by the appropriate certificating authority.

(2) Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/maintenance information shall be maintained by the operator. The documentation needs to be sufficient to ensure that accident investigation authorities have the necessary information to read out the data in engineering units.

Table 1
Parameters to be recorded by Crash Protected Flight Data Recorders

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
1	Time (UTC when available, otherwise relative time count or GNSS time sync)		24 hours	4	±0.125% /h	1 s
2	Pressure altitude		–300 m (–1 000 ft) to maximum certificated altitude of aircraft +1 500 m (+5 000 ft)	1	±30 m to ±200 m (±100 ft to ±700 ft)	1.5 m (5 ft)
3	Indicated airspeed		As the installed pilot display measuring system	1	±3%	1 kt
4	Heading		360°	1	±2°	0.5°
5	Normal acceleration		–3 g to +6 g	0.125	±0.09 g excluding a datum error of ±0.045 g	0.004 g
6	Pitch attitude		±75° or 100% of useable range whichever is greater	0.5	±2°	0.5°
7	Roll attitude		±180°	0.5	±2°	0.5°
8	Radio transmission keying		On-off (one discrete)	1	—	—
9	Power on each engine		Full range	1 (per engine)	±2%	0.1% of full range
10	Main rotor:					
	Main rotor speed		50–130%	0.51	±2%	0.3% of full range
	Rotor brake		Discrete		—	—
11	Pilot input and/or control surface position — primary controls (collective pitch, longitudinal cyclic pitch, lateral cyclic pitch, tail rotor pedal)		Full range	0.5 (0.25 recommended)	±2% unless higher accuracy uniquely required	0.5% of operating range
12	Hydraulics, each system (low pressure and selection)		Discrete	1	—	—
13	Outside air temperature		Sensor range	2	±2°C	0.3°C

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
14*	Autopilot/ autothrottle/AFCS mode and engagement status		A suitable combination of discretes	1	—	—
15*	Stability augmentation system engagement		Discrete	1	—	—
16*	Main gearbox oil pressure		As installed	1	As installed	6.895 kN/m^2 (1 psi)
17*	Main gearbox oil temperature		As installed	2	As installed	1°C
18	Yaw rate		±400°/second	0.25	±1.5% maximum range excluding datum error of ±5%	±2°/s
19*	Sling load force		0 to 200% of certified load	0.5	±3% of maximum range	0.5% for maximum certified load
20	Longitudinal acceleration		±1 g	0.25	±0.015 g excluding a datum error of ±0.05 g	0.004 g
21	Lateral acceleration		±1 g	0.25	±0.015 g excluding a datum error of ±0.05 g	0.004 g
22*	Radio altitude		–6 m to 750 m (–20 ft to 2 500 ft)	1	±0.6 m (±2 ft) or ±3% whichever is greater below 150 m (500 ft) and ±5% above 150 m (500 ft)	0.3 m (1 ft) below 150 m (500 ft), 0.3 m (1 ft) + 0.5% of full range above 150 m (500 ft)
23*	Vertical beam deviation		Signal range	1	±3%	0.3% of full range
24*	Horizontal beam deviation		Signal range	1	±3%	0.3% of full range
25	Marker beacon passage		Discrete	1	—	—
26	Warnings		Discrete(s)	1	—	—
27	Each navigation receiver frequency selection		Sufficient to determine selected frequency	4	As installed	—
28*	DME 1 and 2 distances		0–370 km (0–200 NM)	4	As installed	1 852 m (1 NM)

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
29*	Navigation data (latitude/longitude, ground speed, drift angle, wind speed, wind direction)		As installed	2	As installed	As installed
30*	Landing gear and gear selector position		Discrete	4	—	—
31*	Engine exhaust gas temperature (T_4)		As installed	1	As installed	
32*	Turbine inlet temperature (TIT/ITT)		As installed	1	As installed	
33*	Fuel contents		As installed	4	As installed	
34*	Altitude rate		As installed	1	As installed	
35*	Ice detection		As installed	4	As installed	
36*	Helicopter health and usage monitor system		As installed	—	As installed	—
37	Engine control modes		Discrete	1	—	—
38*	Selected barometric setting (pilot and co-pilot)		As installed	64 (4 recommended)	As installed	0.1 mb (0.01 in Hg)
39*	Selected altitude (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
40*	Selected speed (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
41*	Selected Mach (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
42*	Selected vertical speed (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
43*	Selected heading (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
44*	Selected flight path (all pilot selectable modes of operation)		As installed	1	As installed	Sufficient to determine crew selection
45*	Selected decision height		As installed	4	As installed	Sufficient to determine crew selection
46*	EFIS display format (pilot and co-pilot)		Discrete(s)	4	—	—
47*	Multi-function/ engine/alerts display format		Discrete(s)	4	—	—
48*	Event marker		Discrete	1	—	—
49*	GPWS/TAWS/GCAS status (selection of terrain display mode including pop-up display status) and (terrain alerts, both cautions and warnings, and advisories) and (on/off switch position) and (operational status)	Application for type certification is submitted to a Contracting State on or after 1 January 2023	Discrete(s)	1	As installed	
50*	TCAS/ACAS (traffic alert and collision avoidance system) and (operational status)	Application for type certification is submitted to a Contracting State on or after 1 January 2023	Discrete(s)	1	As installed	
51*	Primary flight controls – pilot input forces	Application for type certification is submitted to a Contracting State on or after 1 January 2023	Full range	0.125 (0.0625 recommended)	± 3% unless higher accuracy is uniquely required	0.5% of operating range

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
52*	Computed centre of gravity	Application for type certification is submitted to a Contracting State on or after 1 January 2023	As installed	64	As installed	1% of full range
53*	Helicopter computed weight	Application for type certification is submitted to a Contracting State on or after 1 January 2023	As installed	64	As installed	1% of full range

Appendix 2 to ANTR OPS 3.705

Flight Data Recorders and Aircraft Data Recording Systems

Airborne Image Recorder (AIR) and Airborne Image Recording System (AIRS) Classification:

(a) The AIR or AIRS shall start to record prior to the helicopter moving under its own power and record continuously until the termination of the flight when the helicopter is no longer capable of moving under its own power. In addition, depending on the availability of electrical power, the AIR or AIRS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

Classes

(1) A Class A AIR or AIRS captures the general cockpit area in order to provide data supplemental to conventional flight recorders.

Note 1: To respect crew privacy, the cockpit area view may be designed as far as practical to exclude the head and shoulders of crew members whilst seated in their normal operating position.

Note 2: There are no provisions for Class A AIRs or AIRS in this document.

(2) A Class B AIR or AIRS captures data link message displays.

(3) A Class C AIR or AIRS captures instruments and control panels.

Note: A Class C AIR or AIRS may be considered as a means for recording flight data where it is not practical or is prohibitively expensive to record on an FDR, or where an FDR is not required.

Table 1
Parameter Guidance for Aircraft Data Recording System (ADRS)

N°	Parameter name	Minimum recording range	Maximum recording interval in seconds	Minimum recording accuracy	Minimum recording resolution	Remarks
1	Heading:					
	a) Heading (Magnetic or True)	±180°	1	±2°	0.5°	*Heading is preferred, if not available, yaw rate shall be recorded
	b) Yaw rate	±300°/s	0.25	±1% + drift of 360°/h	2°/s	
2	Pitch:					
	a) Pitch attitude	±90°	0.25	±2°	0.5°	*Pitch attitude is preferred, if not available, pitch rate shall be recorded
	b) Pitch rate	±300°/s	0.25	±1% + drift of 360°/h	2°/s	
3	Roll:					
	a) Roll attitude	±180°	0.25	±2°	0.5°	*-Roll attitude is preferred, if not available, roll rate shall be recorded
	b) Roll rate	±300°/s	0.25	±1% + drift of 360°/h	2°/s	
4	Positioning system:					
	a) Time	24 hours	1	±0.5°	0.1°	UTC time preferred where available
	b) Latitude/longitude	Latitude:±90° Longitude:±180°	2 (1 if available)	As installed (0.00015° recommended)	0.00005°	
	c) Altitude	–300 m (–1 000 ft) to maximum certificated altitude of aircraft +1 500 m (5 000 ft)	2 (1 if available)	As installed (±15 m (±50 ft) recommended)	1.5 m (5 ft)	
	d) Ground speed	0–1 000 kt	2 (1 if available)	As installed (±5 kt recommended)	1 kt	
	e) Track	0–360°	2 (1 if available)	As installed (± 2° recommended)	0.5°	
	f) Estimated error	Available range	2 (1 if available)	As installed	As installed	Shall be recorded if readily available

N°	Parameter name	Minimum recording range	Maximum recording interval in seconds	Minimum recording accuracy	Minimum recording resolution	Remarks
5	Normal acceleration	–3 g to + 6 g	0.25 (0.125 if available)	As installed (±0.09 g excluding a datum error of ±0.05 g recommended)	0.004 g	
6	Longitudinal acceleration	±1 g	0.25 (0.125 if available)	As installed (±0.015 g excluding a datum error of ±0.05 g recommended)	0.004 g	
7	Lateral acceleration	±1 g	0.25 (0.125 if available)	As installed (±0.015 g excluding a datum error of ±0.05 g recommended)	0.004 g	
8	External static pressure (or pressure altitude)	34.4 hPa (1.02 in-Hg) to 310.2 hPa (9.16 in-Hg) or available sensor range	1	As installed (±1 hPa (0.3 in-Hg) or ±30 m (±100 ft) to ±210 m (±700 ft) recommended)	0.1 hPa (0.03 in-Hg) or 1.5 m (5 ft)	
9	Outside air temperature (or total air temperature)	–50° to +90°C or available sensor range	2	As installed (±2°C recommended)	1°C	
10	Indicated air speed	As the installed pilot display measuring system or available sensor range	1	As installed (±3% recommended)	1 kt (0.5 kt recommended)	
11	Main rotor speed (Nr)	50% to 130% or available sensor range	0.5	As installed	0.3% of full range	
12	Engine RPM (*)	Full range including overspeed condition	Each engine each second	As installed	0.2% of full range	*For piston-engined helicopters
13	Engine oil pressure	Full range	Each engine each second	As installed (5% of full range recommended)	2% of full range	
14	Engine oil temperature	Full range	Each engine each second	As installed (5% of full range recommended)	2% of full range	
15	Fuel flow or pressure	Full range	Each engine each second	As installed	2% of full range	
16	Manifold pressure (*)	Full range	Each engine each second	As installed	0.2% of full range	*For piston-engined helicopters

N°	Parameter name	Minimum recording range	Maximum recording interval in seconds	Minimum recording accuracy	Minimum recording resolution	Remarks
17	Engine thrust/power/ torque parameters required to determine propulsive thrust/power*	Full range	Each engine each second	As installed	0.1% of full range	*Sufficient parameters e.g. EPR/N1 or torque/Np as appropriate to the particular engine shall be recorded to determine power. A margin for possible overspeed should be provided. Only for turbine-engined helicopters.
18	Engine gas generator speed (Ng) (*)	0–150%	Each engine each second	As installed	0.2% of full range	*Only for turbine-engined helicopters
19	Free power turbine speed (Nf) (*)	0–150%	Each engine each second	As installed	0.2% of full range	*Only for turbine-engined helicopters
20	Collective pitch	Full range	0.5	As installed	0.1% of full range	
21	Coolant temperature (*)	Full range	1	As installed (±5°C recommended)	1° C	*Only for piston-engined helicopters
22	Main voltage	Full range	Each engine each second	As installed	1 Volt	
23	Cylinder head temperature (*)	Full range	Each cylinder each second	As installed	2% of full range	*Only for piston-engined helicopters
24	Fuel quantity	Full range	4	As installed	1% of full range	
25	Exhaust gas temperature	Full range	Each engine each second	As installed	2% of full range	
26	Emergency voltage	Full range	Each engine each second	As installed	1 Volt	
27	Trim surface position	Full range or each discrete position	1	As installed	0.3% of full range	
28	Landing gear position	Each discrete position*	Each gear every two seconds	As installed		*Where available, record up-and-locked and down-and-locked position
29	Novel/unique aircraft features	As required	As required	As required	As required	

Appendix 1 to ANTR OPS 3.710

Cockpit Voice Recorders and Cockpit Audio Recording Systems - List of signals to be recorded.

(a) The CVR shall record on four separate channels, or more, at least the following:

(1) voice communication transmitted from or received in the Aircraft by radio;

(2) aural environment on the flight deck;

(3) voice communication of flight crew members on the flight deck using the interphone system, if installed;

(4) voice or audio signals identifying navigation or approach aids introduced in the headset or speaker; and

(5) voice communication of flight crew members using the passenger address system, if installed.

(b) The preferred CVR audio allocation should be as follows:

(1) pilot-in-command audio panel;

(2) co-pilot audio panel;

(3) additional flight crew positions and time reference; and

(4) cockpit area microphone.

(c) The CARS shall record on two separate channels, or more, at least the following:

(1) voice communication transmitted from or received in the helicopter by radio;

(2) aural environment on the flight deck; and

(3) voice communication of flight crew members on the flight deck using the helicopter's interphone system, if installed.

(d) The preferred CARS audio allocation should be as follows:

(1) voice communication; and

(2) aural environment on the flight deck.

Appendix 1 to ANTR OPS 3.715

Data Link Recorders

(a) Applications to be recorded

(1) Where the helicopter flight path is authorized or controlled through the use of data link messages, all data link messages, both uplinks (to the helicopter) and downlinks (from the helicopter), shall be recorded on the helicopter. As far as practicable, the time the messages were displayed to the flight crew and the time of the responses shall be recorded.

Note: Sufficient information to derive the content of the data link communications message and the time the messages were displayed to the flight crew is needed to determine an accurate sequence of events on board the aircraft.

(2) Messages applying to the applications listed in table below shall be recorded. Applications without the asterisk (*) are mandatory applications which shall be recorded regardless of the system complexity. Applications with an (*) are to be recorded only as far as is practicable given the architecture of the system.

(b) Description of Applications for Data Link Recorder

Item No.	Application type	Application description	Recoding content
1	Data link Initiation	This includes any applications used to logon to or initiate data link service. In FANS-1/A and ATN, these are ATS Facilities Notification (AFN) and Context Management (CM) respectively.	C
2	Controller/Pilot Communication	This includes any application used to exchange requests, clearances, instructions and reports between the flight crew and controllers on the ground. In FANS-1/A and ATN, this includes the CPDLC application. It also includes applications usedfor the exchange of oceanic (OCL) and departure clearances (DCL) as well as data link delivery of taxiclearances.	C
3	Addressed Surveillance	This includes any surveillance application in which the ground sets up contracts for delivery of surveillance data. In FANS-1/A and ATN, this includes the Automatic Dependent Surveillance (ADS-C) application. Where parametric data are reported within the message they shall be recorded unless data from the same source are recorded on the FDR.	C
4	Flight Information	This includes any service used for delivery of flight information to specific aircraft. This includes, for example, data link aviation weather report service (D-METAR), data link automatic terminal service (D-ATIS), digital notice to Airmen (D-NOTAM) and other textual data link services.	C
5	Aircraft Broadcast Surveillance	This includes elementary and enhanced surveillance systems, as well as automatic dependent surveillance broadcast (ADS-B) output data.Where parametric data sent by the helicopter are reported within the message they shall be recorded unless data from the same source are recorded on the FDR.	M*
6	Aeronautical Operational Control Data	This includes any application transmitting or receiving data used for Aeronautical Operational Control purposes (per the ICAO definition of Operational Control).	M*

Key:

C**:** Complete contents recorded.
M**:** Information that enables correlation to any associated records stored separately from the helicopter.
***:** Applications that are to be recorded only as far as is practicable given the architecture of the system.

Appendix 1 to ANTR OPS 3.775

Supplemental Oxygen for non-pressurised Helicopters

Table 1

(a)		(b)
SUPPLY FOR:		**DURATION AND PRESSURE ALTITUDE**
1.	All occupants of flight deck seats on flight deck duty	Entire flight time at pressure altitudes above 10 000 ft.
2.	All required cabin crew members	Entire flight time at pressure altitudes above 13 000 ft and for any period exceeding 30 minutes at pressure altitudes above 10 000 ft but not exceeding 13 000 ft.
3.	100% of passengers (See Note)	Entire flight time at pressure altitudes above 13 000 ft.
4.	10% of passengers (See Note)	Entire flight time after 30 minutes at pressure altitudes greater than 10 000 ft but not exceeding 13 000 ft.

Note: *For the purpose of this table 'passengers' means passengers actually carried and includes infants under the age of 2.*

Appendix 1 to ANTR OPS 3.785

Automatic Landing Systems, Head-Up Display (HUD), Equivalent Displays and Vision Systems (VS)
(See ANTR OPS 3.785)

Introduction

The material in this appendix provides guidance for certified automatic landing systems, HUD, equivalent displays and vision systems intended for operational use in helicopters engaged in international air navigation. These systems and hybrid systems may be installed and operated to reduce workload, improve guidance, reduce flight technical error and enhance situational awareness and/or to obtain an operational credit by establishing minima below the aerodrome operating minima, for approach ban purposes, or reducing the visibility requirements or requiring fewer ground facilities as compensated for by airborne capabilities. Automatic landing systems, HUD, equivalent displays and vision systems may be installed separately or together as part of a hybrid system.

The installation and operational use of these systems as well as any operational credit that can be derived from their use require BCAA approval.

Subject to, but not limited to, the operator's experience of the airport and limits of the design approval of the equipment, the BCAA may, at its discretion, consider the grant of operational credit for the use of HUD/EVS when operating in instrument conditions.

When obtaining operational credit, the operator is required to apply for an exemption from the Air Navigation Technical Regulations (ANTRs). An exemption can only be granted by the BCAA for a system that utilises a HUD as part of the EVS equipment.

Note 1: "Vision systems" is a generic term referring to the existing systems designed to provide images, i.e. enhanced vision systems (EVS), synthetic vision systems (SVS) and combined vision systems (CVS).

Note 2: Operational credit can be granted only within the limits of the airworthiness approval.

Note 3: Currently, operational credit has been given only to vision systems containing an image sensor providing a real-time image of the actual external scene on a HUD.

Note 4: More detailed information and guidance on automatic landing systems, HUD, equivalent displays and vision systems is contained in CAP 33 - Head-Up Displays (HUD) and Enhanced Vision Systems (EVS). This CAP should be consulted in conjunction with this appendix.

(a) HUD and Equivalent Displays

(1) General

A HUD presents flight information into the pilot's forward external field of view without significantly restricting that external view.

Flight information shall be presented on a HUD or an equivalent display as required for the intended use (see CAP 33 for further details).

(2) Operational applications

Flight operations with a HUD can improve situational awareness by combining flight information located on head-down displays with the external view to provide pilots with more immediate awareness of relevant flight parameters and situation information while they continuously view the external scene. This improved situational awareness can also reduce errors in flight operations and improve the pilot's ability to transition between instrument and visual references as meteorological conditions change.

A HUD may be used:

(i) As a secondary flight display to supplement conventional flight deck instrumentation.

(ii) or as a primary flight display if certified for this purpose.

An approved HUD, may qualify for operations with reduced visibility or reduced RVR or replace some parts of the ground facilities such as touchdown zone and/or centre line lights.

The functions of a HUD may be provided by a suitable equivalent display. However, before such systems can be used, the appropriate airworthiness and operational approval should be obtained.

Note: CAP 33 contains further details regarding operational applications.

(3) HUD training

The operator shall comply with the training and recent experience requirements for operations using HUD or equivalent displays as established by the BCAA. Training programmes shall be approved by the BCAA and the implementation of the training shall be subject to oversight by the BCAA.

The training shall address all flight operations for which the HUD or equivalent display is used (see CAP 33 for further details).

(b) Enhanced Vision Systems (EVS)

(1) General

“Vision systems” is used as a generic term to refer to the existing systems designed to provide images, i.e. enhanced vision systems (EVSs), synthetic vision systems (SVSs) and combined vision systems (CVSs).

Vision systems can display electronic real-time images of the actual external scene achieved through the use of image sensors (i.e. EVS) or display synthetic images, which are derived from the on-board avionic systems (i.e. SVS). Vision systems can also consist of a combination of these two systems, called combined vision systems (i.e. CVS). Such a system may display electronic real-time images of the external scene using the EVS component of the system. The information from vision systems may be displayed head-up and/or head-down. Operational credit may be granted to vision systems which are appropriately qualified.

Light emitting diode (LED) lights may not be visible to infrared -based vision systems. Operators of such vision systems will need to acquire information about the LED implementation programmes at aerodromes where they intend to operate. More details about the consequences of LED lights are contained in CAP33.

(2) Operational applications

Flight operations with EVS allow the pilot to view an image of the external scene obscured by darkness or other visibility restrictions. The use of EVS will also allow acquisition of an image of the external scene earlier than with natural unaided vision, hence providing for a smoother transition to references by natural vision. The improved acquisition of an image of the external scene may improve situational awareness.

Vision system imagery may also enable pilots to detect other aircraft on the ground, terrain or obstructions on or adjacent to runways or taxiways.

It may also qualify for operational credit for reduced visibility minima when the images are presented into the pilot's external field of view on a HUD without significantly restricting that view.

(3) Vision systems training

Training and recent experience requirements shall be established by the BCAA. Training programmes shall be approved by the BCAA and the implementation of the training shall be subject to oversight by the BCAA. Training shall address all flight operations for which the vision system is used.

This training should include contingency procedures required in the event of system degradation or failure. Training for situational awareness should not interfere with other required operations. Training for operational credit should also require training on the applicable HUD used to present the enhanced visual imagery (see CAP 33 for further details).

(4) Operational concepts

Instrument approach operations that involve the use of vision systems include an instrument phase and a visual phase. The instrument phase ends at the published MDA/H or DA/H unless a missed approach is initiated. Using the EVS or CVS does not change the applicable MDA/H or DA/H. The continued approach to landing from MDA/H or DA/H will be conducted using visual references.

This also applies to operations with vision systems. The difference is that the visual references will be acquired by use of an EVS or CVS, natural vision or the vision system in combination with natural vision (see Figure 1-1 below).

Down to a defined height in the visual segment, typically at or above 30 m (100 ft), the visual references may be acquired solely by means of the vision system. The defined height depends on the airworthiness approval and specific approval by the State of the Operator. Below this height the visual references should be solely based on natural vision. In the most advanced applications, the vision system may be used down to touchdown without the requirement for natural vision acquisition of visual references. This means that such a vision system may be the sole means of acquiring visual references and can be used without natural vision (see CAP 33 for further details).

EVS operations

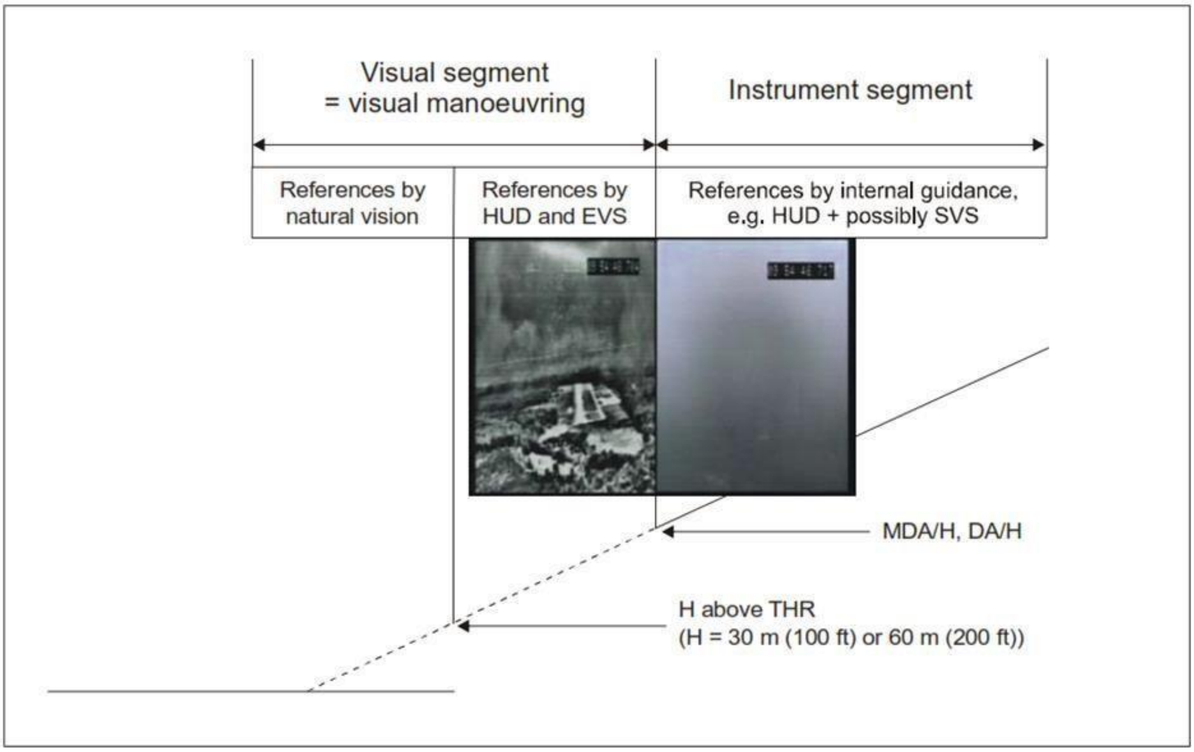


Figure 1-1. EVS operations - transition from instrument to visual references

(5) Visual references

In principle, the required visual references do not change due to the use of an EVS or CVS, but those references are allowed to be acquired by means of either vision system until a certain height during the approach.

States that have developed requirements for operations with vision systems, the use of visual references as indicated in Table 1-1 has been regulated and examples of this are provided in CAP 33.

(c) Hybrid systems

A hybrid system generically means that two or more systems are combined. The hybrid system typically has improved performance compared to each of the component systems, which in turn may qualify for operational credit. The inclusion of more systems in the hybrid system normally enhances the performance of the system (See CAP 33 for examples of hybrid systems).

(d) Operational credits

Aerodrome operating minima are expressed in terms of minimum visibility/RVR and MDA/H or DA/H. When aerodrome operating minima are established, the combined capability of the helicopters equipment and on-ground infrastructure should be taken into account. Better equipped helicopters may be able to operate into lower natural visibility conditions, lower DA/H and/or operate with less ground infrastructure. Operational credit means that the aerodrome operating minima may be reduced in case of suitably equipped helicopters. Another way to grant operational credit is to allow visibility requirements to be fulfilled, wholly or partly, by means of the on-board systems. HUD, automatic landing or vision systems were not available at the time when the criteria for aerodrome operating minima were originally established.

The granting of operational credits does not affect the classification (i.e. Type or Category) of an instrument approach procedure since they are designed to support instrument approach operations conducted using helicopters with the minimum equipment prescribed.

The relation between the procedure design and the operation can be described as follows. The OCA/H is the end product of the procedure design which does not contain any RVR or visibility values. Based on the OCA/H and all the other elements such as available runway visual aids, the operator will establish MDA/H or DA/H and RVR/visibility, i.e. the aerodrome operating minima. The values derived should not be less than those prescribed by the State of the Aerodrome.

(e) Operational Procedures

The operator should develop suitable operational procedures associated with the use of an automatic landing system, a HUD or an equivalent display, vision systems and hybrid systems. These procedures should be included in the operations manual and cover at least the following:

(1) limitations;

(2) operational credits;

(3) flight planning;

(4) ground and airborne operations;

(5) crew resource management;

(6) standard operating procedures; and

(7) ATS flight plans and radio communication.

(f) Approval Requirements

General

Approval requirements differ based on whether the intended function of the system is to increase situational awareness or to obtain operational credit.

When enhanced vision imagery is used to improve situational awareness, operational approval requirements may be limited. An example of this type of operation may include an EVS or an SVS on a head-down display that is used only for situational awareness of the surrounding area of the helicopter during ground operations where the display is not in the pilot‘s primary field of view. For enhanced situational awareness, the installation and operational procedures need to ensure that the operation of the vision system does not interfere with normal procedures or the operation or use of other helicopter systems. In some cases, modifications to these normal procedures for other helicopter systems or equipment may be necessary to ensure compatibility.

When EVS is used for operational credit, operational approval standards shall ensure the credit for the individual image sensor or combination of sensors is appropriate. Operational credit may be applied for any flight operation, but credit for instrument approach and landing operations is more common.

Any operational approval (including specific approval for operational credit) that has been granted shall be reflected in the operation specifications for the type or individual helicopter as applicable.

Note: When the application for a specific approval relates to operational credits for systems not including a vision system, the guidance on approvals in this attachment may be used to the extent applicable as determined by the BCAA.

(g) Application Process for EVS/HUD Operational Approval

An application for the approval for the use of HUD/EVS shall be made using the application form, ALD/OPS/F112 on the BCAA website, www.mtt.gov.bh.

The content of a suitable application should include:

(1) *Applicant details - required for all approval requests*. The official name and business or trading name(s), address mailing address, e -mail address and contact telephone/fax numbers of the applicant.

Note: For AOC holders, the company name, AOC number and e -mail address should be required.

(2) *Aircraft details - required for all approval requests*. Aircraft make(s), model(s) and registration mark(s).

(3) *Operator's vision system compliance list*. The contents of the compliance list are included in Table 1-3 (Section IV) below and in CAP 33. The compliance list should include the information that is relevant to the approval requested and the registration marks of the aircraft involved. If more than one type of aircraft/fleet is included in a single application a completed compliance list should be included for each aircraft/fleet.

The following items shall be covered in a vision systems compliance list:

(i) reference documents used in compiling the submission for approval;

(ii) flight manual;

(iii) feedback and reporting of significant problems;

(iv) requested operational credit and resulting aerodrome operating minima;

(v) operations manual (or an equivalent document) entries including MEL (where applicable) and standard operating procedures;

(vi) safety risk assessments;

(vii) training programmes; and

(viii) continuing airworthiness

Note 1: Expanded guidance on these items is contained in CAP 33.

Note 2: Application form ALD/OPS/F112 and the Vision Systems Compliance List is contained in CAP 33.

(4) *Documents to be included with the application*. Copies of all documents referred to in column 4 of the operator's vision system compliance list (Table 1 -3 Section IV) should be included when returning the completed application form to the civil aviation BCAA. There should no need to send complete manuals; only the relevant sections/pages should be required.

(5) *Name, title and signature*.

Table 1-3 Application for EVS/HUDLS Operational Approval (ALD/OPS/F112).

APPLICATION FOR HUD/EVS OPERATIONAL APPROVAL

1. Applicant Details		
Operator Name		AOC No:
Address, mailing address		
E-mail address and contact telephone/fax		
2. Aircraft Details - required for all Approval requests Aircraft type(s), series and registration mark(s).		
Aircraft Type		
Aircraft Series		
Registration		
Formal approval will normally be subject to a flight and simulator observation		
3. Documents to be included with the application (refer to section IV)		
SECTION II—Applications for EVS/HUD (please tick as appropriate**)** (1) To be used for situational awareness ☐ and (2) To obtain operational credit ☐ (see Vision Systems Compliance List, Section IV, item 4)		
SECTION III SIGNATURE BLOCK		
Name (BLOCK LETTERS)		
Appointment		
Signature		

SECTION IV VISION SYSTEMS COMPLIANCE LIST			
Main heading	**Expanded areas to be addressed by application**	**Sub-requirements**	**Operator's operations manual reference or document reference**
1. Reference documents used in compiling the submission	The submission shall be based on current up-to-date regulatory material. A compliance statement showing how the criteria of the applicable regulations and requirements have been satisfied.		
2. Aircraft flight manual (AFM)	A copy of the relevant AFM entry showing the aircraft certification basis for the vision system and any operational conditions.		
3. Feedback and reporting of significant problems	An outline of the process for the reporting of failures in the operational use of procedures. *Note: In particular, significant problems with the vision system / HUD system, reporting on circumstances / locations where the vision system was unsatisfactory.*		
4. Requested operational credit and resulting operating minima	The requested operational credit in accordance with the applicable national regulations. Confirmation that all aerodrome operating minima are established in accordance with the method acceptable to the relevant authority.		
5. Operations manual entries and standard operating procedures	Manufacturer/operator-developed. Manufacturer's procedures are recommended as a starting point and shall include at least the items in the sub-requirements column.	Definitions. Check that crew are qualified for EVS/HUD operations MEL handling Equipment required for EVS operations. Types of approach where EVS can be used. Statement that autopilot/flight director should be used whenever possible.	

		Minimum visual references for landing Approach Ban and RVR. Stabilized Approach Criteria. Correct seating and eye position. Crew co-ordination, e.g. duties of PF and PNF: • designation of handling and non-handling pilots; • use of automatic flight control system; • checklist handling; • approach briefing; • radio communications Operations Manual entries and Standard Operating Procedures (contain handling; • monitoring and cross-checking of instruments and radio aids; and • use of the repeater display by PNF Contingency procedures including: • failures above and below decision height; • ILS deviation warnings; • autopilot disconnect; • auto-throttle disconnect; • electrical failures; • engine failure; • failures and loss of visual references at or below decision height; and • EVS/HUDLS failure below normal decision height • wind shear; • ACAS warnings; • EGPWS warnings	
6. Safety risk assessment			

7. Training Programmes	Training programmes including the training syllabi for the system contained in the application.		
8. Continuing Airworthiness	Continuing airworthiness programme for the system contained in the application.		

Any Further Comments to Support Your Application:

BCAA USE

Recommendations: ☐ Approved ☐ Not Approved

Remarks:-

FOI name Signature Date

Recommendation ☐ Approved ☐ Not Approved

Remarks:-

Recommendation ☐ Approved ☐ Not Approved

Remarks:-

DAL Name	Signature	Date

Appendix 1 to ANTR OPS 3.830

Emergency Locator Transmitter (ELT(S))

(See ANTR OPS 3.380 and ANTR-OPS 3.835)

(a) All ELT(S) shall be capable of transmitting simultaneously on 121.5 MHz and 406 MHz, be coded in accordance with ICAO Annex 10 and be registered with the national agency responsible for initiating Search and Rescue, or another nominated agency.

SUBPART L – COMMUNICATION, NAVIGATION AND SURVEILLANCE EQUIPMENT

ANTR OPS 3.845 General introduction
(See IEM OPS 3.845)

(a) The operator shall ensure that a flight does not commence unless the communication and navigation equipment required under this Subpart is:

(1) Approved and installed in accordance with the requirements applicable to them, including the minimum performance standard and the operational and airworthiness requirements;

(2) Installed such that the failure of any single unit required for communication, navigation or surveillance purposes, or any combination thereof, will not result in the failure of another unit required for communication, navigation or surveillance purposes.

Helicopters shall have sufficient navigation equipment to ensure that, in the event of failure of one item of equipment at any stage of the flight, the remaining equipment will enable the helicopter to navigate in accordance with the flight plan

(3) In operable condition for the kind of operation being conducted except as provided in the MEL (ANTR OPS 3.030 refers); and

(4) So arranged that if equipment is to be used by one flight crew member at his station during flight it must be readily operable from his station. When a single item of equipment is required to be operated by more than one flight crew member it must be installed so that the equipment is readily operable from any station at which the equipment is required to be operated.

(b) Communication and navigation equipment minimum performance standards are those prescribed in the applicable Technical Standard Orders (TSO), unless different performance standards are prescribed in the operational or airworthiness codes. Communication and navigation equipment complying with design and performance specifications on the date of OPS implementation may remain in service, or be installed, unless additional requirements are prescribed in this Subpart. Communication and navigation equipment which has already been approved does not need to comply with a revised TSO or a revised specification unless a retroactive requirement is prescribed.

ANTR OPS 3.850 Communication Equipment

(a) The operator shall not operate a helicopter unless it is equipped with radio required for the kind of operation being conducted.

(b) A helicopter shall be provided with radio communication equipment capable of:

1) conducting two-way communication for heliport control purposes;

2) receiving meteorological information at any time during flight; and

3) conducting two-way communication at any time during flight with at least one aeronautical station and with such other aeronautical stations and on such frequencies as may be prescribed by the appropriate authority.

(c) Where two independent (separate and complete) radio systems are required under this Subpart, each system must have an independent antenna installation except that, where rigidly supported non-wire antennae or other antenna installations of equivalent reliability are used, only one antenna is required.

(d) The radio communication equipment required to comply with paragraph (a) above must also provide for communications on the aeronautical emergency frequency 121·5 MHz.

(e) For operations where communication equipment is required to meet an RCP specification for performance-based communication (PBC), an helicopter shall, in addition to the requirements specified in this Subpart:

(1) be provided with communication equipment which will enable it to operate in accordance with the prescribed RCP specification(s); and

(2) have information relevant to the helicopter RCP specification capabilities listed in the helicopter flight manual or other helicopter documentation approved by the State of Design or the BCAA, as the State of Registry, and

(3) have information relevant to the helicopter RCP specification capabilities included in the MEL.

(f) The BCAA shall, for operations where an RCP specification for PBC has been prescribed, ensure that the operator has established and documented:

(1) normal and abnormal procedures, including contingency procedures;

(2) flight crew qualification and proficiency requirements, in accordance with appropriate RCP specifications;

(3) a training programme for relevant personnel consistent with the intended operations; and

(4) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RCP specifications.

(g) The BCAA shall ensure that, in respect of those helicopters mentioned in sub-paragraph (d) above, adequate provisions exist for:

(1) receiving the reports of observed communication performance issued by monitoring programmes; and

(2) taking immediate corrective action for individual helicopters, helicopter types or operators, identified in such reports as not complying with the RCP specification.

Note: Information on the performance-based communication and surveillance (PBCS) concept and guidance material on its implementation are contained in the Performance-based Communication and Surveillance (PBCS) Manual (ICAO DOC 9869).

ANTR OPS 3.855 Audio Selector Panel

The operator shall not operate a helicopter under IFR unless it is equipped with an audio selector panel accessible to each required flight crew member.

ANTR OPS 3.860 Radio equipment for operations under VFR over routes navigated by reference to visual landmarks

The operator shall not operate a helicopter under VFR over routes that can be navigated by reference to visual landmarks, unless it is equipped with the radio equipment (communication and SSR transponder equipment) necessary under normal operating conditions to fulfil the following:

(a) Communicate with appropriate ground stations;

(b) Communicate with appropriate air traffic control facilities from any point in controlled airspace within which flights are intended;

(c) Receive meteorological information; and

(d) When mandated by airspace requirements, reply to SSR interrogations with a pressure- altitude reporting transponder which operates in accordance with ICAO Annex 10, Volume IV.

Note: This provision is intended to support the effectiveness of ACAS as well as to improve the effectiveness of air traffic services. The intent is also for aircraft not equipped with pressure-altitude reporting transponders to be operated so as not to share airspace used by aircraft equipped with airborne collision avoidance systems.

ANTR OPS 3.865 Communication and Navigation equipment for operations under IFR, or under VFR over routes not navigated by reference to visual landmarks

(a) The operator shall not operate a helicopter under IFR, or under VFR over routes that cannot be navigated by reference to visual landmarks, unless the helicopter is equipped with radio (communication and SSR transponder) and navigation equipment in accordance with the requirements of air traffic services in the area(s) of operation.

(b) *Radio equipment.* The operator shall ensure that radio equipment comprises not less than:

(1) Two independent radio communication systems necessary under normal operating conditions to communicate with an appropriate ground station from any point on the route including diversions; and

(2) When mandated by airspace requirements, a pressure-altitude reporting transponder which operates in accordance with ICAO Annex 10, Volume IV.

(c) *Navigation equipment*. The operator shall ensure that navigation equipment will enable it to proceed in accordance with its flight plan; and in accordance with the requirements of air traffic services; and

(1) Comprises not less than:

(i) Two independent navigation aids appropriate to the route/area to be flown;

(ii) An approach aid suitable for the destination and alternate heliports or landing locations;

(iii) An Area Navigation System when area navigation is required for the route/area being flown;

(iv) Two VOR receiving systems on any route, or part thereof, where navigation is based only on VOR signals; and

(v) Two ADF systems on any route, or part thereof, where navigation is based only on NDB signals, or

(2) For operations where a navigation specification for performance-based navigation (PBN)

has been prescribed, a helicopter shall, in addition to requirements specified in this Subpart;

(i) be provided with navigation equipment which will enable it to operate in accordance with the prescribed navigation specification(s); and

(ii) have information relevant to the helicopter navigation specification capabilities listed in the helicopter flight manual or other helicopter documentation approved by the State of Design or the BCAA as the State of Registry, and

(iii) have information relevant to the helicopter navigation specification capabilities included in the MEL (See also AC OPS 1.243).

(See also IEM OPS 3.243).

(3) On flights in which it is intended to land in instrument meteorological conditions, a helicopter shall be provided with appropriate navigation equipment providing guidance to a point from which a visual landing can be effected. This equipment shall be capable of providing such guidance at each heliport at which it is intended to land in instrument meteorological conditions and at any designated alternate heliports.

(d) Operations where a navigation specification for PBN has been prescribed, the operator shall establish and document:

(1) normal and abnormal procedures, including contingency procedures;

(2) flight crew qualification and proficiency requirements, in accordance with appropriate navigation specifications;

(3) a training programme for relevant personnel consistent with the intended operations; and

(4) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate navigation specifications.

Note: 1. Guidance on safety risks and mitigations for PBN operations, in accordance with Annex 19, are contained in the Performance-based Navigation (PBN) Operational Approval Manual (ICAO DOC 9997).

Note: 2. Electronic navigation data management is an integral part of normal and abnormal procedures.

(e) The BCAA shall issue a specific approval for operations based on PBN authorisation required (AR) navigation specifications.

Note: Guidance on specific approvals for PBN authorization required (AR) navigation specifications is contained in the Performance-based Navigation (PBN) Operational Approval Manual (ICAO DOC 9997).

(f) The operator may operate a helicopter that is not equipped with the navigation equipment specified in sub-paragraph(s) (c)(1)(iv) and/or (c)(1)(v) above, provided that it is equipped with alternative equipment authorised for the route/area being flown by the BCAA. The reliability and the accuracy of alternative equipment must allow safe navigation for the intended route.

(g) When operating in regional airspace requiring FM immunity performance standards, the operator shall ensure that VHF communication equipment, ILS Localiser and VOR receivers installed on helicopters to be operated under IFR are of a type that has been approved as complying with the FM immunity performance standards (see AC OPS 3.865(e)).

(h) Where not more than one item of equipment specified in (a) above is unserviceable when the helicopter is about to begin a flight, the helicopter may nevertheless take-off on that flight if:

(1) It is not reasonably practical to repair or replace that item, before the commencement of the flight;

(2) The helicopter has not made more than one flight since the item was found to be unserviceable; and

(3) The commander has satisfied himself that, taking into account the latest information available as to the route/area and heliport or landing location to be used (including any planned diversion) and the weather conditions likely to be encountered, the flight can be made safely and in accordance with any relevant requirements of the appropriate air traffic control limit.

ANTR OPS 3.867 Surveillance Equipment

(a) A helicopter shall be provided with surveillance equipment which will enable it to operate in accordance with the requirements of air traffic services.

(b) For operations where surveillance equipment is required to meet an RSP specification for performance-based surveillance (PBS), a helicopter shall, in addition to the requirements specified in sub-paragraph (a);

(1) be provided with surveillance equipment which will enable it to operate in accordance with the prescribed RSP specification(s);

(2) have information relevant to the helicopter RSP specification capabilities listed in the flight manual or other helicopter documentation approved by the State of Design or the BCAA; and

(3) have information relevant to the helicopter RSP specification capabilities included in the MEL.

(c) The BCAA shall, for operations where an RSP specification for PBS has been prescribed, ensure that the operator has established and documented;

(1) normal and abnormal procedures, including contingency procedures;

(2) flight crew qualification and proficiency requirements, in accordance with appropriate RSP specifications;

(3) a training programme for relevant personnel consistent with the intended operations; and

(4) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RSP specifications.

(d) The BCAA shall ensure that, in respect of those helicopters mentioned in sub-paragraph (b), adequate provisions exist for;

(1) receiving the reports of observed surveillance performance issued by monitoring programmes; and

(2) taking immediate corrective action for individual aircraft, aircraft types or operators, identified in such reports as not complying with the RSP specification.

Note: 1 Information on surveillance equipment is contained in the Aeronautical Surveillance Manual (ICAO DOC 9924).

Note: 2 Information on RSP specifications for performance-based surveillance is contained in the Performance-based Communication and Surveillance (PBCS) Manual (ICAO DOC 9869).

ANTR OPS 3.870 *Intentionally blank*

ANTR OPS 3.873 Electronic Navigation Data Management

(a) The operator shall not use a navigation database which supports an airborne navigation application as a primary means of navigation unless the navigation database supplier holds a Type 2 Letter of Acceptance (LoA) or equivalent.

(b) If the operator's supplier does not hold a Type 2 LoA or equivalent, the operator shall not use the electronic navigation data products unless the BCAA has approved the operator's procedures for ensuring that the process applied and the delivered products have met equivalent standards of integrity.

(c) The operator shall not use electronic navigation data products for other navigation applications unless the BCAA has approved the operator's procedures for ensuring that the process applied and the delivered products have met acceptable standards of integrity and that the products are compatible with the intended function of the equipment that will use them.

(d) The operator shall continue to monitor both the process and the products according to the requirements of OPS 3.035.

(e) The operator shall implement procedures that ensure timely distribution and insertion of current and unaltered electronic navigation data to all aircraft that require it.

Note: Guidance relating to the processes that data suppliers may follow is contained in RTCA DO200A/EUROCAE ED-76 and RTCA DO-201A/EUROCAE ED-77.

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SUBPART M – HELICOPTER MAINTENANCE

ANTR OPS 3.880 General

(a) The operator shall not operate a helicopter unless it is maintained and released to service by an organisation appropriately approved/accepted in accordance with ANTR Part 145, except that pre-flight inspections need not necessarily be carried out by the ANTR Part-145 organisation.

Note: Helicopter continuing airworthiness requirements needed to comply with the operator certification requirements in ANTR OPS 3.180 are contained in ANTR M.

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SUBPART N – FLIGHT CREW

Note : *Whenever the use of flight simulator or Synthetic Training Device is required by this Subpart, it shall be approved in accordance with the requirements of ANTR-FSTD H.*

ANTR OPS 3.940 Composition of Flight Crew

(a) The operator shall ensure that:

(1) The composition of the flight crew and the number of flight crew members at designated crew stations are both in compliance with, and no less than the minimum specified in, the Helicopter Flight Manual;

(2) The flight crew includes additional flight crew members when required by the type of operation, and is not reduced below the number specified in the Operations Manual;

(3) All flight crew members hold an applicable and valid licence acceptable to the BCAA and are suitably qualified and competent to conduct the duties assigned to them;

(4) Procedures are established, acceptable to the BCAA, to prevent the crewing together of inexperienced flight crew members; (See AMC OPS 3.940(a)(4)); and

(5) One pilot amongst the flight crew is designated as the commander who may delegate the conduct of the flight to another suitably qualified pilot.

(6) When engaging the services of flight crew members who are self-employed and/or working on a freelance or part-time basis, the requirements of Subpart N are complied with.

(7) For crew members serving the operator as a commander, initial operator's Crew Resource Management (CRM) training shall be completed before commencing unsupervised line flying.

(b) *Pilots*. The operator shall ensure that:

(1) Commanders and co-pilots on an IFR flight hold a valid instrument rating, except that the holder of a pilot licence may fly in VMC at night, provided he is appropriately qualified for the circumstances, airspace and flight conditions in which the flight is conducted. This qualification requirement must be entered in the Operations Manual and be acceptable to the BCAA. (See IEM to ANTR OPS 3.940(b)(1)).

(2) For IFR operations using helicopters with a maximum approved passenger seating configuration (MAPSC) of more than 9:

(i) The minimum flight crew is two qualified pilots; and

(ii) The commander holds a valid Airline Transport Pilot's Licence (Helicopter) (ATPL(H));

(3) For operations using helicopters with a maximum approved passenger seating configuration (MAPSC) of more than 19:

(i) The minimum flight crew is two qualified pilots;

(ii) The commander holds a valid Airline Transport Pilot's Licence (Helicopter) (ATPL(H)).

(c) Helicopters not covered by sub-paragraph (b)(2) and (b)(3) above may be operated by a single pilot provided that the requirements of Appendix 1 to ANTR-OPS 3.940(c) are satisfied.

ANTR OPS 3.941 Training – General

The operator shall establish and maintain a ground and flight training programme, approved by the BCAA in accordance with this Subpart, which ensures that all flight crew members are adequately trained to perform their assigned duties. The training programme shall:

(a) include ground and flight training facilities and properly qualified instructors as determined by the BCAA;

(b) consist of ground and flight training for the type(s) of helicopter on which the flight crew member serves;

(c) include proper flight crew coordination and training for all types of emergency and abnormal situations or procedures caused by engine, transmission, rotor, airframe or systems malfunctions, fire or other abnormalities;

(d) include training in knowledge and skills related to the visual and instrument flight procedures for the intended area of operation, human performance and threat and error management, the transport of dangerous goods and, where applicable, procedures specific to the environment in which the helicopter is to be operated;

(e) ensure that all flight crew members know the functions for which they are responsible and the relation of these functions to the functions of other crew members, particularly in regard to abnormal or emergency procedures;

(f) include training in knowledge and skills related to the operational use of head-up display and/or enhanced vision systems for those helicopters so equipped; and

(g) be given on a recurrent basis, as determined by the BCAA and shall include an assessment of competence.

Note1: ANTR OPS 3.370 prohibits the in-flight simulation of emergency or abnormal situations when passengers or cargo are being carried.

Note 2: Flight training may, to the extent deemed appropriate by the State of the Operator, be given in flight simulation training devices approved by the State for that purpose.

Note 3: The scope of the recurrent training required by ANTR OPS 3.965 may be varied and need not be as extensive as the initial training given in a particular type of helicopter.

Note 4: The use of correspondence courses and written examinations as well as other means may, to the extent deemed feasible by the State of the Operator, be utilized in meeting the requirements for periodic ground training.

Note 5: For more information on dangerous goods operational requirements see SUBPART- R to ANTR OPS 3.

Note 6: Guidance material to design training programmes to develop knowledge and skills in human performance can be found in the Human Factors Training Manual (Doc 9683).

Note 7: Information for pilots and flight operations personnel on flight procedure parameters and operational procedures is contained in PANS-OPS (Doc 8168), Volume I. Criteria for the construction of visual and instrument flight procedures are contained in PANS-OPS (Doc 8168), Volume II. Obstacle clearance criteria and procedures used in certain States may differ from PANS-OPS, and knowledge of these differences is important for safety reasons.

Note 8: Guidance material to design flight crew training programmes can be found in the Manual of Evidence-based Training (Doc 9995).

Note 9: Guidance material on the different means used to assess competence can be found in the Attachment to Chapter 2 of the Procedures for Air Navigation Services — Training (PANS-TRG, Doc 9868).

(h) The requirement for recurrent flight training in a particular type of helicopter shall be considered fulfilled by:

(1) the use, to the extent deemed feasible by the BCAA, of flight simulation training devices approved by that State for that purpose; or

(2) the completion within the appropriate period of the proficiency check required by ANTR OPS 3.943, 3.945 and 3.965 in that type of helicopter.

ANTR OPS 3.943 Initial Operator's Crew Resource Management (CRM) training
(See AC No. 1 to ANTR OPS 3.943)
(See AC No. 2 to ANTR OPS 3.943)

(a) When a flight crew member has not previously completed initial Operator's Crew Resource Management (CRM) training (either new employees or existing staff), then the operator shall ensure that the flight crew member completes an initial CRM training course. Newemployees shall complete initial Operator's CRM Training within their first year of joiningthe operator.

(b) Initial CRM training shall be conducted by suitably qualified personnel (See AC-1 ANTR OPS 3.943).

(c) Initial CRM training is conducted in accordance with a detailed course syllabus included in the Operations Manual, and shall contain at least the following items:

(1) Human error and reliability, error chain, error prevention and detection;

(2) Company safety culture, Standard Operating Procedures (SOPs), organisational factors;

(3) Stress, stress management, fatigue and vigilance;

(4) Information acquisition and processing, situation awareness, workload management;

(5) Decision making;

(6) Communication and co-ordination inside and outside the cockpit;

(7) Leadership and team behaviour, synergy;

(8) Automation and philosophy of the use of Automation (if relevant to the type);

(9) Specific type-related differences;

(10) Case based studies;

(11) Additional areas which warrant extra attention, as identified by the safety management system (see ANTR OPS 3.037).

ANTR OPS 3.945 Conversion Training and checking
(See AMC OPS 3.945)
(See IEM OPS 3.945)
(See AC No. 1 to ANTR OPS 3.943)
(See AC No. 2 to ANTR OPS 3.943)

(a) The operator shall ensure that:

(1) A flight crew member completes a Type Rating course which satisfies the applicable requirements when changing from one type of helicopter to another type for which a new type rating is required;

(2) A flight crew member completes the operator's conversion course before commencing unsupervised line flying;

(i) When changing to a helicopter for which a new type rating is required; or

(ii) When changing operator;

(3) Conversion training is conducted by suitably qualified persons in accordance with a detailed course syllabus included in the Operations Manual.

(4) The amount of training required by the operator's conversion course is determined after due note has been taken of the flight crew member's previous training as recorded in his training records prescribed in ANTR OPS 3.985;

(5) The minimum standards of qualification and experience required of flight crew members before undertaking conversion training are specified in the Operations Manual;

(6) Each flight crew member undergoes the checks required by ANTR OPS 3.965(b) and the training and checks required by ANTR OPS 3.965(d) before commencing lineflying under supervision;

(7) Upon completion of line flying under supervision, the check required by ANTR OPS 3.965(c) is undertaken;

(8) Once the operator's conversion course has been commenced, a flight crew member does not undertake flying duties on another type until the course is completed or terminated unless otherwise approved by the BCAA (See IEM OPS 3.945(a)(8)); and

(9) Elements of CRM training are integrated into the conversion course. (See AC-1 ANTR OPS 3.943 and AC-2 ANTR OPS 3.943 and AC OPS 3.945(a)(9) and IEM OPS 3.945(a)(8)).

(b) In the case of changing helicopter type, the check required by 3.965(b) may be combined with the type rating skill test required.

(c) The operator's conversion course and the Type Rating course required may be combined.

ANTR OPS 3.950 Differences Training and Familiarisation training

(a) The operator shall ensure that a flight crew member completes:

(1) Differences training which requires additional knowledge and training on an appropriate training device:

(i) When operating a variant of a helicopter currently operated; or

(ii) When introducing a significant change of equipment and/or procedures on types or variants currently operated.

(2) Familiarisation training which requires the acquisition of additional knowledge:

(i) When operating another helicopter of the same type; or

(ii) When introducing a significant change of equipment and/or procedures on types or variants currently operated.

(b) The operator shall specify in the Operations Manual when such differences training or familiarisation training is required.

ANTR OPS 3.955 Upgrade to commander
(See Appendix 1 to ANTR-OPS 3.955)

(a) A pilot upgrading to commander shall complete an appropriate command course.

(b) The operator shall specify in the Operations Manual a minimum experience level for upgrade to commander from within the company and for those joining as direct entry commanders.

ANTR OPS 3.960 Commanders - Minimum Qualification Requirements

(a) The minimum qualification requirements for a commander are either:

(1) An Airline Transport Pilot Licence (Helicopter) (ATPL(H)); or

(2) A Commercial Pilot's Licence (Helicopter) (CPL(H) provided that:

(i) When conducting operations under instrument flight rules (IFR), the Commander has a minimum of 700 hours total flight time on helicopters which includes 300 hours as pilot-in-command and 100 hours under IFR. The 300hours as pilot-in-command may be substituted by co-pilot hours on a 2 for 1basis provided those hours were gained within an established two pilot crew concept system described in the Operations Manual;

(ii) When conducting operations under visual meteorological conditions (VMC) at night, a commander, without a valid instrument rating, has 300 hours total flight time on helicopters which includes 100 hours as pilot-in-command and 10 hours at night as pilot flying.

ANTR OPS 3.965 Recurrent Training and Checking
(See Appendix 1 to ANTR OPS 3.965)
(See AC No. 1 to ANTR OPS 3.943)
(See AC No. 2 to ANTR OPS 3.943)
(See AMC OPS 3.965)
(See IEM to Appendix 1 to ANTR 3.965)

(a) *General* - The operator shall ensure that:

(1) Each flight crew member undergoes recurrent training and checking and that all such training and checking is relevant to the type or variant of helicopter on which the crew member is certificated to operate;

(2) A recurrent training and checking programme is established in the Operations Manual and approved by the BCAA;

(3) Recurrent training is conducted by the following personnel:

(i) *Ground and refresher training* - by a suitably qualified person;

(ii) *Helicopter/flight simulator training* - by a Type Rating Instructor (TRI), or in the case of the flight simulator, a Synthetic Flight Instructor (SFI), provided that the TRI or SFI satisfies the operator's experience and knowledge requirements sufficient to instruct on the items specified in paragraphs (a)(1)(i)(A) and (B) of Appendix to ANTR OPS 3.965;

(iii) *Emergency and safety equipment training and checking* - by suitably qualified personnel; and

(iv) *Crew Resource Management (CRM) training* - by suitably qualified personnel.

(4) Recurrent checking is conducted by the following personnel:

(i) *Operator proficiency checks* - by a Type Rating Examiner (TRE) or a Flight Examiner (FE) with the appropriate type rating, nominated by the operator and acceptable to the BCAA or, a Synthetic Flight Examiner (SFE) if the check is conducted in a flight simulator approved for the purpose; and

(ii) *Line checks* - by suitably qualified commanders trained in the assessment of CRM skills (see AC-2 ANTR OPS 3.943 paragraph 4) nominated by the operator and acceptable to the BCAA;

(5) Each flight crew member undergoes operator proficiency checks as part of a normal flight crew complement.

(b) *Operator Proficiency Check*

(1) The operator shall ensure that:

(i) Each flight crew member undergoes operator proficiency checks to demonstrate his competence in carrying out normal, abnormal and emergency procedures; and

(ii) The check must be conducted without external visual references, as appropriate, when it is likely that the crew member will be required to operate under IFR.

(2) Except as stated in (3) below, the period of validity of the operator proficiency check shall be 6 calendar months in addition to the remainder of the month of issue. If issued within the final 2 calendar months of validity of a previous operator proficiency check, the period of validity shall extend from the date of issue until 6 calendar months from the expiry date of that previous operator proficiency check. Before a flight crew member, without a valid instrument rating, may operate VMC at night he will be required to undergo a proficiency check at night. Thereafter, each second proficiency check shall then be conducted at night.

(3) The period of validity of the operator proficiency check for private helicopters below a maximum certificated take-off mass of 5700 kg, shall be 12 calendar months in addition to the remainder of the month of issue. If issued within the final 2 calendar months of validity of a previous operator proficiency check, the period of validity shall extend from the date of issue until 12 calendar months from the expiry date of that previous operator proficiency check.

(c) *Line Check.* The operator shall ensure that each flight crew member undergoes a line check on the helicopter to demonstrate his competence in carrying out normal line operations described in the Operations Manual. The period of validity of a line check shall be 12calendar months, in addition to the remainder of the month of issue. If issued within the final 2 calendar months of validity of a previous line check the period of validity shall extend from the date of issue until 12 calendar months from the expiry date of that previous line check.

(d) *Emergency and Safety Equipment training and checking*. The operator shall ensure that each flight crew member undergoes training and checking on the location and use of all emergency and safety equipment carried. The period of validity of an emergency and safety equipment check shall be 12 calendar months in addition to the remainder of the month of issue. If issued within the final 2 calendar months of validity of a previous emergency and safety check, the period of validity shall extend from the date of issue until 12 calendar months from the expiry date of that previous emergency and safety equipment check.

(e) *CRM.* The operator shall ensure that;

(1) Elements of CRM are integrated into all appropriate phases of the recurrent training; and

(2) Each flight crew member undergoes specific modular CRM training. All major topicsof the initial CRM training shall be covered over a period not exceeding 3 years.

(f) *Ground and Refresher training*. The operator shall ensure that each flight crew member undergoes ground and refresher training at least every 12 calendar months. If the training is conducted within 2 calendar months prior to the expiry of the 12 calendar months period, the next ground and refresher training must be completed within 12 calendar months of the original expiry date of the previous ground and refresher training.

(g) *Helicopter/flight simulator training.* The operator shall ensure that each flight crew member undergoes helicopter/flight simulator training at least every 12 calendar months. If the training is conducted within 2 calendar months prior to the expiry of the 12 calendar months period, the next helicopter/flight simulator training must be completed within 12 calendar months of the original expiry date of the previous ground and refresher training.

ANTR OPS 3.968 Pilot qualification to operate in either pilot's seat
(See Appendix 1 to ANTR OPS 3.968)
(See AMC OPS 3.965)
(See IEM to Appendix 1 to ANTR 3.965)

(a) The operator shall ensure that:

(1) A pilot who may be assigned to operate in either pilot's seat completes appropriate training and checking; and

(2) The training and checking programme is specified in the Operations Manual and is acceptable to the BCAA.

ANTR OPS 3.970 Recent experience

(a) The operator shall ensure that, except as permitted in sub-paragraph (b) below:,

(1) A pilot does not operate a helicopter unless he has carried out at least three take-offs, three circuits and three landings as pilot flying in a helicopter of the same type, or a Flight Simulator, of the helicopter type to be used, in the preceding 90 days.

(2) For night VMC operations:

(i) a pilot without a valid instrument rating has carried out at least three take-offs, three circuits and three landings at night in the preceding 90 days. This recency may be obtained in a FSTD.

(ii) a pilot with a valid instrument rating satisfies the night recent experience requirement if he has carried out at least three instrument approaches in the preceding 90 days. This recency may be obtained in a FSTD.

(b) The 90 day period prescribed in sub-paragraph (a) above may be extended up to a maximum of 120 days by line flying under the supervision of a nominated commander.

ANTR OPS 3.975 Route/Role/Area - Competence Qualification
(See AMC OPS 3.975)

(a) The operator shall ensure that, prior to being assigned as commander or as pilot to whom the conduct of flight may be delegated by the commander on a route, in a role or an area, the pilot has obtained adequate knowledge of the route to be flown and of the heliports or landing locations (including alternates), facilities and procedures to be used. Each such pilot shall demonstrate to the operator an adequate knowledge of:

(1) the operation to be flown. This shall include knowledge of:

(i) the terrain and minimum safe altitudes;

(ii) the seasonal meteorological conditions;

(iii) the meteorological, communication and air traffic facilities, services and procedures;

(iv) the search and rescue procedures; and

(v) the navigation facilities and procedures associated with the route or area in which the flight is to take place; and

(2) procedures applicable to flight paths over heavily populated areas and areas of high air traffic density, obstructions, physical layout, lighting, approach aids and arrival, departure, holding and instrument approach procedures, and applicable operating minima.

(b) A pilot-in-command shall have made a flight, representative of the operation with which the pilot is to be engaged which shall include a landing at a representative heliport, as a member of the flight crew and accompanied by a pilot who is qualified for the operation.

(c) The operator shall not continue to utilise a pilot as a pilot-in-command on an operation in an area specified by the operator and approved by the BCAA unless, within the preceding 12 months, the pilot has made at least one representative flight as a pilot member of the flight crew, or as a check pilot, or as an observer on the flight deck. In the event that more than 12 months elapse in which a pilot has not made such a representative flight, prior to again serving as a pilot-in-command on that operation, that pilot shall requalify in accordance with sub-paragraphs (a) and (b) above.

(d) The period of validity of the route/role/area competence qualification shall be 12 calendar months in addition to the remainder of:

(1) The month of qualification; or

(2) The month of the latest operation on the route, in the role or area.

(e) The route/role/area competence qualification shall be revalidated by operating on the route, in the role or area within the period of validity prescribed in sub-paragraph (b) above.

(f) If revalidated within the final 2 calendar months of validity of previous route/role/area competence qualification, the period of validity shall extend from the date of revalidation until 12 calendar months from the expiry date of that previous route/role/area competence qualification.

ANTR OPS 3.978 *Intentionally blank*

ANTR OPS 3.980 Operation on more than one type or variant
(See AMC OPS 3.980)

(a) The operator shall ensure that a flight crew member does not operate more than one type or a variant unless:

(1) The flight crew member is competent to do so; and

(2) Appropriate procedures, approved by the BCAA are included in the Operations Manual.

ANTR OPS 3.985 Training Records
(See IEM OPS 3.985)

(a) The operator shall:

(1) Maintain records of all training, checking and qualification prescribed in ANTR OPS 3.945, 3.955, 3.965, 3.968 and 3.975 undertaken by a flight crew member; and

(2) Make the records of all conversion courses and recurrent training and checking available, on request, to the flight crew member concerned.

Appendix 1 to ANTR OPS 3.940(c)

Single pilot operations under IFR or at night

(a) Helicopters referred to in ANTR OPS 3.940(c) may be operated by a single pilot under IFR or at night when the following requirements are satisfied:

(1) The operator shall include in the Operations Manual a pilot's conversion and recurrent training programme which includes the additional requirements for a single pilot operation;

(2) Training and Recency. Attention shall be given to cockpit procedures, especially in respect of:

(i) Engine management and emergency handling;

(ii) Use of normal, abnormal and emergency checklist;

(iii) ATC communication;

(iv) Cockpit procedures in respect of departure and approach;

(v) Autopilot management, if applicable; and

(vi) Simplified in-flight documentation;

(3) The recurrent checks required by ANTR OPS 3.965 shall be performed in the single- pilot role on the particular helicopter type in an environment representative of the operation;

(4) The pilot shall meet the Commanders minimum qualification requirements of ANTR OPS 3.960.

(5) For IFR operations, the pilot shall have experience as follows:

(i) 25 hours total IFR flight experience in the relevant operating environment.

(ii) 25 hours flight experience on the specific type of helicopter, approved for single pilot IFR, of which 10 hours is as commander or commander under supervision, including 5 sectors of IFR line flying under supervision using the single pilot procedures.

(iii) The minimum required recent experience for a pilot engaged in a single-pilot operation under IFR shall be 5 IFR flights, including 3 instrument approaches, carried out during the preceding 90 days on a helicopter approved in the single-pilot role. This requirement may be replaced by an IFR instrument approach check on the helicopter or a FSTD.

Note: Additional equipment requirements for alleviating pilot workload are prescribed in ANTR OPS 3.655.

Appendix 1 to ANTR OPS 3.955

Upgrading to Commander

(a) *Upgrade Training Course*

(1) The command course required by ANTR OPS 3.955(a) must be specified in the Operations Manual and include at least the following:

(i) Training in a flight simulator (including Line Orientated Flying Training) and/or flying training including a proficiency check operating as commander;

(ii) Operator command responsibilities;

(iii) Line training in command under supervision. A minimum of 10 hours including at least 10 sectors is required for pilots already qualified on the helicopter type;

(iv) Completion of a commander's line check and route/role/area competency qualification.

(v) For initial upgrade to commander the course shall also include CRM. (See AC-1 ANTR OPS 3.943).

(2) *Combined Upgrading and Conversion Course*. If a pilot is converting from one helicopter type or variant to another when upgrading to commander:

(i) The Command Course shall also include a Conversion Course in accordance with ANTR OPS 3.945.

(ii) Additional sectors shall be required for a pilot transitioning on to a new type of helicopter.

Appendix 1 to ANTR OPS 3.965

Recurrent Training and Checking - Pilots
(See IEM to Appendix 1 to ANTR OPS 3.965)
(See AC No. 1 to ANTR OPS 3.943)
(See AC No. 2 to ANTR OPS 3.943)
(See IEM OPS 3.945)

(a) *Recurrent Training* - Recurrent training shall comprise:

(1) *Ground and refresher training*

(i) The ground and refresher training programme shall include:

(A) Helicopter systems;

(B) Operational procedures and requirements including ground de-/anti-icing and pilot incapacitation; and

(C) Accident/Incident and occurrence review.

(ii) Knowledge of the ground and refresher training shall be verified by a questionnaire or other suitable methods.

(2) *Helicopter/flight simulator training*

(i) The helicopter/flight simulator training programme shall be established such that all major failures of helicopter systems and associated procedures will be covered within a 3 year period.

(ii) When engine malfunctions are simulated, if no synthetic training device is available, these emergencies may be covered in the helicopter using a safe airborne simulation. In the event that such training is conducted in the helicopter, due consideration must be given to the effect of any subsequent failure and the exercise must be preceded by a comprehensive briefing.

(iii) Helicopter/flight simulator training may be combined with the operator proficiency check.

(3) *Emergency and Safety Equipment Training*

(i) The emergency and safety equipment training programme may be combinedwith emergency and safety equipment checking and shall be conducted in a helicopter or a suitable alternative training device.

(ii) Every year the emergency and safety equipment training programme must include the following:

(A) Actual donning of a lifejacket, where fitted;

(B) Actual donning of protective breathing equipment, where fitted;

(C) Actual handling of fire extinguishers, of the type used;

(D) Instruction on the location and use of all emergency and safety equipment carried on the helicopter;

(E) Instruction on the location and use of all types of exits; and

(F) Security procedures.

(iii) Every three years the programme of training must include the following:

(A) Actual operation of all types of exits;

(B) Actual fire-fighting using equipment representative of that carried in the helicopter on an actual or simulated fire except that, with Halonextinguishers, an alternative method acceptable to the BCAA may be used;

(C) The effects of smoke in an enclosed area and actual use of all relevant equipment in a simulated smoke-filled environment, if applicable;

(D) Demonstration in the use of the life-rafts where fitted, or, demonstration and use of the life-rafts where they are fitted for extended overwater operations (See AMC to Appendix 1 to ANTR OPS 3.965, sub-paragraph (a)(3)(iii)(D);

(E) First aid; appropriate to the helicopter type, the kind of operation and crew complement (particularly in the case when crew members are not carried); and

(F) when serving on helicopters operated above 3 000 m (10 000 ft), the effect of lack of oxygen and, in the case of pressurised helicopters, as regards physiological phenomena accompanying a loss of pressurisation.

(4) *CRM.*

(b) *Recurrent checking*. Recurrent checking shall comprise:

(1) *Operator proficiency checks*.

(i) Where applicable, proficiency checks must include the following abnormal/emergency procedures:

(A) Engine fire;

(B) Fuselage fire;

(C) Emergency operation of under carriage;

(D) Fuel dumping;

(E) Engine Failure and relight;

(F) Hydraulic failure;

(G) Electrical failure;

(H) Engine failure during take-off before decision point;

(I) Engine failure during take-off after decision point;

(J) Engine failure during landing before decision point;

(K) Engine failure during landing after decision point;

(L) Flight and engine control system malfunctions;

(M) Recovery from unusual attitudes;

(N) Landing with one or more engine(s) inoperative;

(O) IMC auto-rotation techniques;

(P) Auto-rotation to a designated area;

(Q) Pilot incapacitation; and

(R) Directional control failures and malfunctions.

(ii) For pilots required to engage in IFR operations proficiency checks include the following additional abnormal/emergency procedures:

(A) 3D instrument approach to minima with, in the case of multi-engined helicopters, a simulated failure of one engine;

(B) Go-around on instruments from minima with, in the case of multi-engined helicopters, a simulated failure of one engine;

(C) 2D instrument approach to minima;

(D) Landing with a simulated failure of one or more engines; and

(E) Where appropriate to the helicopter type, approach with flight control system/flight director system malfunctions, flight instrument andnavigation equipment failures.

(2) *Emergency and safety equipment checks*. The items to be checked shall be those for which training has been carried out in accordance with sub-paragraph (a)(3) above.

(3) *Line checks*;

(i) Line checks must establish the ability to perform satisfactorily a complete line operation including pre-flight and post-flight procedures and use of theequipment provided, as specified in the Operations Manual.

(ii) The flight crew must be assessed on their CRM skills for the purpose of;

(A) providing feedback to the crew collectively and individually; and

(B) improving the CRM training system.

(iii) When pilots are assigned duties as pilot flying and pilot non-flying they must be checked in both functions.

(iv) Line checks must be completed in a helicopter.

(v) The person conducting a line check, who is described in ANTR OPS3.965(a)(4)(ii), shall occupy an observer's seat whenever practical.

(4) *Single pilot operations*;

(i) The recurrent checks required by sub-paragraphs (1) to (3) above shall be performed in the single pilot role on a particular helicopter type in an environment representative of the operation.

Appendix 1 to ANTR OPS 3.968

Pilot qualification to operate in either pilot's seat

(a) Commanders whose duties also require them to carry out the duties of co-pilot, or commanders required to conduct training or examining duties, shall complete their proficiency checks respectively from left and right hand seats, on alternative proficiency checks, provided that when the type rating proficiency check is combined with the operator proficiency check the commander completes his training or checking from his normally occupied seat. All checks, from whatever seat, must be completed as prescribed in ANTR OPS 3.965(b)

(b) When engine-out manoeuvres are carried out in a helicopter, the engine failure must be simulated. When carried out in a single engine helicopter, the engine failure must be simulated and the training captain must carry out the autorotative landing respectively from left and right hand seats on alternative proficiency checks.

(c) When operating in the co-pilot's seat, the checks required by ANTR OPS 3.965 and ANTR OPS 3.968 for operating in the commander's seat must, in addition, be valid and current.

(d) A pilot relieving the commander shall have demonstrated, concurrent with the operator proficiency checks prescribed in ANTR OPS 3.965(b), practice of drills and procedures which would not, normally, be the relieving pilot's responsibility. Where the differences between left and right seats are not significant (for example because of use of autopilot) then practice may be conducted in either seat.

(e) A pilot other than the commander occupying the commander's seat shall demonstrate practice of drills and procedures, concurrent with the operator proficiency checks prescribed in ANTR OPS 3.965(b), which would otherwise have been the commander's responsibility acting as pilot non-flying. Where the differences between right and left seats are not significant (for example because of use of autopilot) then practice may be conducted in either seat.

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SUBPART O – CREW MEMBERS OTHER THAN FLIGHT CREW

ANTR OPS 3.988 Applicability

The operator shall ensure that all crew members, other than flight crew members, assigned by the operator to duties in the helicopter, comply with the requirements of this Subpart.

ANTR OPS 3.990 Assignment of Emergency Duties

The operator shall establish, to the satisfaction of the BCAA, the minimum number of cabin crew required for each type of helicopter, based on seating capacity or the number of passengers carried, which shall not be less than the minimum number established during certification, in order to effect asafe and expeditious evacuation of the helicopter, and the necessary functions to be performed in an emergency or a situation requiring emergency evacuation. The operator shall assign these functions for each type of helicopter.

ANTR OPS 3.995 Minimum requirements

(See AC OPS 3.995(b))

The operator shall ensure that each cabin crew member:

(a) is at least 18 years of age;

(b) has passed a medical examination or assessment at regular intervals as required by the BCAA so as to check the medical fitness to discharge his/her duties;

(c) has successfully completed initial training in accordance with ANTR OPS 1.1005 and holds an attestation of safety training;

(d) has completed the appropriate conversion and/or differences training covering at least the subjects listed in ANTR OPS 1.1010;

(e) shall undergo recurrent training in line with the provisions of ANTR OPS 1.1015;

(f) is competent to perform his/her duties in accordance with procedures specified in the Operations Manual.

ANTR OPS 3.1000 *Intentionally blank*

ANTR OPS 3.1005 Initial training

(See AC OPS 3.1005)

The operator shall ensure that each crew member successfully completes initial training, (which shall include appropriate elements of ANTR OPS 3.943), accepted by the BCAA, and the checking prescribed in ANTR OPS 3.1025 before undertaking conversion training.

At the discretion of the BCAA, the operator or the approved training organisation providing the training course, shall deliver an attestation of safety training to a cabin crew member after he/she has completed the initial safety training and successfully passed the check referred to in ANTR OPS 3.1025.

ANTR OPS 3.1010 Conversion and Differences Training
(See AC OPS 3.1010)

(a) The operator shall ensure that each crew member has completed appropriate training, as specified in the Operations Manual, before undertaking assigned duties as follows:

(1) Conversion training; A conversion course must be completed before being:

(i) First assigned by the operator to operate as a crew member; or

(ii) Assigned to operate another helicopter type; and

(2) Differences training. Differences training must be completed before operating:

(i) On a variant of a helicopter type currently operated; or

(ii) With different safety equipment, safety equipment location, equipment relevant to the crew member's duties, or normal and emergency procedures on currently operated helicopter types or variants.

(b) The operator shall determine the content of the conversion or differences training taking account of the crew member's previous training as recorded in the crew member's training records required by ANTR OPS 3.1035.

(c) The operator shall ensure that:

(1) Conversion training is conducted in a structured and realistic manner;

(2) Differences training is conducted in a structured manner; and

(3) Conversion training, and if necessary differences training, includes the use of all relevant equipment (including safety equipment) and emergency procedures applicable to the type or variant of helicopter and involves training and practice on either a representative training device or on the actual helicopter.

(4) Elements of CRM training are integrated into the conversion course.

(5) crew members, when serving on helicopters operated above 3 000 m (10 000 ft), are knowledgeable as regards the effect of lack of oxygen and, in the case of pressurised helicopters, as regards physiological phenomena accompanying a loss of pressurisation.

ANTR OPS 3.1012 Familiarisation flights

The operator shall ensure that, following completion of conversion training, each crew member undertakes familiarisation flight prior to operating as one of the crew members required by ANTR OPS3.

ANTR OPS 3.1015 Recurrent training

(See AC OPS 3.1015)

(a) The operator shall ensure that each crew member undergoes recurrent training, covering the actions assigned to each crew member in normal and emergency procedures and drills relevant to the type(s) and/or variant(s) of helicopter on which they operate.

(b) The operator shall ensure that the recurrent training and checking programme accepted by the BCAA includes theoretical and practical instruction, together with individual practice.

(c) The period of validity of recurrent training and the associated checking required by ANTR OPS 3.1025 shall be 12 calendar months in addition to the remainder of the month of issue. If issued within the final 2 calendar months of validity of a previous check, the period of validity shall extend from the date of issue until 12 calendar months from the expiry dateof that previous check.

(d) The operator shall ensure that:

(1) Elements of CRM are integrated into all appropriate phases of the recurrent training; and

(2) Each crew member undergoes specific modular CRM training. All major topics of the initial CRM training shall be covered over a period not exceeding 3 years.

ANTR OPS 3.1020 Refresher Training

(See AC OPS 3.1020)

(a) The operator shall ensure that each crew member who has been absent from all flying duties for more than 6 months completes refresher training specified in the Operations Manual

(b) The operator shall ensure that when a crew member has not been absent from all flying duties, but has not, during the preceding 6 months, undertaken duties on a type of helicopteras a crew member, before undertaking such duties on that type, the crew member either:

(1) Completes refresher training on the type; or

(2) Operates two re-familiarisation sectors.

ANTR OPS 3.1025 Checking

(See AC OPS 3.1025)

(a) The operator shall ensure that during or following completion of the training required by ANTR OPS 3.1005, 3.1010 and 3.1015, each crew member undergoes a check covering the training received in order to verify his proficiency in carrying out normal and emergency safety duties. These checks must be performed by personnel acceptable to the BCAA.

(b) The operator shall ensure that each crew member undergoes checks as follows:

(1) *Initial training*. (See AC OPS 3.1005);

(2) *Conversion and Differences training*. (See AC OPS 3.1010); and

(3) *Recurrent training*. (See AC OPS 3.1015).

(4) *Refresher training*. (See AC OPS 3.1020).

ANTR OPS 3.1030 Operation on more than one type or variant

(a) The operator shall ensure that each crew member does not operate on more than three helicopter types except that, with the approval of the BCAA, the crew member may operate on four helicopter types, provided that safety equipment and emergency procedures for at least two of the types are similar.

(b) For the purposes of sub-paragraph (a) above, variants of a helicopter type are considered to be different types if they are not similar in all the following aspects:

(1) Emergency exit operation;

(2) Location and type of safety equipment; and

(3) Emergency procedures.

ANTR OPS 3.1035 Training records

(a) The operator shall:

(1) Maintain records of all training and checking required by ANTR OPS 3.1005, 3.1010, 3.1015, 3.1020 and 3.1025; and

(2) keep a copy of the attestation of safety training; and

(3) keep the training records and records of medical examinations or assessments up to date, showing in the case of the training records the dates and contents of the conversion, differences and recurrent training received; and

(4) Make the records of all initial, conversion and recurrent training and checking available, on request, to the crew member concerned.

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SUBPART P – MANUALS, LOGS AND RECORDS

ANTR OPS 3.1040 General Rules for Operations Manuals

(a) The operator shall ensure that the Operations Manual contains all instructions and information necessary for operations personnel to perform their duties.

(b) The operator shall ensure that the contents of the Operations Manual, including all amendments or revisions, do not contravene the conditions contained in the Air Operator Certificate (AOC) or any applicable regulations and are acceptable to, or, where applicable, approved by, the BCAA. (See IEM OPS 3.1040(b).)

(c) Unless otherwise approved by the BCAA, the operator must prepare the Operations Manual in the English language. In addition, the operator may translate and use that manual, or parts thereof, into another language. (See IEM OPS 3.1040(c).)

(d) Should it become necessary for the operator to produce new Operations Manuals or major parts/volumes thereof, he must comply with sub-paragraph (c) above.

(e) The operator may issue an Operations Manual in separate volumes.

(f) The operator shall ensure that all operations personnel have easy access to a copy of each part of the Operations Manual which is relevant to their duties. In addition, the operator shall supply crew members with a personal copy of, or sections from, Parts A and B of the Operations Manual as are relevant for personal study.

(g) The operator shall ensure that the Operations Manual is amended or revised so that the instructions and information contained therein are kept up to date. The operator shall ensure that all operations personnel are made aware of such changes that are relevant to their duties.

(h) Each holder of an Operations Manual, or appropriate parts of it, shall keep it up to date with the amendments or revisions supplied by the operator.

(i) The operator shall supply the BCAA with intended amendments and revisions in advance of the effective date. When the amendment concerns any part of the Operations Manual which must be approved in accordance with ANTR OPS 3, this approval shall be obtained before the amendment becomes effective. When immediate amendments or revisions are required in the interest of safety, they may be published and applied immediately, provided that any approval required has been applied for.

(j) The operator shall incorporate all amendments and revisions required by the BCAA.

(k) The operator must ensure that information taken from approved documents, and any amendment of such approved documentation, is correctly reflected in the Operations Manual and that the Operations Manual contains no information contrary to any approved documentation. However, this requirement does not prevent the operator from using more conservative data and procedures.

(l) The operator must ensure that the contents of the Operations Manual are presented in a form in which they can be used without difficulty. The design of the manual shall observe Human Factors and CRM principles.

(m) The operator may be permitted by the BCAA to present the Operations Manual or parts thereof in a form other than on printed paper. In such cases, an acceptable level of accessibility, usability and reliability must be assured.

(n) The use of an abridged form of the Operations Manual does not exempt the operator from the requirements of ANTR OPS 3.130.

ANTR OPS 3.1045 Operations Manual - structure and contents
(See Appendix 1 to OPS 3.1045)
(See AMC OPS 3.1045)

(a) The operator shall ensure that the main structure of the Operations Manual is as follows:

Part A. *General/Basic*

This part shall comprise all non type-related operational policies, instructions andprocedures needed for a safe operation.

Part B. *Helicopter Operating Matters*

This part shall comprise all type-related instructions and procedures needed for a safe operation. It shall take account of any differences between types, variants or individual helicopters used by the operator.

Part C. *Route/Role/Area and Heliport or Landing Location Instructions and Information*

This part shall comprise all instructions and information needed for the area of operation.

Part D. *Training*

This part shall comprise all training instructions for personnel required for a safe operation.

(b) The operator shall ensure that the contents of the Operations Manual are in accordance with Appendix 1 to ANTR OPS 3.1045 and relevant to the area(s) and type(s) of operation.

(c) The operator shall ensure that the detailed structure of the Operations Manual is acceptable to the BCAA. (See IEM OPS 3.1045(c).)

ANTR OPS 3.1050 Helicopter Flight Manual

The operator shall keep a current approved Helicopter Flight Manual or equivalent document for each helicopter that it operates.

ANTR OPS 3.1055 Journey log

(a) The operator shall retain the following information for each flight in the form of a Journey Log:

(1) Helicopter registration;

(2) Date;

(3) Name(s) of crew member(s);

(4) Duty assignment of crew member(s);

(5) Place of departure;

(6) Place of arrival;

(7) Time of departure;

(8) Time of arrival;

(9) Hours of flight;

(10) Nature of flight;

(11) Incidents, observations (if any); and

(12) Commander's signature (or equivalent) (see IEM OPS 3.1055 (a)(12)).

(b) The operator may be permitted not to keep a helicopter journey log, or parts thereof, by the BCAA if the relevant information is available in other documentation. (See IEM OPS 3.1055(b).)

ANTR OPS 3.1060 Operational flight plan

(a) The operator must ensure that the operational flight plan used and the entries made during flight contain the following items:

(1) Helicopter registration;

(2) Helicopter type and variant;

(3) Date of flight;

(4) Flight identification;

(5) Names of flight crew members;

(6) Duty assignment of flight crew members;

(7) Place of departure;

(8) Time of departure;

(9) Place of arrival (planned and actual);

(10) Time of arrival;

(11) Type of operation (VFR, HEMS, etc.);

(12) Route and route segments with checkpoints/waypoints, distances, time and tracks;

(13) Planned cruising speed and flying times between check-points/way-points. Estimated and actual times overhead;

(14) Safe altitudes and minimum levels;

(15) Planned altitudes and flight levels;

(16) Fuel calculations (records of in-flight fuel checks);

(17) Fuel on board when starting engines;

(18) Alternate(s) for destination and, where applicable, take-off and en-route, including information required in sub-paragraphs (12), (13), (14), and (15) above;

(19) Initial ATS Flight Plan clearance and subsequent re-clearance;

(20) In-flight re-planning calculations; and

(21) Relevant meteorological information.

(b) Items which are readily available in other documentation or from an acceptable source or are irrelevant to the type of operation may be omitted from the operational flight plan.

(c) The operator must ensure that the operational flight plan and its use is described in the Operations Manual.

(d) The operator shall ensure that all entries on the operational flight plan are made concurrently and that they are permanent in nature.

(e) The operational flight plan shall be completed for every intended flight and shall be approved by the pilot in command, and where applicable, by the flight operations officer/flight dispatcher.

(f) The operator shall determine the most efficient means of lodging the operational flight plan.

ANTR OPS 3.1065 Document storage periods

The operator shall ensure that all records and all relevant operational and technical information for each individual flight, are stored for the periods prescribed in Appendix 1 to ANTR OPS 3.1065.

ANTR OPS 3.1070 Operator's maintenance management exposition

The operator shall keep a current approved maintenance management exposition as prescribed in ANTR M.A.704 Continuing airworthiness management exposition.

ANTR OPS 3.1071 Helicopter Technical log

The operator shall keep a helicopter technical log as prescribed in ANTR M.A.306-Operator’s technical log system.

Appendix 1 to ANTR OPS 3.1045

Operations Manual Contents

(See IEM to Appendix 1 to ANTR OPS 3.1045)

The operator shall ensure that the Operations Manual contains the following:

A GENERAL/BASIC

0 ADMINISTRATION AND CONTROL OF OPERATIONS MANUAL

0.1 *Introduction*

(a) A statement that the manual complies with all applicable regulations and with the terms and conditions of the applicable Air Operator Certificate/Authorisation.

(b) A statement that the manual contains operational instructions that are to be complied with by the relevant personnel.

(c) A list and brief description of the various parts, their contents, applicability and use.

(d) Explanations and definitions of terms and words needed for the use of the manual.

0.2 *System of amendment and revision*

(a) Who is responsible for the issuance and insertion of amendments and revisions.

(b) A record of amendments and revisions with insertion dates and effective dates.

(c) A statement that handwritten amendments and revisions are not permitted except in situations requiring immediate amendment or revision in the interest of safety.

(d) A description of the system for the annotation of pages and their effective dates.

(e) A list of effective pages.

(f) Annotation of changes (on text pages and, as far as practicable, on charts and diagrams).

(g) Temporary revisions.

(h) A description of the distribution system for the manuals, amendments and revisions.

1 ORGANISATION AND RESPONSIBILITIES

1.1 *Organisational structure*. A description of the organisational structure including the general company organigram and operations department organigram. The organigram must depict the relationship between the Operations Department and the other Departments of the company. In particular, the subordination and reporting lines of all Divisions, Departments etc., which pertain to the safety of flight operations, must be shown.

1.2 *Nominated postholders*. The name of each nominated postholder responsible for flight operations, the maintenance system, crew training and ground operations, as prescribed in ANTR OPS 3 Subpart C. A description of their function and responsibilities must be included.

1.3 *Responsibilities and duties of operations management personnel*. A description of the duties, responsibilities and authority of operations management personnel pertaining to the safety of flight operations and the compliance with the applicable regulations.

1.4 *Authority, duties and responsibilities of the commander*. A statement defining the BCAA, duties and responsibilities of the commander.

1.5. *Duties and responsibilities of crew members other than the commander*

2 OPERATIONAL CONTROL AND SUPERVISION

2.1 *Supervision of the operation by the operator*. A description of the system for supervision of the operation by the operator (see ANTR OPS 3.175(g)). This must show how the safety of flight operations and the qualifications of personnel are supervised. In particular, the procedures related to the following items must be described:

(a) Licence and qualification validity;

(b) Competence of operations personnel; and

(c) Control, analysis and storage of records, flight documents, additional information and data.

2.2 *System of promulgation of additional operational instructions and information*. A description of any system for promulgating information which may be of an operational nature but is supplementary to that in the Operations Manual. The applicability of this information and the responsibilities for its promulgation must be included.

2.3 *Safety management system*. A description of the main aspects of the flight safety programme.

2.4 *Operational control*. A description of the procedures and responsibilities necessary to exercise operational control with respect to flight safety.

2.5 *Powers of the BCAA.*

A description of the powers of the BCAA.

3 QUALITY SYSTEM

A description of the quality system adopted including at least:

(a) Quality policy;

(b) A description of the organisation of the Quality System; and

(c) Allocation of duties and responsibilities.

4 CREW COMPOSITION

4.1 *Crew Composition*. An explanation of the method for determining crew compositions taking account of the following:

(a) The type of helicopter being used;

(b) The area and type of operation being undertaken;

(c) The phase of the flight;

(d) The minimum crew requirement and flight duty period planned;

(e) Experience (total and on type), recency and qualification of the crew members; and

(f) The designation of the commander.

(g) The designation of the senior cabin crew member.

4.2 *Intentionally blank*

4.3 *Flight crew incapacitation*. Instructions on the succession of command in the event of flight crew incapacitation.

4.4 *Operation on more than one type.* A statement indicating which helicopters are considered as one type for the purpose of:

(a) Flight crew scheduling; and

(b) Cabin crew scheduling.

5 QUALIFICATION REQUIREMENTS

5.1 A description of the required licence, rating(s), qualification/competency (e.g. for routes and aerodromes), experience, training, checking and recency for operations personnel to conduct their duties. Consideration must be given to the helicopter type, kind of operation and composition of thecrew.

5.2 *Flight crew*

(a) Commander.

(b) Pilot relieving the commander.

(c) Co-pilot.

(d) Pilot under supervision.

(e) System panel operator.

(f) Operation on more than one type or variant.

5.3 *Cabin crew*

(a) Senior cabin crew member.

(b) Cabin crew member.

(i) Required cabin crew member.

(ii) Additional cabin crew member and cabin crew member during familiarisation flights.

(c) Operation on more than one type or variant.

5.4 *Training, checking and supervision personnel*

(a) For flight crew.

(b) For cabin crew.

5.5 *Other operations personnel*

6 CREW HEALTH PRECAUTIONS

6.1 *Crew health precautions*. The relevant regulations and guidance to crew members concerning health including:

(a) Psychoactive substances including but not limited to:

(i) Anti depressants;

(ii) Alcohol and other intoxicating liquids;

(iii) Narcotics;

(iv) Drugs; and

(v) Sleeping tablets.

(See also ANTR-FCL 3 (medical) - 3.035 & 3.040)

(b) Pharmaceutical preparations;

(c) Immunisation;

(d) Diving involving underwater pressure breathing devices;

(e) Blood/bone marrow donation;

(f) Meal precautions prior to and during flight;

(g) Sleep and rest; and

(k) Surgical operations.

7 FLIGHT TIME LIMITATIONS

7.1 *Flight and Duty Time Limitations and Rest Requirements*. A description of the flight and duty time limitations and rest requirements prescribed in OPS Part 3 Subpart Q as applicable to the operation.

7.2 *Exceedances of flight and duty time limitations and/or reductions of rest periods* . Conditions under which flight and duty time may be exceeded or rest periods may be reduced and the procedures used to report these modifications.

8 OPERATING PROCEDURES

8.1 *Flight Preparation Instructions*. As applicable to the operation:

8.1.1 *Minimum Flight Altitudes*. A description of the method of determination and application of minimum altitudes including:

(a) A procedure to establish the minimum altitudes/flight levels for VFR flights; and

(b) A procedure to establish the minimum altitudes/flight levels for IFR flights.

8.1.2 *Criteria for determining the usability of aerodromes*

8.1.3 *Methods for the determination of aerodrome operating minima*. The method for establishing aerodrome operating minima for IFR flights in accordance with OPS Part 3 Subpart E. Reference must be made to procedures for the determination of the visibility and/or runway visual range and for the applicability of the actual visibility observed by the pilots, the reported visibility and the reported runway visual range.

8.1.4 En-route Operating Minima for VFR Flights or VFR portions of a flight and, where single engined helicopters are used, instructions for route selection with respect to the availability of surfaces which permit a safe forced landing.

8.1.5 *Presentation and Application of Aerodrome and En-route Operating Minima*

8.1.6 *Interpretation of meteorological information*. Explanatory material on the decoding of MET forecasts and MET reports relevant to the area of operations, including the interpretation of conditional expressions.

8.1.7 *Determination of the quantities of fuel, oil and water methanol carried*. The methods by which the quantities of fuel, oil and water methanol to be carried are determined and monitored in flight. This section must also include instructions on the measurement and distribution of the fluid carried on board. Such instructions must take account of all circumstances likely to be encountered on the flight, including the possibility of in-flight replanning and of failure of one or more of the helicopter's power plants. The system for maintaining fuel and oil records must also be described.

8.1.8 *Mass and Centre of Gravity*. The general principles of mass and centre of gravity including:

(a) Definitions;

(b) Methods, procedures and responsibilities for preparation and acceptance of mass and centre of gravity calculations;

(c) The policy for using either standard and/or actual masses;

(d) The method for determining the applicable passenger, baggage and cargo mass;

(e) The applicable passenger and baggage masses for various types of operations and helicopter type;

(f) General instruction and information necessary for verification of the various types of mass and balance documentation in use;

(g) Last Minute Changes procedures;

(h) Specific gravity of fuel, oil and water methanol;

(i) Seating policy/procedures; and

(j) Standard load plans.

8.1.9 *ATS Flight Plan*. Procedures and responsibilities for the preparation and submission of the air traffic services flight plan. Factors to be considered include the means of submission for both individual and repetitive flight plans.

8.1.10 *Operational Flight Plan*. Procedures and responsibilities for the preparation and acceptance of the operational flight plan. The use of the operational flight plan must be described including samples of the operational flight plan formats in use.

8.1.11 *Operator's Helicopter Technical Log*. The responsibilities and the use of the operator's Helicopter Technical Log must be described, including samples of the format used.

Note: Two examples of acceptable ways to fulfil the requirement for a Technical Log are given in attachments 1 and 2 to AC to Appendix 1 to ANTR OPS 1.005(a), where a so called Flight Log is presented. (See attachments)

8.1.12 *List of documents, forms and additional information to be carried*

8.2 *Ground Handling Instructions*

8.2.1 *Fuelling procedures*. A description of fuelling procedures, including:

(a) Safety precautions during refuelling and defueling including rotors running, engine(s) running and when an APU is in operation;

(b) Refuelling and defueling when passengers are embarking, on board or disembarking; and

(c) Precautions to be taken to avoid mixing fuels.

8.2.2 *Helicopter, passengers and cargo handling procedures related to safety* . A description of the handling procedures to be used when allocating seats and embarking and disembarking passengers and when loading and unloading the helicopter. Further procedures, aimed at achieving safety whilst the helicopter is on the ramp, must also be given. Handling procedures must include:

(a) Children/infants, sick passengers and Persons with Reduced Mobility;

(b) Transportation of inadmissible passengers, deportees or persons in custody;

(c) Permissible size and weight of hand baggage;

(d) Loading and securing of items in the helicopter;

(e) Special loads and classification of load compartments;

(f) Positioning of ground equipment;

(g) Operation of helicopter doors;

(h) Safety on the ramp, including fire prevention, blast and suction areas;

(i) Start-up, ramp departure and arrival procedures;

(j) Servicing of helicopters; and

(k) Documents and forms for helicopter handling;

(l) Multiple occupancy of helicopter seats.

8.2.3 *Procedures for the refusal of embarkation*. Procedures to ensure that persons who appear to be intoxicated or who demonstrate by manner or physical indications that they are under the influence of drugs, except medical patients under proper care, are refused embarkation.

8.2.4 *De-icing and Anti-icing on the ground*. A description of the de-icing and anti-icing policy and procedures for helicopters on the ground. These shall include descriptions of the types and effects of icing and other contaminants on helicopters whilst stationary, during ground movements and during take-off. In addition, a description of the fluid types used must be given including:

(a) Proprietary or commercial names;

(b) Characteristics;

(c) Effects on helicopter performance;

(d) Hold-over times; and

(e) Precautions during usage.

8.3 *Flight Procedures*

8.3.1 *VFR/IFR Policy*. A description of the policy for allowing flights to be made under VFR, or of requiring flights to be made under IFR, or of changing from one to the other.

8.3.2 *Navigation Procedures*. A description of all navigation procedures relevant to the type(s) and area(s) of operation. Consideration must be given to:

(a) Standard navigational procedures including policy for carrying out independent cross- checks of keyboard entries where these affect the flight path to be followed by the helicopter;

(b) NAT HLA and POLAR navigation and navigation in other designated areas;

(c) RNAV. A description of the relevant RNAV procedures specified in Part C;

(d) In-flight replanning; and

(e) Procedures in the event of system degradation.

8.3.3 *Altimeter setting procedures*

8.3.4 *Audio voice alerting device*

8.3.5 *Intentionally blank*

8.3.6 *Intentionally blank*

8.3.7 *Policy and procedures for in-flight fuel management*

8.3.8 *Adverse and potentially hazardous atmospheric conditions*. Procedures for operating in, and/or avoiding, potentially hazardous atmospheric conditions including:

(a) Thunderstorms;

(b) Icing conditions;

(c) Turbulence;

(d) Windshear;

(e) Jet stream;

(f) Volcanic ash clouds;

(g) Heavy precipitation;

(h) Sand storms;

(i) Mountain waves; and

(j) Significant Temperature inversions.

8.3.9 *Wake Turbulence and Rotor Downwash*. Wake turbulence and rotor downwash separation, taking into account helicopter types, wind conditions and FATO location.

8.3.10 *Crew members at their stations*. The requirements for crew members to occupy their assigned stations or seats during the different phases of flight or whenever deemed necessary in the interest of safety.

8.3.11 *Use of safety belts for crew and passengers*. The requirements for crew members and passengers to use safety belts and/or harnesses during the different phases of flight or whenever deemed necessary in the interest of safety.

8.3.12 *Admission to Cockpit*. The conditions for the admission to the cockpit of persons other than the flight crew. The policy regarding the admission of Inspectors from the BCAA must also be included.

8.3.13 *Use of vacant crew seats*. The conditions and procedures for the use of vacant crew seats.

8.3.14 *Incapacitation of crew members*. Procedures to be followed in the event of incapacitation of crew members in flight. Examples of the types of incapacitation and the means for recognising them must be included.

8.3.15 *Cabin Safety Requirements*. Procedures covering:

(a) Cabin preparation for flight, in-flight requirements and preparation for landing including procedures for securing cabin and galleys;

(b) Procedures to ensure that passengers are seated where, in the event that an emergency evacuation is required, they may best assist and not hinder evacuation from the helicopter;

(c) Procedures to be followed during passenger embarkation and disembarkation;

(d) Procedures in the event of fuelling with passengers on board or embarking and disembarking; and

(e) Smoking on board.

8.3.16 *Passenger briefing procedures*. The contents, means and timing of passenger briefing in accordance with ANTR OPS 3.285.

8.3.17 Other Policy and Procedures. The addition of policy and procedures for the following;

(a) Implementation of Flight Manual changes made mandatory or approved by the BCAA or State of Registry;

(b) Retention of Flight Recorder recording and flight recorders in safe custody pending disposition in accordance with ANTR Part VI.

(c) Standard Operating Procedures for each phase of flight

(d) Instructions on the clarification and acceptance of air traffic clearances particularly where terrain clearance is involved;

(d) Recording and reporting by flight crew on routine meteorological observations during en-route and climb phases of the flight and special and other non-routine observations during any phase of flight; and

(e) Recording and reporting by flight crew on volcanic activity.

8.3.18 The operations procedure shall ensure that the Commander shall not take off unless the helicopter has been inspected for icing and, if necessary, has been given appropriate de-icing/anti-icing treatment and when the flight planned to be operated or expected to operate in suspected or known ground icing conditions.

8.4 *AWO*. A description of the operational procedures associated with All Weather Operations. (See OPS Part 3 Subparts D & E) including instructions and requirements for the use of automatic landing systems, or equivalent displays and EVS, SVS or CVS equipment as applicable.

Instruction for the use of aerodrome operating minima for instrument approaches applicable to the use of eligible equipment for operational credit

8.5 *Intentionally blank*

8.6 *Use of the Minimum Equipment and Configuration Deviation List(s)*

8.7 *Non revenue flights*. Procedures and limitations for:

(a) Training flights;

(b) Test flights;

(c) Delivery flights;

(d) Ferry flights;

(e) Demonstration flights; and

(f) Positioning flights,

including the kind of persons who may be carried on such flights.

8.8 *Oxygen Requirements*

8.8.1 An explanation of the conditions under which oxygen must be provided and used.

8.8.2 The oxygen requirements specified for:

(a) Flight crew;

(b) Cabin crew; and

(c) Passengers.

9 DANGEROUS GOODS AND WEAPONS

9.1 Information, instructions and general guidance on the transport of dangerous goods including:

(a) Operator's policy on the transport of dangerous goods;

(b) Guidance on the requirements for acceptance, labelling, handling, stowage and segregationof dangerous goods;

(c) Procedures for responding to emergency situations involving dangerous goods;

(d) Duties of all personnel involved as per ANTR OPS 3.1215; and

(e) Instructions on the carriage of the operator's employees.

9.2 The conditions under which weapons, munitions of war and sporting weapons may be carried.

10 SECURITY

10.1 Security instructions and guidance of a non-confidential nature which must include the BCAA and responsibilities of operations personnel. Policies and procedures for handling and reporting crime on board such as unlawful interference, sabotage, bomb threats, and hijacking must also be included.

10.2 A description of preventative security measures and training.

Note: Parts of the security instructions and guidance may be kept confidential.

11 HANDLING OF ACCIDENTS AND OCCURRENCES

Procedures for the handling, notifying and reporting occurrences. This section must include:

(a) Definitions of occurrences and of the relevant responsibilities of all persons involved;

(b) Illustrations of forms used for reporting all types of occurrences (or copies of the forms themselves), instructions on how they are to be completed, the addresses to which they should be sent and the time allowed for this to be done;

(c) In the event of an accident, descriptions of which company departments, Authorities and other organizations that have to be notified, how this will be done and in what sequence;

(d) Procedures for verbal notification to air traffic service units of incidents involving ACAS RAs, bird hazards, dangerous goods and hazardous conditions;

(e) Procedures for submitting written reports on air traffic incidents, ACAS RAs, bird strikes, dangerous goods incidents or accidents, and unlawful interference;

(f) Reporting procedures to ensure compliance with ANTR OPS 3.085(b) and 3.420. These procedures must include internal safety related reporting procedures to be followed by crew members, designed to ensure that the commander is informed immediately of any incident that has endangered, or may have endangered, safety during flight and that he is provided with all relevant information.

12 RULES OF THE AIR

Rules of the Air including:

(a) Visual and instrument flight rules;

(b) Territorial application of the Rules of the Air;

(c) Communication procedures including COM-failure procedures;

(d) Information and instructions relating to the interception of civil helicopters;

(e) The circumstances in which a radio listening watch is to be maintained;

(f) Signals;

(g) Time system used in operation;

(h) ATC clearances, adherence to flight plan and position reports;

(i) Visual signals used to warn an unauthorised helicopter flying in or about to enter a restricted, prohibited or danger area;

(j) Procedures for pilots observing an accident or receiving a distress transmission;

(k) The ground/air visual codes for use by survivors, description and use of signal aids; and

(l) Distress and urgency signals.

13 **LEASING.**

A description of the operational arrangements for leasing, associated procedures and management responsibilities.

B HELICOPTER OPERATING MATTERS – TYPE RELATED

Taking account of the differences between types, and variants of types, under the following headings:

0 GENERAL INFORMATION AND UNITS OF MEASUREMENT

0.1 General Information (e.g. helicopter dimensions), including a description of the units of measurement used for the operation of the helicopter type concerned and conversion tables.

1 LIMITATIONS

1.1 A description of the certified limitations and the applicable operational limitations including:

(a) Certification status (e.g. ~~FAR~~ 14 CFR PART /CS-27, ~~FAR~~ 14 CFR PART /CS-29, ICAO Annex 16 (CS-34 and CS-36)etc.);

(b) Passenger seating configuration for each helicopter type including a pictorial presentation;

(c) Types of operation that are approved (e.g. IFR/VFR, CAT II/III, PBN, flights in known icing conditions etc.);

(d) Crew composition;

(e) Mass and centre of gravity;

(f) Speed limitations;

(g) Flight envelope(s);

(h) Wind limits;

(i) Performance limitations for applicable configurations;

(j) Slope;

(k) Airframe contamination;

(l) System limitations.

2 EMERGENCY PROCEDURES

2.1 The emergency procedures and duties assigned to the crew, the appropriate check-lists, the system for use of the check-lists and a statement covering the necessary coordination procedures between flight and other crew members the design and utilisation of which shall observe Human Factors and CRM principles. The following emergency procedures and duties must be included:

(a) Crew Incapacitation;

(b) Fire and Smoke Drills;

(c) Lightning Strikes;

(d) Distress Communications and alerting ATC to Emergencies;

(e) Engine failure;

(f) System failures;

(g) Guidance for Diversion in case of Serious Technical Failure;

(h) AVAD warning;

(i) Windshear;

(j) Emergency Landing/Ditching;

3 NORMAL PROCEDURES

3.1 The normal procedures and duties assigned to the crew, the appropriate check-lists, the system for use of the check-lists and a statement covering the necessary coordination procedures between flight and cabin crew. The following normal procedures and duties must be included:

(a) Pre-flight;

(b) Pre-departure;

(c) Altimeter setting and checking;

(d) Taxy, Take-Off and Climb;

(e) Noise abatement;

(f) Cruise and descent;

(g) Approach, Landing preparation and briefing;

(h) VFR Approach;

(i) IFR approach;

(j) Visual Approach and circling;

(k) Missed Approach;

(l) Normal Landing;

(m) Post Landing.

4 PERFORMANCE

4.0 *Performance data must be provided in a form in which it can be used without difficulty.*

4.1 *Performance data*. Performance material which provides the necessary data for compliance with the performance requirements prescribed in Subparts F, G H and I.

4.2 If performance Data, as required for the appropriate performance class, is not available in the approved HFM, then other data acceptable to the BCAA must be included. Alternatively, the Operations Manual may contain cross-reference to the approved data contained in the HFM where such data is not likely to be used often or in an emergency.

5 MASS AND BALANCE

Instructions and data for the calculation of the mass and balance including:

(a) Calculation system (e.g. Index system);

(b) Information and instructions for completion of mass and balance documentation, including manual and computer generated types;

(c) Limiting masses and centre of gravity for the types, variants or individual helicopters used by the operator; and

(d) Dry Operating mass and corresponding centre of gravity or index.

6 LOADING

Procedures and provisions for loading and securing the load in the helicopter.

7 FLIGHT PLANNING

7.1 Data and instructions necessary for pre-flight and in-flight planning. Where applicable, procedures for engine(s) out operations and flights to isolated heliports or landing locations must be included.

7.2 The method for calculating fuel needed for the various stages of flight, in accordance with ANTR OPS 3.255.

8 CONFIGURATION DEVIATION LIST

The Configuration Deviation List(s) (CDL), if provided by the manufacturer, taking account of the helicopter types and variants operated including procedures to be followed when a helicopter is being despatched under the terms of its CDL.

9 MINIMUM EQUIPMENT LIST

The Minimum Equipment List (MEL) taking account of the helicopter types and variants operated and the type(s)/area(s) of operation. The MEL must include the navigational equipment and take into account the required navigation performance for the route and area of operation.

10 SURVIVAL AND EMERGENCY EQUIPMENT INCLUDING OXYGEN

10.1 A list of the survival equipment to be carried for the routes to be flown and the procedures for checking the serviceability of this equipment prior to take-off. Instructions regarding the location, accessibility and use of survival and emergency equipment and its associated check list(s) must also be included.

10.2 The procedure for determining the amount of oxygen required and the quantity that is available. The flight profile and number of occupants.

11 EMERGENCY EVACUATION PROCEDURES

11.1 Instructions for preparation for emergency evacuation including crew co-ordination and emergency station assignment.

11.2 *Emergency evacuation procedures*. A description of the duties of all members of the crew for the rapid evacuation of a helicopter and the handling of the passengers in the event of a forced landing, ditching or other emergency.

12 HELICOPTER SYSTEMS

A description of the helicopter systems, related controls and indications and operating instructions.(See IEM to Appendix 1 to ANTR OPS 3.1045.)

C ROUTE AND HELIPORT OR LANDING LOCATION INSTRUCTIONS AND INFORMATION

1 Instructions and information relating to communications, navigation and heliport including minimum flight levels and altitudes for each route to be flown and operating minima for each heliport or landing location planned to be used, including:

(a) Minimum flight level/altitude;

(b) Operating minima for departure, destination and alternate aerodromes;

(c) Communication facilities and navigation aids;

(d) FATO/runway data and heliport or landing location facilities;

(e) Approach, missed approach and departure procedures including noise abatement procedures;

(f) COM-failure procedures;

(g) Search and rescue facilities in the area over which the helicopter is to be flown;

(h) A description of the aeronautical charts that must be carried on board in relation to the type of flight and the route to be flown, including the method to check their validity;

(i) Availability of aeronautical information and MET services;

(j) En-route COM/NAV procedures.

(k) Information related to the level of RFFS (Rescue and Fire Fighting Services) protection that is deemed acceptable to the operator shall be contained in the Operations Manual.

(l) Special heliport or landing location limitations (performance operating etc.).

D TRAINING

1 Training syllabi and checking programmes for all operations personnel assigned to operational duties in connection with the preparation and/or conduct of a flight.

2 Training syllabi and checking programmes must include:

2.1 *For flight crew*. All relevant items prescribed in OPS Part 3 Subparts E and N;

2.2 *For cabin crew*. All relevant items prescribed in Subpart O;

2.3 *For operations personnel concerned, including crew members:*

(a) All relevant items prescribed in OPS Part 3 Subpart R (Transport of Dangerous Goods by Air); and

(b) All relevant items prescribed in OPS Part 3, Subpart S (Security).

2.4 *For operations personnel other than crew members (e.g. despatcher, handling personnel etc.).* All other relevant items prescribed in OPS pertaining to their duties.

3 *Procedures*

3.1 Procedures for training and checking.

3.2 Procedures to be applied in the event that personnel do not achieve or maintain the required standards.

3.3 Procedures to ensure that abnormal or emergency situations requiring the application of part or all of abnormal or emergency procedures and simulation of IMC by artificial means, are not simulated during commercial air transportation flights.

4 Description of documentation to be stored and storage periods. (See Appendix 1 to ANTR-OPS 3.1065.)

Appendix 1 to ANTR OPS 3.1065

Document storage periods

The operator shall ensure that the following information/documentation is stored in an acceptable form, accessible to the BCAA, for the periods shown in the Tables below.

Note: Additional information relating to maintenance records is prescribed in ANTR M.A.306(c)-Operator's technical log system.

Table 1 – Information used for the preparation and execution of a flight

Information used for the preparation and execution of the flight as described in ANTR OPS 3.135	
Operational flight plan	3 months
Helicopter Technical log	24 months after the date of the last entry
Route specific NOTAM/AIS briefing documentation if edited by the operator	3 months
Mass and balance documentation	3 months
Notification of special loads including written information to the commander about dangerous goods	3 months

Table 2 – Reports

Journey log	3 months
Flight report(s) for recording details of any occurrence, as prescribed in ANTR OPS 3.420, or any event which the commander deems necessary to report/record	3 months
Reports on exceedances of duty and/or reducing rest periods	3 months
Fuel and oil records	3 months

Table 3 – Flight crew records

Flight Crew Records	
Flight, Duty and Rest time	15 months
Licence	As long as the flight crew member is exercising the privileges of the licence for the operator
Conversion training and checking	3 years
Command course (including checking)	3 years
Recurrent training and checking	3 years
Training and checking to operate in either pilot's seat	3 years
Recent experience (ANTR OPS 3.970 refers)	15 months
Route and aerodrome competence (ANTR OPS 3.975 refers)	3 years
Training and qualification for specific operations when required by ANTR-OPS (e.g. HEMS CATII/III operations)	3 years

Dangerous Goods training as appropriate	3 years

Table 4 – Cabin crew records

Cabin Crew Records	
Flight, Duty and Rest time	15 months
Initial training, conversion and differences training (including checking)	As long as the cabin crew member is employed by the operator
Recurrent training and refresher (including checking)	Until 12 months after the cabin crew member has left the employ of the operator
Dangerous Goods training as appropriate	3 years

Table 5 – Records for other operations personnel

Records for other operations personnel	
Training /qualification records of other personnel for whom an approved training programme is required by ANTR-OPS	Last 2 training records

Table 6 – Other records

Other records	
Quality System records	5 years
Dangerous Goods Transport Document	3 months after completion of the flight
Dangerous Goods Acceptance Checklist	3 months after completion of the flight

SUBPART Q – FATIGUE MANAGEMENT REQUIREMENTS

ANTR OPS 3.1100 Applicability

The BCAA has established the following prescriptive fatigue management regulations specifying the limitations applicable to the flight time and flight duty periods for crew members. These regulations also make provision for adequate rest periods to ensure that fatigue occurring either in a flight or successive flights, or accumulated over a period of time due to these and other tasks, does not endanger the safety of a flight.

This Subpart is applicable to Bahraini registered helicopters. In particular;

(a) Commercial Air Transport operations, or operations operated by an air transport undertaking.

(b) Private use operations of helicopters above 5700 kg maximum take-off mass.

ANTR OPS 3.1101 General Principles

The operator shall ensure that flight duty periods (FDPs) are planned in a way that enables crew members to remain sufficiently free from fatigue so that they can operate to a satisfactory level of safety in all normal and abnormal situations.

The operator shall take into account the relationship between the frequency and pattern of flight duty periods and rest periods and give consideration to the cumulative effects of undertaking long duty hours combined with minimum rest periods. Factors to be considered when planning duty periods include;

(a) The allocation of work patterns, which avoid such undesirable practices as;

   (1) alternating day/night duties,

   (2) the positioning of crews so that a serious disruption of established sleep/work patterns occur,

   (3) the scheduling of rest periods between 18 and 30 hours especially after long flights crossing multiple time zones.

(b) planning days off and notifying crews well in advance,

(c) consultation between operators and crews to agree basic roster concepts, which ensure adequate rest prior to flight.

(d) When developing a workable roster, the operator should strike a fair balance between the commercial needs and the capacity of individual crew members to work effectively. Rosters should be developed in such a way that they distribute the amount of work evenly among those that are involved.

ANTR OPS 3.1102 Responsibilities of operator and crew members

A crew member shall not fly, and the operator shall not require that crew member to fly, if either has reason to believe that he/she is suffering, or is likely to suffer while flying, from such fatigue as may endanger the safety of the helicopter or of its occupants. In addition:

(a) The Operator shall

   (1) prepare duty rosters sufficiently in advance to provide the opportunity for crews to plan adequate pre-duty rest.

(2) establish minimum periods of notification of duty for operating crews, or where this not practicable due to the nature of the operation, shall establish in advance minimum periods of notification of days off, during which a crew member will not be required for any duties.

(3) provide initial and recurrent fatigue management training to crew members, rostering staff and management personnel concerned.

This training shall follow a training programme established by the operator and described in the operations manual. The training syllabus shall cover the possible causes and effects of fatigue and fatigue countermeasure (see Appendix 1 to ANTR OPS 3.1102).

(4) provide for crew members both the opportunity and facilities for adequate pre-flight rest, in suitable accommodation when away from base.

(5) ensure that a crew member, if employed on an irregular basis, satisfies the provision of the approved scheme. Furthermore, the operator shall satisfy itself that crew members, who undertake other employment, if allowed by the operator, still have the opportunity to enjoy adequate pre-flight rest.

(6) provide rest periods of sufficient time to enable crew members to overcome the effects of the previous duties and to be rested by the start of the following flight duty period.

(7) plan schedules in order to be completed within the maximum permitted flying duty period taking into account the time necessary for pre-flight duties, the sector and turnaround times;

(b) Crew Member shall

Ensure that they are not in breach of the operator's scheme. They shall make optimum use of the opportunities and facilities for rest provided, and plan and use their rest periods properly. Crew members are reminded that they are not entitled to act as a member of the crew of an aircraft if they know or suspect that their physical or mental condition renders them temporarily unfit so to act.

ANTR OPS 3.1103 Standard provisions applicable to a scheme

(a) Subject to the maxima and minima specified in this subpart, it is incumbent on the operator to establish maximum FDPs and minimum rest periods appropriate to the nature of flight operations undertaken.

(b) The operator of a helicopter shall have a scheme for the regulation of flight and duty times of crews. The scheme shall be approved by the BCAA and be included in the Operations Manual. Comprehensive guidance and instructions shall be included in the Operations Manual for the benefit of all crew members and the staff concerned with the preparation and day to day management of rostering and scheduling. The scheme shall take into consideration rostering principles based on fatigue science and knowledge (see IEM to ANTR OPS 3.1101).

(c) Although operators must plan their schemes in accordance with the requirements, it is recognised that the standard provisions will not necessarily satisfy every type of operation. In these circumstances operators may apply for a change to the standard provisions.

(d) When applying for a variation to meet exceptional operational circumstances, operators shall provide a risk assessment (see Appendix1to ANTR OPS 3.1103) that is appropriate to the expected level of risk associated with the variation. BCAA approval for variations to prescribed limits will only be given where operators can show, on the basis of their risk assessment, that they can manage the variation to provide a level of safety equivalent to, or better than that achieved through complying with the prescriptive fatigue management regulations. Operators shall indicate how the fatigue risk associated with the variation will be managed under their SMS (see ANTR OPS 3.037).

Operators shall need to address some or all of the following areas:

(1) The nature and scope of the variation, including which of the prescriptive rules it affects, the operations to which it applies, and why it is needed.

(2) The operating environment in which the variation will apply (this may include people, procedures, equipment, stakeholders, the physical environment, the organizational culture, the legal and regulatory environment, natural hazards, and external threats).

(3) Potential impact of the variation on other services, for example ATC or airport services.

(4) A well-substantiated estimate of the impact of the variation on crew member fatigue, for example using published data from scientific studies or appropriate bio-mathematical models.

(5) Explanation of how the potential effects of the variation on fatigue will be monitored and documented.

(6) Description of the processes for risk assessment, if new fatigue hazards are identified as a result of the variation.

(7) Description of additional mitigations that can be put in place, if needed.

(e) The operator's application and the BCAA's approval for a variation to meet exceptional circumstances shall be documented.

(f) *Terminology* Terms used in this Subpart have the following meaning:

Acclimatised: When a crew member has spent 3 consecutive local nights on the ground within a local time zone band, which is two hours wide, and is able to take uninterrupted nights sleep The crew member will remain acclimatised thereafter until a duty period finishes at a place where local time differs by more than 2 hours from that at the point of departure.

Cabin Crew: An appropriately qualified crew member, other than a flight crew member, who is assigned by the operator to perform duty related to safety of flight and passengers during operations of a helicopter.

Commander: The pilot in command. The pilot designated by the operator being in command and charged with the safe conduct of a flight.

Contactable: A short period of time during the day, other than a day off, during which the operator requires a crew member to be at an agreed location for the purpose of giving notification of a duty period, which will commence not less than 10 hours ahead. The contactable period shall be nominated by the operator and acceptable to the CAA.

Crew member: A person assigned by the operator to duty on a helicopter during a flight duty period.

Days Off : Periods available for leisure and relaxation free from all duties. A single day off shall include two local nights. Consecutive days off shall include a further local night for each additional consecutive day off. A rest period may be included as part of a day off.

Dispatch crew: A fully qualified and current flight/cabin crew member authorized to carry out pre-flight duties as defined by the operator.

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

Duty Period: A period which starts when flight crew or cabin crew members are required by the operator to report for or to commence a duty and ends when that person is free from all duties, including post-flight duty.

Early Start: Any duty that is commenced in the period 0500-0659 local time.

Fatigue: A physiological state of reduced mental or physical performance capability resulting from sleep loss or extended wakefulness, circadian phase, or workload (mental and/or physical activity) that can impair a crew member's alertness and ability to safely operate an aircraft or perform safety-related duties

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

Fatigue Risk Management (FRMS) Policy: A required component of an FRMS. THE FRMS Policy must: identify the elements of the FRMS and its scope; reflect the shared responsibility of all stakeholders in the FRMS; state the safety objectives of the FRMS; be signed by the accountable executive of the organisation; be communicated throughout the organisation; declares management commitment to effective safety reporting, to providing adequate resourcing for the FRMS, and to continuous improvement of the FRMS; identify clear lines of accountability for the functioning of the FRMS; and require periodic reviews of the FRMS.

Flight Crew Member:	A licensed crew member charged with duties essential to the operation of an aircraft during a flight duty period such as Pilots and Flight Engineers.
Flight Duty Period (FDP):	A period that commences when a crew member is required to report for duty that includes a flight or a series of flights and which finishes when the helicopter finally comes to rest and the engines are shut down at the end of the last flight on which he/she is a crew member.
Flight Time – Helicopter:	The total time from the moment a helicopter's rotor blades starts turning until the moment the helicopter finally comes to rest at the end of the flight, and the rotor blades are stopped.
Late finish	Any duty that finishes in the period 0100 to 0159 hours local time.
Local Night:	A period of 8 hours falling between 2200 hours and 0800 hours local time.
Night Duty:	A duty is a Night Duty if any part of that duty falls within the period 0200 to 0459 hours local time.
Positioning:	The practice of transferring crews from place to place as passengers in surface or air transport at the behest of the Operator.
Reporting Time:	The time at which a crew member is required by the operator to report for any duty.
Rest Period:	A continuous and defined subsequent to and/or prior to duty, during which flight or cabin crew members are free of all duties.
Rostered/Planned duty:	A duty period, or series of duty periods, with stipulated start and finish times, notified by the operator to crews in advance.
Rostering Period:	A number of consecutive weeks, usually 4, but defined by the operator.
Scheduled Duty:	The allocation of a specific flight or flights or other duties to a crew member within the pre-notified rostered/planned series of duty periods.
Sector:	The time between an aircraft first moving under its own power until it next comes to rest after landing, on the designated parking position. Segment of a Flight Duty Period (FDP) between an aircraft first moving for the purpose of taking off until it comes to rest after landing on the designated parking position.

Split Duty:	A flying duty period, which consists of two or more sectors, separated by less than a minimum rest period.
Standby Duty:	A period during which the operator places restraints on a crew member who would otherwise be off duty. However, it shall not include any time during which the operator requires a crew member to be contactable for the purpose of giving notification of a duty, which is due to start 10 hours or more ahead.
Suitable Accommodation:	A well furnished bedroom, which is subject to minimum noise, is well ventilated, and has the facility to control the levels of light and temperature.
Travelling:	All time spent by a crew member transiting between the place of rest, and the place of reporting for duty.
Unforeseen operational circumstance:	An unplanned event, such as unforecast weather, equipment malfunction, or air traffic delay that is beyond the control of the operator.
Week:	A period of seven consecutive days starting at any set time and on set day as specified and stated by the Operator.
Window of Circadian Low (WOCL):	'Window of Circadian Low ('WOCL') means the period between 02:00 and 05:59 hours in the time zone to which a crew member is acclimatised.

ANTR OPS 3.1105 Calculation of a flying duty period (FDP)

The maximum rostered FDP, in hours and fractions of hours, shall be in accordance with the following Table at ANTR OPS 3.1110. The times extracted from the tables may be extended by use of in-flight relief, split duty and Commander's discretion.

ANTR OPS 3.1106 Additional limits

(a) *Late finishes/Early starts/Night Duties*

(1) Sleep deprivation, leading to the onset of fatigue, can arise if an operating crew member is required to report early for duty on a number of consecutive days. Therefore, not more than 3 consecutive duties that occur in any part of the period 0100 to 0659 hours local time can be undertaken, nor will there be more than 4 such duties in any seven (7) consecutive days.

Any run of consecutive duties (Late Finishes or Nights or Early Starts) can only be broken by a period of not less than 34 consecutive hours free from such duties. These 34 consecutive hours may include a duty that is not an Early, Late or Night duty.

(2) Operating crew members, who are employed on a regular early morning duty for a maximum of 5 consecutive duties, shall work to the following;

(i) The minimum rest period before the start of such a series of duties is 24 hours.

(ii) The duty will not exceed 9 hours, irrespective of the sectors flown.

(iii) At the finish of such a series of duties, crew members will have a minimum of 63 hours free from all duties.

(3) Should a crew member be scheduled for duty that occurs during any part of the period 0200 to 0459 hours local time, for a minimum of 2 and a maximum of 3 consecutive nights, then crew members shall be planned to be free from all duties by 2100 hours local time before covering the block of consecutive night duties, such that the crew members can take a rest period during a local night.

Note: Operators may replace the above paragraph with one of the following choices, either Options A and B or Options B and C. The operator may roster operating crew members foreither 2 or 3 consecutive nights, but must ensure that the duty preceding this series of dutiesfinishes by 2359 hours local time (2 nights) or 2100 hours local time (3 nights) as appropriate. If it is preferred to retain the present contents then attention must be paid to the notes attached to the Options listed (below). These notes list the actions to be followed in the event that duty is inadvertently extended beyond the cut off times (i.e. 2100 or 2359 hours).

Option A

Should any duties be scheduled to be carried out within any part of the period 0200 and 0459 hours local time, for 3 consecutive nights, then operating crew members will finish the duty preceding this series of duties by 2100 hours local time before commencing the block of consecutive night duties, such that the operating crew members can take a rest period during a local night. If the duty immediately prior to the 3 consecutive night duties extends beyond 2100 hours local time and the individual operating crew member is willing to continue with the planned roster, (i.e. 3 consecutive night duties) then provided that duty preceding this series of duties finishes no later than 2359 hours local time, the schedule may continue.

Note1: Under this Option, if the operating crew member chooses not to continue the planned roster (after finishing duty between 2100 and 2359 hours local time) then only the planned first and second night duties that impinge on any part of the period 0200 to 0459 hours local time may be undertaken.

Note 2: Under this Option, if the duty finishes after 2359 hours local time, then only the first of the 3 consecutive night duties that impinge on any part of the period 0200 to 0459 hours local time may be undertaken.

Option B 2 consecutive night duties

Should any duties be scheduled to be carried out within any part of the period 0200 and 0459 hours local time, for 2 consecutive nights, then operating crew members will finish the duty preceding this series of duties by 2359 hours local time before commencing the block of 2 consecutive night duties, such that the crew members can take a rest period during a local night.

Note: Under this Option in the event of 2359 hours being exceeded, then only the first of the 2 planned consecutive night duties that impinge on any part of the period 0200 to 0459 hours local time may be undertaken.

Option C 3 consecutive night duties

Should any duties be scheduled to be carried out within any part of the period 0200 and 0459 hours local time, for 3 consecutive nights, then operating crew members will finish the duty preceding this series of duties by 2100 hours local time before commencing the block of consecutive night duties, such that the operating crew members can take a rest period during a local night.

Note 1: Under this Option in the event of 2100 hours being exceeded, then only the first of the 3 planned consecutive night duties that impinge on any part of the period 0200 to 0459 hours local time may be undertaken.

Note 2: In all cases the limits in paragraph (a) (1) and (2) must not be exceeded (i.e. maximum of 3 consecutive nights and 4 in 7 consecutive days).

(4) However, operating crew members, who are employed on a regular night duty for a maximum of 5 consecutive nights, shall work to the following;

(i) The minimum rest period before the start of such a series of duties is 24 hours.

(ii) The duty will not exceed 8 hours, irrespective of the sectors flown.

(iii) At the finish of such a series of duties, crew members will have a minimum of 54 hours free of all duties.

(5) Options for night operations

If the operator elects to roster 4 or 5 consecutive night duties, then the criteria laid down in Option C (4) above must be complied with and must form part of the approved FDP scheme. Operators are reminded that the normal days off requirements must be met (i.e. the 54 hours off between two blocks of 5 nights is only 1 proper day off). However, if operators find that this part of the Scheme is too restrictive then one of the following options may be employed but, if used, must be fully complied with:

(i) When crew are employed on duty for a total of 20 hours or less during 5 consecutive night duties, (i.e. maximum duty each night is 4 hours) the 54 hours free from all duties will meet the "Days Off" requirements for each 28 consecutive day period. Any positioning flights must be completed within the 20 hours duty.

(ii) When crew are employed on duty for a total of more than 20 hours but not more than 40 hours during 5 consecutive night duties, the first 54 hours (between week 1 and week 2) may be counted as 2 "Days Off". For the 28 consecutive day period that starts on the first night of the first duty, crew must be given a minimum of a further 5 "Days Off" (average of a further 6 days). Any positioning flights must be completed within the 40 hours duty.

(iii) When crew are employed on duty which requires full use of 40 hours duty during 5 consecutive night duties plus a maximum of 3 hours positioning (pre and post total) then:

(a) allowable flying hours (month and year) will be reduced to the following:

(1) a maximum of 75 hours in any 28 consecutive days with a maximum of 60 hours in 28 consecutive days averaged over three 28 day periods, and;

(2) 600 hours in any 12 consecutive months.

(b) a minimum of 9 "Days Off" in any 28 consecutive days will be granted;

(c) any increase in duty over 40 hours during the block of 5 consecutive night duties is to be added to the subsequent 54 hours rest period which may not be reduced.

(6) General rules

To be applied when the operator utilises (i), (ii) or (iii) of paragraph (5).

(i) The exercise of "Commander's Discretion" is limited to 1 hour per night with a total of 2 hours allowed during any 5 consecutive night cycle. Any duty worked in excess of 40 hours by use of "Commander's Discretion" must also be added to the subsequent 54 hours rest which may not be reduced.

(ii) The absolute maximum duty permitted during a block of 5 consecutive night duties is 45 hours [40 hours, plus 3 hours positioning, plus 2 hours “Commander's Discretion", as per paragraphs (5) (iii) and (6)(i) above.

(iii) Crew cannot be rostered for more than 8 hours per night, except when working to paragraph 2.1.1 iii) above.

(iv) Combination of split duties and extension of FDP by in flight rest are not permitted.

(v) "Commander's Discretion" to reduce rest is not permitted.

Note: For 5 consecutive earlies, the same rule as in (6)(i) above applies (i.e. maximum 1 hour discretion per day and a total of 2 hours in the 5 day cycle).

(b) Mixed duties

(1) General

When a crew member is required to report for duty in advance of the stipulated report time for a scheduled flight, to carry out a task at the behest of an employer, then the time spent on that task shall be part of the subsequent FDP.

(2) Fixed and Rotary Wing Flying

When both fixed wing and rotary wing flying is carried out the more restrictive flight and duty times shall apply.

(3) Mixed Simulator and Aircraft Flying

When a flight crew member flies in a simulator, either on a check or training flight, or as a Training Captain or Instructor, and then within the same duty period flies as a crew member, all the time spent in the simulator is counted in full towards the subsequent FDP, and for helicopters towards the daily hour maxima. Simulator flying does not countas a sector, but the FDP allowable is calculated from the report time of the simulator detail.

(4) Mixed Single Pilot/Two Pilot Operations

In one duty period a pilot may fly as a single flight crew member up to the point where the total flying and duty hours reach the single flight crew FDP limit. During this time the pilot may fly either in command or as a co-pilot on a two flight crew aircraft. The pilot may then continue beyond the single flight crew FDP limit in a two flight crew operation up to the 2 flight crew FDP and flying hour maxima, but may only fly as a co-pilot.

(c) Travelling time

(1) Travelling time, other than that spent on positioning, shall not be counted as duty.

(2) When a crew member is required to travel from their residence to an aerodrome other than the one from which they normally operate, any travelling time over and above the journey time from that residence to the usual operating aerodrome shall be classed as positioning. Notional times for any additional travelling shall be agreed between the operator and the BCAA.

(3) Where travelling time between the airport and sleeping accommodation provided by the operator exceeds 30 minutes each way, the rest period provided shall be increased by the amount of the excess.

(d) Delayed reporting time in a single FDP

(1) When a crew member is informed of a delay to reporting time due to a changed schedule, before leaving the place of rest, the FDP shall be calculated as follows;

(i) When the delay is less than 4 hours, the maximum FDP shall be based on the original report time and the FDP shall start at the actual report time.

(ii) When the delay is 4 hours or more, the maximum FDP shall be based on the more limiting time band of the planned and the actual report time and the FDP starts 4 hours after the original report time.

(2) When the operator informs a crew member before leaving the place of rest of a delay in reporting time of 10 hours or more ahead, and that crew member is not further disturbed by the operator until a mutually agreed hour, then that elapsed time is classed as a rest period. If, upon the resumption of duty, further delays occur then the appropriate criteria in this paragraph and paragraph (a)(1) above shall be applied to the re-arranged reporting time.

(e) Positioning

(1) All time spent on positioning at the behest of the operator shall count as duty, but positioning does not count as a sector when calculating the FDP. In these circumstances the FDP commences not later than the time at which the crew member reports for the positioning journey, or positions in accordance with paragraph 9.2.

(2) If, after a positioning journey, the operating crew member spends less than a minimum rest period at suitable accommodation provided by the operator, and then carries out an FDP, the positioning shall be counted as a sector if a split duty is claimed when calculating the allowable FDP. If it is not, then a split duty FDP cannot be used.

(f) Standby duty

(1) The time of start, end and nature of the standby duty shall be defined and notified to crew members. The time a standby duty starts determines the allowable FDP, except that when the actual FDP starts in a more limiting time band then that FDP limit will apply. However when standby duty taken at home, or in suitable accommodation provided by the

Operator, during the period 2200 to 0800 hours local time and a crew member is given 2 hours or less notice of a report time, the allowable FDP starts at the report time for the designated reporting place.

(2) When a crew member is on standby duty on immediate readiness at an aerodrome, then the allowable FDP is calculated using the start time of the standby duty.

(3) If a crew member is called out from standby, the standby duty will cease when that individual reports at the designated reporting place.

(4) The length of the minimum rest period after standby duty shall be based on the combined length of standby duty plus FDP or positioning (if any).

(5) The following limits shall apply:

Duty	**Maximum Duration**
Standby Duty(all cases)	12 Hours
Standby followed by an FDP	As in Case A and B below

Case A

If a crew member is called out from standby to conduct an FDP before completing 6 hours standby duty then the total duty period allowed is the sum of the time spent on standby and the FDP allowable from Tables A, B or C.

Case B

If a crew member is called out from standby to conduct an FDP after completing 6 or more hours standby duty, then the total duty period allowed is the sum of all the time spent on standby and the allowable FDP, reduced by the amount of standby worked in excess of 6 hours.

Note 1: The method of adding time spent on standby to cumulative totals is stated in ANTR OPS 1.1136.

Note 2: The reference to 'total duty period' applies only to the sum of the standby time achieved + the allowable FDP obtained from ANTR OPS 1.1110. On the day, for cumulative duty totals and for minimum rest purposes, the total duty achieved will be standby time achieved + FDP achieved + post flight duties + any positioning.

(6) When any period of standby finishes, during which a call-out has not occurred, at least 12 hours rest must follow prior to the next duty period. Similarly, following the end of a contactable period or periods, at least 10 hours must elapse prior to the next duty period.

(g) Demanding roles.

When carrying out more demanding roles of helicopter flying, such as winching, external load or short sector operations, the operator shall specify maximum periods of continuous operation. The limits set shall include a break of at least 30 minutes away from the helicopter within any continuous period of 3 hours, but depending on the nature and circumstances of a particular operation, may need to be more restrictive.

ANTR OPS 3.1110 Maximum FDP

Standard reporting times prior to flight shall be specified by the operator. The stipulated time is the minimum report time and cannot be reduced in order for crew members to achieve their required rest prior to an FDP. Pre-flight duties are part of the FDP. A minimum period of duty of at least 30 minutes shall be allowed for pre-flight and another 15 minutes for post flight activities.

Local time of Start	SINGLE PILOT		TWO PILOTS	
	Maximum Length of FDP (hours)	Maximum Flying Time (hours)	Maximum Length of FDP (hours)	Maximum Flying Time (hours)
0600-0659	9	6	10	7
0700-0759	10	7	11	8
0800-1359	10	7	12	8
1400-2159	9	6	10	7
2200-0559	8	5	9	6

ANTR OPS 3.1117 Extension of FDP by split duty

(a) When an FDP consists of two or more sectors/duties, of which one can be a positioning journey counted as a sector, but separated by less than a minimum rest period, then the FDP may be extended beyond that permitted by the amounts indicated below:

Consecutive Hours Rest	Maximum Extension of FDP
Less than 3 hours	Nil
3 to 10 hours	A period equal to half of the consecutive hours rest taken

(b) The rest period shall not include the time allowed for immediate post flight and pre-flight duties. The actual time allowed for immediate post flight duties and preflight duties shall be specified by the operator in its Operation Manual (OMA). When the rest period is less than 6 hours, it will be suffice if a quiet and comfortable place, not open to the public, is available. If the rest period is more than 6 consecutive hours, then suitable accommodation shall be provided.

(c) When rest is taken in the aircraft on the ground, the minimum standards of noise, temperature, light and ventilation are to be specified in the Operations Manual. Such arrangements will only be permitted when the crews have adequate control of temperature and ventilation within the aircraft, and passengers are not on board.

ANTR OPS 3.1120 Rest periods

(a) The aircraft operator must notify all crew members in good time of a flying duty period so that sufficient and uninterrupted pre-flight rest can be obtained. When away from base, the operator shall provide the crew with the opportunity and the facilities for adequate pre-flight rest. The operator shall provide suitable accommodation. When flights are carried out at such short notice that it is impracticable for the operator to arrange suitable accommodation, then this responsibility devolves to the aircraft pilot in command.

(b) The minimum rest period, which shall be provided before undertaking a flying duty period shall be:

(1) At least as long as the preceding duty period, or

(2) 12 hours,

whichever is the greater.

(c) In the case when the rest period earned by a crew member is 12 hours, and suitable accommodation is provided by the operator, then that rest period may be reduced by one hour. In such circumstances, if the travelling time between the aerodrome and the accommodation is more than 30 minutes each way then the rest period shall be increased by the amount the total time spent travelling exceeds one hour. The room allocated to the crew member must be available for occupation for a minimum of 10 hours. This paragraph does not apply to rest periods that exceed 12 hours.

(d) Exceptionally at home base, individual crew members may be asked to exercise their discretion to reduce rest by up to a maximum of one hour but only to a minimum of 12 hours for flight crew and 11 hours for cabin crew. If discretion is used, it is the responsibility of the operator and the crew member to inform the commander of the flight immediately following the rest period, that a reduced rest period has been taken.

(e) If the preceding duty period, which includes any time spent on positioning, exceeded 18 hours, then the ensuing rest period shall include a local night.

(f) The rest period following a sequence of reduced rest and then an extended FDP, cannot be reduced.

(g) After being called out from a standby duty, the length of minimum rest shall be determined by the length of standby duty, plus any time spent on positioning, and any FDP completed.

(h) Crew members who inform the operator that they having difficulty in achieving adequate pre-flight rest must be given the opportunity to consult an aviation medical specialist.

ANTR OPS 3.1125 Commander's discretion to extend a FDP

(a) An aircraft Commander may, at his discretion, and in the case of unforeseen circumstances in flight operations, extend a FDP beyond that permitted in Table at ANTR OPS 3.1110, provided he is satisfied that the flight can be made safely. The extension shall be calculated according to what actually happens, not on what was planned to happen. An extension of 3 hours is the absolute maximum permitted, except in cases of emergency. (See ANTR OPS 3.1127)

(b) The commander shall consult all crew members on their alertness levels before deciding the modifications under ANTR OPS 1.1125 and 1.1128.

(c) Commander's discretion to extend a FDP may only be exercised once the FDP has commenced. The operator shall not plan a FDP on the basis of the use of Commander's discretion.

(d) The operator's scheme shall include guidance in the Operations Manual to aircraft commanders on the limits within which discretion may be extended, and shall include specific limits to which a commander may extend the FDP.

In a Flight Duty Period involving 2 or more sectors up to a maximum of 2 hours discretion may be exercised prior to the first and subsequent sectors. On a single sector flight and immediately prior to the last sector on a multi sector flight, a commander may utilise the full amount of discretion authorised by the operator.

(e) A commander shall not exercise discretion to extend a FDP following a reduced rest.

(f) The operator shall implement a non-punitive process for the use of the discretion described under this regulation and shall describe it in the Operations Manual.

ANTR OPS 3.1126 Reporting of commander's discretion

(a) Whenever a Commander extends a FDP, it shall be reported to his employer on a Discretion Report form acceptable to the BCAA. If the extension is greater than 2 hours, then the operator shall submit the Commander's written report, together with the operator's comments to the BCAA within 14 days of the aircraft's return to base.

(b) The operator shall keep records of occasions when a Commander has exercised his or her discretion. If discretion has to be applied for similar reasons on more than 10 per cent of occasions when a particular route or route pattern is flown during a calendar year (01 January to 31 December), the operator shall notify the BCAA in writing and make arrangements to change the schedule or the crewing arrangements so as to reduce the frequency at which such events occur.

(c) Discretion reports will be used by the BCAA to assess the realism of particular schedules.

ANTR OPS 3.1127 Extension of discretion in emergency

An emergency requiring an extension to the FDP is a situation, which in the judgement of the Commander, presents a serious risk to the health or safety of crew and passengers, or endangers the lives of others. In this proviso can also be included, search and rescue and provision of relief in case of distress.

ANTR OPS 3.1128 Commander's discretion to reduce a rest period

(a) An aircraft Commander may, at his discretion, and after consulting with other members of the crew, reduce a rest period but only insofar as the room allocated to the crew member, must be available for occupation for a minimum of 10 hours. The exercise of such discretion shall be considered exceptional and shall not be used to reduce successive rest periods.

(b) Whenever a Captain so exercises his discretion and reduces a rest period, it shall be reported to his employer on a Discretion Report form acceptable to the BCAA. If the reduction is more than 1 hour, then the operator shall submit the Commander's written report, together with the operator's comments to the BCAA within 14 days of the aircraft's return to base.

(c) The operator shall implement a non-punitive process for the use of the discretion described under this regulation and shall describe it in the Operations Manual.

ANTR OPS 3.1130 Days off

(a) Wherever possible and if required by the crew member, days off should be taken in the home environment.

(b) A single day off shall include two local nights, and shall be of least 34 hours duration.

(c) A planned rest period may be included as part of a day off.

(d) Crew members shall;

(1) not be on duty more than 7 consecutive days between days off, but may be positioned to the usual operating base on the eighth day, provided they are then allocated at least 2 consecutive days off, and

(2) have 2 consecutive days off in any consecutive 14 days following the previous 2 consecutive days off, and

(3) have a minimum of 7 days off in any consecutive 28 days, and

(4) have an average of at least 8 days off in each consecutive 28 day period, averaged over three (3) such periods.

ANTR OPS 3.1135 Absolute limits on flying hours

The maximum flying hours, which a helicopter pilot shall be permitted to undertake are;

(a)	Single day	–	as prescribed in Table at ANTR OPS 3.1110
(b)	Any 3 consecutive days	–	18 hours
(c)	Any 7 consecutive days	–	30 hours
(d)	Any 3 consecutive 28 day periods	–	240 hours
(e)	Any 28 consecutive days	–	90 hours
(f)	Any period of 12 months	–	800 hours

ANTR OPS 3.1136 Cumulative Duty Hours

The maximum duty hours for flight crew of a helicopter shall not exceed;

(a) 60 hours in any 7 consecutive days, and

(b) 200 hours in any 28 consecutive days.

Note: Flying hours include all flying as crew except private flying in aircraft not exceeding 1600 kg maximum take-off mass.

ANTR OPS 3.1137 Calculation of Cumulative Duty Hours

Duty hours shall be added to cumulative totals in accordance with the following:

(a) To count in full;

(1) Duty periods and FDPs, plus subsequent post-flight duties.

(2) All standby duty, except that specified in (b) (1) and (2) below.

(3) The time spent on positioning.

(b) To count as half the time on duty;

(1) The standby duty, when the period of notice given to the crew member by the operator before reporting for duty, is treble or more the specified minimum report time.

(2) The standby duty, when taken at home, or in suitable accommodation provided by the operator, takes place during the period 2200 to 0800 hours, and the crew member can take undisturbed rest and is not called out for duty.

Note: A single day off can only be allocated when 6 or less consecutive days duty have been worked.

ANTR OPS 3.1140 Cabin crew requirements

The limitations, which shall be applied to cabin crew are those applicable to flight crew members, but with the following differences:

(a) A FDP can be 1 hour longer than that permitted for flight crew. The FDP and limits set on early starts for cabin crew shall be based on the time at which the flight crew report for their FDP.

(b) Minimum rest periods can be 1 hour shorter than those required by the flight crew.

(c) The combined sum of standby time and subsequent FDP can be 1 hour longer than that permitted to flight crew.

(d) The maximum duty hours for cabin crew shall not exceed;

(1) 60 hours in any consecutive 7 days, but may be increased to 65 hours, when a rostered duty covering a series of duty periods, once commenced, is subject to unforeseen delays,

(2) 105 hours in any 14 consecutive days, and

(3) 210 hours in any 28 consecutive days.

(e) The annual and 28 day limits on flying hours appertaining to flight crew need not be applied.

(f) The limits relating to two pilot flight crew long range operations do not apply.

ANTR OPS 3.1145 Records to be maintained

(a) Records for the flight, duty and rest periods of all staff shall be kept for a period of at least 24 months from the date of the last relevant entry. These records shall include for each flight and cabin crew member:

(1) The start, duration and end of each Duty Period and Flight Duty Period (FDP), and functions performed during that period.

(2) Duration of each rest period prior to a FDP or standby duty period;

(3) Dates of days off;

(4) 7 consecutive day totals of duty

(5) Flight time

(b) Flight crew members shall maintain a personal record of their daily flight time.

(c) Additionally, operators shall retain all aircraft commander's discretion reports of extended FDPs, extended flying hours, and reduced rest periods for a period of at least 6 months after the event. (See ANTR OPS 3.1126)

Appendix 1 to ANTR OPS 3.1102

Fatigue Management Training

Training Syllabus Fatigue Management Training

The training syllabus should contain the following:

(a) applicable regulatory requirements for flight, duty and rest;

(b) the basics of fatigue including sleep fundamentals and the effects of disturbing the circadian rhythms;

(c) the causes of fatigue, including medical conditions that may lead to fatigue;

(d) the effect of fatigue on performance;

(e) fatigue countermeasures;

(f) the influence of lifestyle, including nutrition, exercise, and family life, on fatigue;

(g) familiarity with sleep disorders and their possible treatments;

(h) where applicable, the effects of long range operations and heavy short range schedules on individuals;

(i) the effect of operating through and within multiple time zones; and

(j) the crew member responsibility for ensuring adequate rest and fitness for flight duty.

Appendix 1 to ANTR OPS 3.1103

Risk Assessment for Variations to Prescriptive Regulations

Before processing the operator's application for a variation to the FDP requirements, the BCAA shall evaluate the operator's capability and willingness to manage safety, based on previous oversight experience.

The effort expected of the operator in developing a risk assessment shall reflect the safety risk it aims to address. Risk assessments to support minor and temporary variations to prescribed limits should be proportionate to the risk. In some cases the capability of the operator making the change and the low safety impact of the change may mean that the information provided in the risk assessment is quite brief.

While not all risk assessments require the same level of preparation, the BCAA shall evaluate them using the following interrelated steps:

(a) Assessing the nature, scope and impact of the proposed variation;

(b) Assessing the applied risk assessment methodology;

(c) Evaluating how the risk assessment is used and how the decision to accept risk has been made;

(d) Assessing the appropriateness of the risk mitigation measures;

(e) Assessing whether the claims, arguments and evidence made in the risk assessment are valid;

(f) Assessing plans for continued monitoring of the safety impact of the changes.

The steps for evaluating risk assessments are discussed below in relation to the operator's application for variations to prescribed limits.

(a) Assessing the Nature, Scope and Impact of the Proposed Variations

Objective	The operator shall assure the BCAA that it understands the change it is proposing including the direct or indirect impact of the change on the fatigue levels of those who will work to the new limits.
Methods	• The operator shall submit documentation that clearly identifies which element(s) of the prescriptive regulations it is seeking to vary, the proposed changes, and the operations to which they are intended to apply. • Other areas of regulation that are affected by the proposal are identified. • The operator shall submit documentation that demonstrates that it has considered any direct or indirect impacts the proposed variations will have on those operations and other services.

(b) Assessing Hazard and Consequence Identification

Objective	The operator shall assure the BCAA that a hazard identification process has been carried out with regard to the proposed variation and that the consequences of the hazards have been documented.

Methods	• The BCAA shall review the method used by the operator to identify and assess the fatigue hazards and their consequences for the proposed variation. • The BCAA shall review any other direct or indirect hazards identified by the operator in relation to the variation and their consequences. • The BCAA shall consider transitional risks to the operation associated with the variation.

(c) Evaluating the Way the Risk has been Assessed and Accepted

Objective	The operator shall assure the BCAA that the level of risk associated with the proposed variation is acceptable.
Methods	• The BCAA shall examine the operator's record of the risk assessment. • The BCAA shall assess if the risk assessment appears reasonable both before and after mitigations have been applied using personal experience and judgment. • The operator shall provide evidence that existing fatigue controls and mitigations are effective. • The operator shall confirm that an appropriately authorized person has accepted the remaining risk level and that this has been recorded.

(d) Assessing the Risk Mitigation Measures

Objective	The operator shall assure the BCAA that the mitigations identified by the operator are sufficient to manage the fatigue risk expected when operating up to the fullest extent of the variation to the fatigue management limitations being proposed.
Methods	• The BCAA shall determine who was involved in the process of identifying and establishing the mitigations to ensure that this was conducted at the correct level within the organizational structure of the operator and with the involvement of the relevant people. • The BCAA shall carefully examine the proposed fatigue mitigations using knowledge of the operator proposing the variations and of other operators in similar situations to establish if the mitigations are appropriate and likely to be effective. • The BCAA shall review the operator's processes and procedures to evaluate the appropriateness of their plan for risk management, and training. • The BCAA shall consider other aspects of human performance that may be affected by the mitigations. • The BCAA shall ensure that the operator is not relying only on training to mitigate fatigue risks.

(e) Assessing that the Claims, Arguments and Evidence made in the Risk Assessment are Valid

Objective	The operator shall assure the BCAA the claims and arguments are robust and supporting evidence is accurate and correctly interpreted.
Methods	• The BCAA shall review the operator's safety arguments to confirm that a justification for the continuation of an acceptable level of safety performance has been demonstrated. In addition, the BCAA shall verify that: • The operator's safety arguments are supported by well-validated research or best practices. • Transitional risks are mitigated. • Clear conclusions are included in the risk assessment • The operator's proposed mitigations have considered all the legal requirements applicable to the worker (national, international, safety, social) and that they have been captured and addressed.

(f) Assessing Plans for Continued Monitoring of the Safety Impact of the Variations

Objective	The operator shall assure the BCAA that the hazards associated with the variations have been correctly identified and the mitigations are performing as expected.
Methods	• The BCAA shall verify that the operator has processes in place and demonstrated the capability to allow continued monitoring through existing SMS activities. • The BCAA shall verify that specific safety performance indicators related to the variation are established by the operator. The BCAA shall verify that the operator has in place a review process to assess the impact of organizational changes/operator changes to the operating environment.

The BCAA shall record all elements of this risk assessment. This shall include what evidence (documentation) was reviewed, any safety concerns that were not acceptably addressed and the rationale for the decision to accept or reject the variation, as well as the period of time that the variation remains applicable. This process should also include scheduling a review of the variation once it is operational within the BCAA's oversight programme.

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SUBPART R – TRANSPORT OF DANGEROUS GOODS BY AIR

ANTR OPS 3.1150 General

The operator shall comply with the applicable provisions contained in this Subpart and the Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO DOC 9284), irrespective of whether:

(a) the flight is wholly or partly within or wholly outside the territory of the Kingdom of Bahrain; or

(b) an approval to carry dangerous goods in accordance with ANTR OPS ~~1~~ 3.1155 is held.

Note 1: Annex 18 — The Safe Transport of Dangerous Goods by Air include broad provisions for the international transport of dangerous goods by air which are amplified in the Technical Instructions for the Safe Transport of Dangerous Goods by Air ICAO DOC 9284, Technical Instructions). Annex 18, Chapter 2 includes provisions making dangerous goods under certain conditions not subject to Annex 18. These are amplified in Parts 1;1 and 1;2 of the Technical Instructions.

Note 2: Due to the differences in the type of operations carried out by helicopters, compared to those of aeroplanes, some additional considerations need to be made when dangerous goods are carried by helicopter, as described in the Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO DOC 9284, Technical Instructions), Part 7;7.

Note 3: Operator responsibilities and requirements for the transport of dangerous goods and for incident and accident reporting are contained in this Subpart and Part 7 of the Technical Instructions).

Note 4: The requirements pertaining to crew members or passengers carrying dangerous goods on aircraft are also set forth in this Subpart and Part 8, Chapter 1, of the Technical Instructions.

Note 5: COMAT that meets the classification criteria of the Technical Instructions for dangerous goods are considered cargo and shall be transported in accordance with this Subpart and Part 1.2.2.2 or Part 1.2.2.3 of the Technical Instructions (e.g. aircraft parts such as chemical oxygen generators, fuel control units, fire extinguishers, oils, lubricants, cleaning products).

Note 6: Exceptions. The general exceptions contained in Part 1;1.1.5 of the Technical Instructions and the exceptions contained in Part 1;2.2 of the Technical Instructions also apply to any general aviation helicopter.

ANTR OPS 3.1152 Terminology

(a) Terms used in this Subpart have the following meanings:

(1) *Acceptance Check List*. A document used to assist in carrying out a check on the external appearance of packages of dangerous goods and their associated documents to determine that all appropriate requirements have been met.

(2) *Approval*. For the purposes only of compliance with ANTR OPS 3.1165(b)(2), an authorisation referred to in the Technical Instructions and issued by an authority, for the transport of dangerous goods which are normally forbidden for transport or for other reasons, as specified in the Technical Instructions;

(3) *Cargo*. Any property carried on an aircraft other than mail and accompanied or mishandled baggage.

Note 1: COMAT that meets the classification criteria of dangerous goods, and which is transported in accordance with Part 1;2.2.2, Part 1;2.2.3 or Part 1;2.2.4 of the Technical Instructions, are considered as "cargo" (e.g., aircraft parts such as chemical oxygen generators, fuel control units, fire extinguishers, oils, lubricants and cleaning products).

(4) *Cargo Aircraft*. Any aircraft which is carrying goods or property but not passengers. In this context the following are not considered to be passengers:

(i) A crew member;

(ii) The operator's employee permitted by, and carried in accordance with, the instructions contained in the Operations Manual;

(iii) An authorised representative of an Authority; or

(iv) A person with duties in respect of a particular shipment on board.

(5) *Dangerous Goods*. Articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the Technical Instructions or which are classified according to those Instructions.

(6) *Dangerous Goods Accident*. An occurrence associated with and related to the transport of dangerous goods which results in fatal or serious injury to a person or major property damage. (See IEM OPS 3.1150(a)(3) & (a)(4)).

(7) *Dangerous Goods Incident*. An occurrence, other than a dangerous goods accident, associated with and related to the transport of dangerous goods, not necessarily occurring on board an aircraft, which results in injury to a person, property damage,fire, breakage, spillage, leakage of fluid or radiation or other evidence that the integrity of the packaging has not been maintained. Any occurrence relating to the transport of dangerous goods which seriously jeopardises the aircraft or its occupants is also deemed to constitute a dangerous goods incident. (See IEM OPS 3.1150(a)(3)& (a)(4))

(8) *Dangerous Goods Transport Document*. A document which is specified by the Technical Instructions. It is completed by the person who offers dangerous goods for air transport and contains information about those dangerous goods. The document bears a signed declaration indicating that the dangerous goods are fully and accurately described by their proper shipping names and UN/ID numbers and that they are correctly classified, packed, marked, labelled and in a proper condition for transport.

(9) *Exemption.* For the purposes only of compliance with this Subpart, an authorisation referred to in the Technical Instructions and issued by all the authorities concerned, providing relief from the requirements of the Technical Instructions.

(10) *Freight Container*. A freight container is an article of transport equipment for radioactive materials, designed to facilitate the transport of such materials, either packaged or unpackaged, by one or more modes of transport.

Note: See Unit Load Device where the dangerous goods are not radioactive materials.

(11) *Handling Agent*. An agency which performs on behalf of the operator some or all of the latter's functions including receiving, loading, unloading, transferring or other processing of passengers or cargo.

(12) *ID number.* A temporary identification number for an item of dangerous goods which has not been assigned a UN number.

(13) *Overpack.* An enclosure used by a single shipper to contain one or more packages and to form one handling unit for convenience of handling and stowage.
Note: A unit load device is not included in this definition.

(14) *Package*. The complete product of the packing operation consisting of the packaging and its contents prepared for transport.

(15) *Packaging*. Receptacles and any other components or materials necessary for the receptacle to perform its containment function and to ensure compliance with thepacking requirements.

(16) *Proper Shipping Name*. The name to be used to describe a particular article or substance in all shipping documents and notifications and, where appropriate, on packagings.

(17) *Serious Injury*. An injury which is sustained by a person in an accident and which:

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

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

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

(iv) Involves injury to any internal organ; or

(v) Involves second or third degree burns, or any burns affecting more than 5% of the body surface; or

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

(18) *State of Origin*. The BCAA in whose territory the dangerous goods were first loaded on an aircraft.

(19) *Technical Instructions*. The latest effective edition of the Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO DOC 9284AN/905), including the Supplement and any Addendum, approved and published by decision of the Council of the International Civil Aviation Organisation.

(20) *Unit Load Device.* Any type of aircraft container, aircraft pallet with a net, or aircraft pallet with a net over an igloo.

Note: An overpack is not included in this definition; for a container containingradioactive materials see the definition for freight container.

(21) *UN Number*. The four-digit number assigned by the United Nations Committee of Experts on the Transport of Dangerous Goods to identify a substance or a particular group of substances.

ANTR OPS 3.1155 Operations with a specific approval for the transport of dangerous goods as cargo

(See IEM OPS 3.1155)

The operator shall not transport dangerous goods unless approved to do so by the BCAA.

Before the issue of a specific approval for the transport of dangerous goods, the operator shall satisfy the BCAA that:

(a) an adequate dangerous goods training programme has been established that meets the requirements of ANTR OPS 3.1220 and the Technical Instructions, Part 1, Chapter 4, Table 1-4, as appropriate. Details of the dangerous goods training programme shall be included in the operator’s operations manuals;

(b) that all relevant documents (e.g. for ground handling, aeroplane handling, training) contain information and instructions on dangerous goods, and that there are dangerous goods policies and procedures in its operations manual to meet, at a minimum, the requirements of this Subpart and the Technical Instructions to enable operator personnel to:

(1) identify and reject undeclared or misdeclared dangerous goods, including COMAT classified as dangerous goods;

(2) report to the BCAA and the State in which it occurred any:

(i) occasions when undeclared or misdeclared dangerous goods are discovered in cargo or mail; and

(ii) dangerous goods accidents and incidents;

(3) report to the BCAA and the State of Origin any occasions when dangerous goods are discovered to have been carried;

(i) when not loaded, segregated, separated or secured in accordance with the Technical Instructions, Part 7, Chapter 2; and

(ii) without information having been provided to the pilot-in-command;

(4) accept, handle, store, transport, load and unload dangerous goods, including COMAT classified as dangerous goods as cargo on board an aircraft; and

(5) provide the pilot-in-command with accurate and legible written or printed information concerning dangerous goods that are to be carried as cargo.

(i) for helicopter operations, with the approval of the State of the Operator, the information provided to the pilot-in-command may be abbreviated or briefed by other means (e.g., radio communication, as part of the working flight documentation such as a journey log or operational flight plan) where circumstances make it impractical to produce written or printed information or a dedicated form (see Part S-7;4.8 of the Supplement to the Technical Instructions).

Note 1: The exemption or approval indicated in ANTR OPS 3.1165(b) (1) or (2) is in addition to the *above and the conditions in (b) may not necessarily apply.*

Note 2: Article 35 of the Convention refers to certain classes of cargo restrictions.

ANTR OPS 3.1160 Scope

(a) The operator shall comply with the provisions contained in the Technical Instructions on all occasions when dangerous goods are carried, irrespective of whether the flight is wholly or partly within or wholly outside the territory of a State.

(b) Refer to ICAO Technical Instruction, Part-1, Chapter-1 for the scope, applicability, and the referenced Parts / Chapters therein for the detailed requirements as applicable.

ANTR OPS 3.1165 Limitations on the Transport of Dangerous Goods

(a) The operator shall take all reasonable measures to ensure that articles and substances that are specifically identified by name or generic description in the Technical Instructions as being forbidden for transport under any circumstances are not carried on any helicopter.

(b) The operator shall take all reasonable measures to ensure that articles and substances or other goods that are identified in the Technical Instructions as being forbidden for transportin normal circumstances are only transported when:

(1) They are exempted by the States concerned under the provisions of the Technical Instructions; or

(2) The Technical Instructions indicate they may be transported under an approval issued by the State of Origin.

ANTR OPS 3.1170 Classification

The operator shall take all reasonable measures to ensure that articles and substances are classified as dangerous goods as specified in the Technical Instructions.

ANTR OPS 3.1175 Packing

(See AMC OPS 3.1175)

The operator shall take all reasonable measures to ensure that dangerous goods are packed as specified in the Technical Instructions or in a way which will provide an equivalent level of safety subject to the approval of the BCAA.

ANTR OPS 3.1180 Labelling and Marking

(a) The operator shall take all reasonable measures to ensure that packages, overpacks and freight containers are labelled as specified in the Technical Instructions.

(b) The operator shall take all reasonable measures to ensure packages, overpacks and freight containers are marked as specified in the Technical Instructions. (See AMC OPS 3.1180(b).)

(c) Where dangerous goods are carried on a flight which takes place wholly or partly outsidethe territory of a State, labelling and marking must be in the English language in addition to any other language requirements.

ANTR OPS 3.1185 Dangerous Goods Transport Document

(a) The operator shall ensure that, except when otherwise specified in the TechnicalInstructions, dangerous goods are accompanied by a dangerous goods transport document.

(b) Where dangerous goods are carried on a flight which takes place wholly or partly outsidethe territory of a State, the English language must be used for the dangerous goods transport document in addition to any other language requirements.

ANTR OPS 3.1190 Operators with no Specific Approval for the Transport of Dangerous Goods as Cargo

The operator with no specific approval to transport dangerous goods shall:

(a) establish a dangerous goods training programme that meets the requirements of ANTR OPS 3.1220 and the Technical Instructions, Part 1, Chapter 4, as appropriate. Details of the dangerous goods training programme shall be included in the operator's operations manuals.

(b) establish dangerous goods policies and procedures in its operations manual to meet, at a minimum, the requirements of this Subpart, Annex 18, and the Technical Instructions to allow operator personnel to:

(1) identify and reject undeclared dangerous goods, including COMAT classified as dangerous goods; and

(2) report to the BCAA and the State in which it occurred any:

(i) occasions when undeclared dangerous goods are discovered in cargo or mail; and

(ii) dangerous goods accidents and incidents.

ANTR OPS 3.1195 Acceptance of Dangerous Goods

(a) The operator shall not accept dangerous goods for transport until the package, overpack or freight container has been inspected in accordance with the acceptance procedures in the Technical Instructions.

(b) The operator or his handling agent shall use an acceptance check list. The acceptance check list shall allow for all relevant details to be checked and shall be in such form as will allow for the recording of the results of the acceptance check by manual, mechanical or computerised means.

ANTR OPS 3.1200 Inspection for Damage, Leakage or Contamination

(a) The operator shall ensure that:

(1) Packages, overpacks and freight containers are inspected for evidence of leakage or damage immediately prior to loading on a helicopter, as specified in the Technical Instructions;

(2) Leaking or damaged packages, overpacks or freight containers are not loaded on a helicopter;

(3) Any package of dangerous goods found on a helicopter and which appears to be damaged or leaking is removed or arrangements made for its removal by an appropriate authority or organisation. In this case the remainder of the consignment shall be inspected to ensure it is in a proper condition for transport and that no damage or contamination has occurred

to the helicopter or its load; and

(4) Packages, overpacks and freight containers are inspected for signs of damage or leakage upon unloading from a helicopter and, if there is evidence of damage or leakage, the area where the dangerous goods were stowed is inspected for damage orcontamination.

ANTR OPS 3.1205 Removal of Contamination

(a) The operator shall ensure that:

(1) Any contamination found as a result of the leakage or damage of dangerous goods is removed without delay; and

(2) A helicopter which has been contaminated by radioactive materials is immediately taken out of service and not returned until the radiation level at any accessible surface and the non-fixed contamination are not more than the values specified in the Technical Instructions.

ANTR OPS 3.1210 Loading Restrictions

(See AMC OPS 3.1210(a))

(a) *Passenger Cabin, Flight Deck and Cargo Compartments*. The operator shall ensure that dangerous goods are loaded, segregated, stowed, secured and carried in a helicopter as specified in the Technical Instructions or as approved by the BCAA.

(b) *Dangerous Goods Designated for Carriage Only on Cargo Aircraft*. The operator shallensure that packages of dangerous goods bearing the 'Cargo Aircraft Only' label are carried on a cargo aircraft and loaded as specified in the Technical Instructions.

(c) Packages or overpacks of dangerous goods bearing the “cargo aircraft only” label shall be loaded on a helicopter performing cargo only operations in accordance with Part 7, Chapter 2, Section 4.1 of the Technical Instructions.

ANTR OPS 3.1211 Dispensing or Expending of Dangerous Goods from Helicopter

Note: These provisions refer to operations where dangerous goods are carried on helicopters with the intent to dispense the items in flight (e.g., for the purpose of avalanche control).

(a) Each operator shall prepare and keep current a manual containing operational guidelines and handling procedures for the use and guidance of flight, maintenance and ground personnel concerned in the dispensing or expending of dangerous goods.

(b) No person, other than a required flight crew member, or person necessary for handling or dispensing the dangerous goods, shall be carried on the aircraft.

(c) The operator of the aircraft shall have prior permission for the dispensing or expending of dangerous goods from the owners of any airport to be used.

ANTR OPS 3.1215 Provision of Information

(a) *Information to Ground Staff*. The operator shall ensure that:

(1) Information is provided to enable ground staff to carry out their duties with regard to the transport of dangerous goods, including the actions to be taken in the event of incidents and accidents involving dangerous goods; and

(2) Where applicable, the information referred to in sub-paragraph (a)(1) above is also provided to his handling agent.

(b) *Information to Passengers and Other Persons* (see AMC OPS 3.1215(b))

(1) The operator shall ensure that information is promulgated as required by the Technical Instructions so that passengers are warned as to the types of goods which they are forbidden from transporting aboard a helicopter; and

(2) The operator and, where applicable, his handling agent shall ensure that notices are provided at acceptance points for cargo giving information about the transport of dangerous goods.

(c) *Information to Crew Members*. The operator shall ensure that information is provided in the Operations Manual to enable crew members to carry out their responsibilities in regard to the transport of dangerous goods, including the actions to be taken in the event of emergencies arising involving dangerous goods.

(d) *Information to the Commander*. The operator shall ensure that the commander is provided with written information, as specified in the Technical Instructions (See Table 1 of Appendix 1 to ANTR-OPS 3.1065 for the document storage period).

(e) *Information in the Event of a helicopter Incident or Accident* (See AMC OPS 3.1215(e))

(1) The operator of a helicopter which is involved in a helicopter incident shall, on request, provide any information required to minimise the hazards created by any dangerous goods carried.

(2) The operator of a helicopter which is involved in a helicopter accident shall, as soon as possible, inform the appropriate authority of the State in which the helicopter accident occurred of any dangerous goods carried.

(f) The operator shall ensure that all personnel, including third-party personnel, involved in the acceptance, handling, loading and unloading of cargo are informed of the operator’s specific approval and limitations with regard to the transport of dangerous goods.

ANTR OPS 3.1220 Training Programmes

(See AMC OPS 3.1220)

(See IEM OPS 3.1220)

(a) The operator shall establish and maintain staff training programmes, as required by the Technical Instructions, which shall be approved by the BCAA.

(b) *Operators not holding a permanent approval to carry dangerous goods*. The operator shall ensure that:

(1) Staff who are engaged in general cargo and baggage handling have received training to carry out their duties in respect of dangerous goods. As a minimum this training must cover the areas identified in Column 1 of Table 1 and be to a depth sufficient to ensure that an awareness is gained of the hazards associated with dangerous goods, how to identify them and what requirements apply to the carriage of such goods by passengers; and

(2) The following personnel:

(i) Crew members;

(ii) Passenger handling staff; and

(iii) Security staff employed by the operator who deal with the screening of passengers and their baggage, have received training which, as a minimum, must cover the areas identified in Column 2 of Table 1 and be to a depth sufficient to ensure that an awareness is gained of the hazards associated with dangerous goods, how to identify them and what requirements apply to the carriage of such goods by passengers.

Table 1

AREAS OF TRAINING	**1**	**2**
General philosophy	X	X
Limitations on Dangerous Goods in air transport		X
Package marking and labelling	X	X
Dangerous Goods in passengers baggage	X	X
Emergency procedures	X	X

Note: 'X' indicates an area to be covered.

(c) *Operators holding a permanent approval to carry dangerous goods*. The operator shall ensure that:

(1) Staff who are engaged in the acceptance of dangerous goods have received training and are qualified to carry out their duties. As a minimum this training must cover the areas identified in Column 1 of Table 2 and be to a depth sufficient to ensure the staff can take decisions on the acceptance or refusal of dangerous goods offered for carriage by air;

(2) Staff who are engaged in ground handling, storage and loading of dangerous goods have received training to enable them to carry out their duties in respect of dangerous goods. As a minimum this training must cover the areas identified in Column 2 of Table 2 and be to a depth sufficient to ensure that an awareness is gained of the hazards associated with dangerous goods, how to identify such goods and how to handle and load them;

(3) Staff who are engaged in general cargo and baggage handling have received trainingto enable them to carry out their duties in respect of dangerous goods. As a minimum this training must cover the areas identified in Column 3 of Table 2 and be to a depth sufficient to ensure that an awareness is gained of the hazards associated with dangerous goods, how to identify such goods, how to handle and load them and what requirements apply to the carriage of such goods by passengers;

(4) Flight crew members have received training which, as a minimum, must cover the areas identified in Column 4 of Table 2. Training must be to a depth sufficient to ensure that an awareness is gained of the hazards associated with dangerous goods and how they should be carried on a helicopter; and

(5) The following personnel:

(i) Passenger handling staff;

(ii) Security staff employed by the operator who deal with the screening of passengers and their baggage; and

(iii) Crew members other than flight crew members, have received training which, as a minimum, must cover the areas identified in Column 5 of Table 2. Training must be to a depth sufficient to ensure that an awareness is gained of the hazards associated with dangerous goods and what requirements apply to the carriage of such goods by passengers or, more generally, their carriage on a helicopter.

Table 2

AREAS OF TRAINING	1	2	3	4	5
Limitations on Dangerous Goods in air transport	X	X		X	X
Classification of Dangerous Goods	X				
List of Dangerous Goods	X	X		X	
Packaging specifications and markings	X				
Storage and loading procedures	X	X	X	X	
Dangerous Goods in passengers baggage	X		X	X	X
Emergency procedures	X	X	X	X	X

Note: ‘x’ indicates an area to be covered.

(d) The operator shall ensure that all staff who receive training undertake a test to verify understanding of their responsibilities.

(e) The operator shall ensure that all staff who require dangerous goods training receive recurrent training at intervals of not longer than 2 years.

(f) The operator shall ensure that records of dangerous goods training are maintained for all staff trained in accordance with sub-paragraph (d) above.

(g) The operator shall ensure that his handling agent's staff are trained in accordance with the applicable column of Table 1 or Table 2.

ANTR OPS 3.1225 Dangerous Goods Incident and Accident Reports

(See AMC OPS 3.1225)

(a) The operator shall report dangerous goods incidents and accidents to the BCAA. An initial report shall be despatched within 72 hours of the event unless exceptional circumstances prevent this.

(b) The operator shall also report to the BCAA undeclared or misdeclared dangerous goods discovered in cargo or passengers’ baggage. An initial report shall be despatched within 72 hours of the discovery unless exceptional circumstances prevent this.

ANTR OPS 3.1230 *Intentionally blank*

SUBPART S – SECURITY

ANTR OPS 3.1235 Security requirements

The operator shall ensure that all appropriate personnel are familiar, and comply, with therelevant requirements of the national security programmes of the State of the operator.

ANTR OPS 3.1240 Training programmes

The operator shall establish, maintain and conduct approved training programmes which enable the operator's personnel to take appropriate action to prevent acts of unlawful interference such as sabotage or unlawful seizure of helicopters and to minimise the consequences of such events should they occur.

ANTR OPS 3.1245 Reporting acts of unlawful interference

Following an act of unlawful interference on board a helicopter the commander or, in his absence the operator, shall submit, without delay, a report of such an act to the designated local authority and the BCAA in the State of the operator.

ANTR OPS 3.1250 Helicopter search procedure checklist

The operator shall ensure that all helicopters carry a checklist of the procedures to be followed for that type in searching for concealed weapons, explosives, or other dangerous devices. The operator shall also support the checklist with guidance on the course of action to be taken should a bomb or suspicious object be found.

ANTR OPS 3.1255 Flight crew compartment security

If installed, the flight crew compartment door on all helicopters operated for the purpose of carrying passengers shall be capable of being locked from within the compartment in order to prevent unauthorised access.

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SECTION 2

ADVISORY CIRCULAR (AC) / ACCEPTABLE MEANS OF COMPLIANCE (AMC) / INTERPRETATIVE AND EXPLANATORY MATERIAL (IEM)

1 *GENERAL*

1.1 This Section contains Advisory Circulars (AC), Acceptable Means of Compliance and Interpretative/Explanatory Material that has been agreed for inclusion in ANTR OPS 3.

1.2 Where a particular ANTR paragraph does not have an Advisory Circulars (AC), Acceptable Means of Compliance or any Interpretative/Explanatory Material, it is considered that no supplementary material is required.

2 *PRESENTATION*

2.1 The Advisory Circular, Acceptable Means of Compliance and Interpretative/Explanatory Material are presented in full page width on loose pages, each page being identified by the date of issue.

2.2 A numbering system has been used in which the Advisory Circular, Acceptable Means of Compliance or Interpretative/Explanatory Material uses the same number as the ANTR paragraph to which it refers. The number is introduced by the letters AMC or IEM to distinguish the material from the ANTR itself.

2.3 The acronyms AMC and IEM also indicate the nature of the material and for this purpose the two types of material are defined as follows:

Advisory Circulars (ACs) provide guidelines on a subject matter, such as how to comply with a regulation.

Acceptable Means of Compliance (AMC) illustrate a means, or several alternative means, but not necessarily the only possible means by which a requirement can be met. It should however be noted that where a new AMC is developed, any such AMC (which may be additional to an existing AMC) will be amended into the document following consultation under the NPA procedure.

Interpretative/Explanatory Material (IEM) helps to illustrate the meaning of a requirement.

2.4 New AMC or IEM material may, in the first place, be made available rapidly by being published as a Temporary Guidance Leaflet (TGL) or Civil Aviation Publication (CAP).

Note: Any person who considers that there may be alternative AMCs or IEMs to those published should submit details to the BCAA, for alternatives to be properly considered.

2.5 New, amended and corrected text will be indicated with a side bar beside paragraphs, until a subsequent "amendment" is issued.

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AC/AMC/IEM B – GENERAL

AC to Appendix 1 to ANTR OPS 3.005(d)
The HEMS philosophy
See Appendix 1 to ANTR OPS 3.005(d)

1 Introduction

This AC outlines the HEMS philosophy. Starting with a description of acceptable risk and introducing a taxonomy used in other industries, it describes how risk has been addressed in the HEMS appendix to provide a system of safety to the appropriate standard. It discusses the difference between HEMS, Air Ambulance and SAR - in regulatory terms. It also discusses the application of Operations to Public Interest Sites in the HEMS context.

2 Acceptable risk

The broad aim of any aviation legislation is to permit the widest spectrum of operations with the minimum risk. In fact it may be worth considering who/what is at risk and who/what is being protected. Three groups are being protected:

- Third parties (including property) - highest protection.
- Passengers (including patients)
- Crew members (including task specialists) - lowest

It is for the BCAA to facilitate a method for the assessment of risk - or as it is more commonly known, safety management.

3 Risk management

Safety management textbooks[1] describe four different approaches to the management of risk. All but the first have been used in the production of the HEMS appendix and, if we consider that the engine failure accountability of Class I performance equates to zero risk, then all four are used (this of course is not strictly true as there are a number of helicopter parts - such as the tail rotor which, due to a lack of redundancy, cannot satisfy the criteria):

Applying the taxonomy to HEMS gives:

- Zero Risk; no risk of accident with a harmful consequence - Class 1 performance (within the qualification stated above) - the HEMS Operating Base.
- De Minimis; minimised to an acceptable safety target - for example the exposure time concept where the target is less than 5×10^{-8} (in the case of elevated landing sites at hospitals in a congested hostile environment the risk is contained to the deck edge strike case - and so in effect minimised to an exposure of seconds).
- Comparative Risk; comparison to other exposure - the carriage of a patient with a spinal injury in an ambulance that is subject to ground effect compared to the risk of a HEMS flight (consequential and comparative risk).
- As Low as Reasonably Practical; where additional controls are not economically or reasonably practical - operations at the HEMS operational site (the accident site).

It is stated in ANTR OPS 3.005(d) that "...HEMS operations shall be conducted in accordance with the requirement contained in ANTR OPS 3 except for the variations contained in Appendix 1 to ANTR OPS 3.005(d) for which a special approval is required."

In simple terms there are three areas in HEMS operations where risk, beyond that allowed in the main body of ANTR OPS 3, is defined and accepted:

- in the en-route phase; where alleviation is given from height and visibility rules;
- at the accident site; where alleviation is given from the performance and size requirement; and
- at an elevated hospital site in a congested hostile environment; where alleviation is given from the deck edge strike - providing elements of the Appendix 1 to ANTR OPS 3.517(a) are satisfied.

In mitigation against these additional and considered risks, experience levels are set, specialist training is required (such as instrument training to compensate for the increased risk of inadvertent entry into cloud); and operation with two crew (two pilots, or one pilot and a HEMS crew member) is mandated. (HEMS crews - including medical passengers - are also expected to operate in accordance with good CRM principles.)

4 Air ambulance

In regulatory terms, air ambulance is considered to be a normal transport task where the risk is no higher than for operations to the full ANTR OPS 3 compliance. This is not intended to contradict/complement medical terminology but is simply a statement of policy; none of the risk elements of HEMS should be extant and therefore none of the additional requirements of HEMS need be applied.

If we can provide a road ambulance analogy:

- If called to an emergency; an ambulance would proceed at great speed, sounding its siren and proceeding against traffic lights - thus matching the risk of operation to the risk of a potential death (= HEMS operations).
- For a transfer of a patient (or equipment) where life and death (or consequential injury of ground transport) is not an issue; the journey would be conducted without sirens and within normal rules of motoring - once again matching the risk to the task (= air ambulance operations).

The underlying principle is; the aviation risk should be proportional to the task.

It is for the medical professional to decide between HEMS or air ambulance - not the pilot! For thatreason, medical staff who undertake to task medical sorties should be fully aware of the additional risks that are (potentially) present under HEMS operations (and the pre-requisite for the operator to hold a HEMS approval). (For example in some countries, hospitals have principle and alternative site s. The patient may be landed at the safer alternative site (usually in the grounds of the hospital) thus eliminating risk - against the small inconvenience of a short ambulance transfer from the site to the hospital.)

Once the decision between HEMS or air ambulance has been taken by the medical professional, the commander makes an operational judgement over the conduct of the flight.

Simplistically, the above type of air ambulance operations could be conducted by any operator holding an AOC (HEMS operators hold an AOC) - and usually are when the carriage of medical supplies (equipment, blood, organs, drugs etc.) is undertaken and when urgency is not an issue.

5 Search and rescue (SAR)

SAR operations, because they are conducted with substantial alleviations from operational and performance standards; are strictly controlled; the crews are trained to the appropriate standard; and they are held at a high state of readiness. Control and tasking is usually exercised by the Police (or the Military or Coastguard in a maritime State) and mandated under State Regulations.

It was not intended when ANTR OPS 3 was introduced, that HEMS operations would be conducted by operators not holding an AOC or operating to other than HEMS standards. It was also not expected that the SAR label would be used to circumvent the intent of ANTR OPS 3 or permit HEMS operations to a lesser standard.

6 Operating under a HEMS approval

The HEMS appendix originally contained the definitions for Air Ambulance and SAR - introduced to clarify the differences between the three activities. In consideration that, in some States, confusion has been the result, all references to activities other than HEMS have now been removed from the appendix and placed into AC material.

There are only two possibilities; transportation as passengers or cargo under the full auspices of ANTR OPS 3 (this does not permit any of the alleviations of the HEMS appendix - landing and take-off performance must be in compliance with the performance subparts of ANTR OPS 3); or operations under a HEMS approval.

7 HEMS operational sites

The HEMS philosophy attributes the appropriate levels of risk for each operational site; this is derived from practical considerations and in consideration of the probability of use. The risk i s expected to be inversely proportional to the amount of use of the site. The types of site are:

HEMS operating base; from which all operations will start and finish. There is a high probability of a large number of take-offs and landings at this heliport or landing location and for that reason no alleviation from operating procedures or performance rules are contained in the HEMS appendix.

HEMS operating site; because this is the primary pick up site related to an incident or accident, its use can never be pre-planned and therefore attracts alleviations from operating procedures and performance rules - when appropriate.

The hospital site; is usually at ground level in hospital grounds or, if elevated, on a hospital building. It may have been established during a period when performance criteria was not a consideration. The amount of use of such sites depends on their location and their facilities; normally, it will be greater than that of the HEMS operating site but less than for a HEMS operating base. Such sites attract some alleviations under the HEMS rules.

8 Problems with hospital sites

During implementation of ANTR OPS 3, it was established that a number of States had encountered problems with the impact of performance rules where helicopters were operated for HEMS. AlthoughStates accept that progress should be made towards operations where risks associated with a cr itical power unit failure are eliminated, or limited by the exposure time concept, a number of landing sites exist which do not (or never can) allow operations to Performance Class 1 or 2 requirements.

These sites are generally found in a congested hostile environment:

- in the grounds of hospitals; or
- on hospital buildings;

The problem of hospital sites is mainly historical and, whilst the BCAA could insist that such sites not be used - or used at such a low weight that critical power unit failure performance is assured, it would seriously curtail a number of existing operations.

Even though the rule for the use of such sites in hospital grounds for HEMS operations (Appendix 1 to ANTR OPS 3.005(d) sub-paragraph (c)(2)(i)(A)) attracts alleviation until 2005, it is only partial and will still impact upon present operations.

Because such operations are performed in the public interest, it was felt that the BCAA should be able to exercise its discretion so as to allow continued use of such sites provided th at it is satisfied that an adequate level of safety can be maintained - notwithstanding that the site does not allow operations to Performance Class 1 or 2 standards. However, it is in the interest of continuing improvements in safety that the alleviation of such operations be constrained to existing sites, and for a limited period.

It is felt that the use of public interest sites should be controlled. This will require that a directory of sites be kept and approval given only when the operator has an entry in the Route Manual Section of the Operations Manual.

The directory (and the entry in the Operations Manual) should contain for each approved site; the dimensions; any non-conformance with Annex 14; the main risks; and, the contingency plan should an incident occur. Each entry should also contain a diagram (or annotated photograph) showing the main aspects of the site.

9 Summary

In summary, the following points are considered to be germane to the philosophy and HEMS regulations:

- Absolute levels of safety are conditioned by society.
- Potential risk must only be to a level appropriate to the task.
- Protection is afforded at levels appropriate to the occupants.
- The HEMS appendix addresses a number of risk areas and mitigation is built in.
- Only HEMS operations are dealt with by the appendix.
- There are three main categories of HEMS sites and each is addressed appropriately.
- State alleviation from the requirement at a hospital site is available but such alleviations should be strictly controlled by a system of registration.
- SAR is a State controlled activity and the label should not be used by operators to circumvent HEMS regulations.

10 References

a. Managing the Risks of Organizational Accidents - Professor James Reason.

AC to Appendix 1 to ANTR-OPS 3.005(d), paragraph (a)(4)
HEMS mission
(See Appendix 1 to ANTR-OPS 3.005(d), paragraph (a)(4))

1 A HEMS mission normally starts and ends at the HEMS Operating Base following tasking by the “HEMS Dispatch Centre”. Tasking can also occur when airborne, or on the ground at locations other than the HEMS Operating Base.

2 It is intended that the following elements be regarded as integral parts of the HEMS mission

- flights to and from the HEMS Operating Site when initiated by the HEMS Dispatch Centre;
- flights to and from a heliport or landing location for the delivery or pick-up of medical supplies and/or persons required for completion of the HEMS mission;
- flights to and from a heliport or landing location for refuelling required for completion of the HEMS mission.

All these flights are subject to the applicable requirements and alleviations of the HEMS appendix.]

AC to Appendix 1 to ANTR OPS 3.005(d) sub-paragraph (b)
HEMS - Contents of the Operations Manual
See Appendix 1 to ANTR OPS 3.005(d) sub-paragraph (b)

1 The Operations Manual should contain instructions for the conduct of flights, adapted to the operations area, including at least the following:

a. operating minima;

b. recommended routes for regular flights to surveyed sites (with the minimum flight altitude);

c. guidance for the selection of the HEMS operating site in case of a flight to an unsurveyed site;

d. the safety altitude for the area overflown; and

e. procedures to be followed in case of inadvertent entry into cloud.

AC to Appendix 1 to ANTR OPS 3.005(d) sub-paragraph (c)(2)(i)(B)
Operations to a HEMS operating site located in a hostile environment
See Appendix 1 to ANTR OPS 3.005(d) sub-paragraph (c)(2)(i)(B)

The alleviation from engine failure accountability at a HEMS Operating Site extends to HEMS/HHO where: a HEMS crew member; or a medical passenger; or ill or injured persons and other persons directly involved in the HEMS flight - are required to be hoisted as part of the HEMS flight.

IEM to Appendix 1 to ANTR OPS 3.005(d), sub-paragraph (c)(2)(i)(C)
HEMS operating site
See Appendix 1 to ANTR OPS 3.005(d) sub-paragraph (c)(2)(i)(C)

When selecting a HEMS operating site it should have a minimum dimension of at least 2D. For night operations, unsurveyed HEMS operating sites should have dimensions of at least 4D in length and 2D in width.

AC to Appendix 1 to ANTR OPS 3.005(d) sub-paragraph (c)(3)(ii)(B)
Relevant Experience
See Appendix 1 to ANTR OPS 3.005(d) sub-paragraph (c)(3)(ii)(B)

The experience considered should take into account the geographical characteristics (sea, mountain, big cities with heavy traffic, etc.)

AC to Appendix 1 to ANTR OPS 3.005(d) sub-paragraph (c)(3)(iii)
Recency
See Appendix 1 to ANTR OPS 3.005(d) sub-paragraph(c)(3)(iii)

For the purposes of this requirement, recency may be obtained in a VFR helicopter using vision limiting devices such as goggles or screens, or in a FSTD.

AC to Appendix 1 to ANTR OPS 3.005(d), sub-paragraph (c)(3)(iv)
HEMS crew member
See Appendix 1 to ANTR OPS 3.005(d), sub-paragraph (c)(3)(iv)

1. When the crew is composed of one pilot and one HEMS crew member, the latter should be seated inthe front seat (co-pilot seat) during the flight, so as to be able to accomplish the tasks that the commander may delegate, as necessary:

a. assistance in navigation;

b. assistance in radio communication/ radio navigation means selection;

c. reading of check-lists;

d. monitoring of parameters;

e. collision avoidance;

f. assistance in the selection of the landing site;

g. assistance in the detection of obstacles during approach and take-off phases;

2. The commander may also delegate to the HEMS crew member tasks on the ground:

a. assistance in preparing the helicopter and dedicated medical specialist equipment for subsequent HEMS departure;

AC to Appendix 1 to ANTR OPS 3.005(d), sub-paragraph (c)(3)(iv)b. assistance in the application of safety measures during ground operations with rotors turning (including: crowd control, embarking and disembarking of passengers, refuelling etc.).

3. When a HEMS crew member is carried it is his primary task to assist the commander. However, there are occasions when this may not be possible:

a. At a HEMS operating site a commander may be required to fetch additional medical supplies, the HEMS crew member may be left to give assistance to ill or injured persons whilst the commander undertakes this flight. (This is to be regarded as exceptional and is only to be conducted at the discretion of the commander, taking into account the dimensions and environment of the HEMS operating site.)

b. After arriving at the HEMS Operating Site, the installation of the stretcher may preclude the HEMS crew member from occupying the front seat.

c. If the medical passenger requires the assistance of the HEMS crew member in flight.

d. If the alleviations of 3.a, 3.b or 3.c are used, reduction of operating minima contained in Appendix 1 to ANTR OPS 3.005(d), sub-paragraph (c)(4) should not be used.

e. With the exception of 3.a above, a commander should not land at a HEMS operating site without the HEMS crew member assisting from the front seat (copilot seat).

4. When two pilots are carried, there is no requirement for a HEMS crew member provided that the pilot non-flying (PNF) performs the aviation tasks of a HEMS crew member.

AMC to Appendix 1 to ANTR OPS 3.005(d), sub-paragraph (c)(3)(iv)(B)(B2)
Helicopter Emergency Medical Service
See Appendix 1 to ANTR OPS 3.005(d), sub-paragraph (c)(3)(iv)(B)(B2)

A flight following system is a system providing contact with the helicopter throughout its operational area.

AC to Appendix 1 to ANTR OPS 3.005(d), sub-paragraph (e)(1)(ii)(B)
Line checks
See Appendix 1 to ANTR OPS 3.005(d), sub-paragraph (e)(1)(ii)(B)

Where due to the size, the configuration, or the performance of the helicopter, the line check cannot be conducted on an operational flight, it may be conducted on a specially arranged representative flight. This flight may be immediately adjacent to, but not simultaneous with, one of the biannual profic iency checks.

IEM to Appendix 1 to ANTR OPS 3.005(d), sub-paragraph (e)(4)
Ground Emergency Service Personnel
See Appendix 1 to ANTR OPS 3.005(d), sub-paragraph (e)(4)

The task of training large numbers of emergency service personnel is formidable. Where ver possible, helicopter operators should afford every assistance to those persons responsible for training emergency service personnel in HEMS support.

IEM to Appendix 1 to ANTR OPS 3.005(e)
Helicopter operations over a hostile environment located outside a congested area
See Appendix 1 to ANTR OPS 3.005(e)

1 The subject Appendix has been produced to allow a number of existing operations to continue. It is expected that the alleviation will be used only in the following circumstances:

1.1 *Mountain Operations;* where present generation multi-engined aircraft cannot meet the requirement of Performance Class 1 or 2 at altitude.

1.2 *Operations in Remote Areas;* where existing operations are being conducted safely; and where alternative surface transportation will not provide the same level of safety as single-engined helicopters; and where, because of the low density of population, economic circumstances do not justify the replacement of single-engined by multi-engined helicopters (as in the case of remote arctic settlements).

2 The BCAA should give prior approval.

AC to Appendix 1 to ANTR OPS 3.005(f) sub-paragraph (b)(3) and Appendix 1 to ANTR OPS 3.005(g) sub-paragraph (a)(3)
Local operations
See Appendix 1 to ANTR OPS 3.005(f) sub-paragraph (b)(3) and Appendix 1 to ANTR OPS 3.005(g) sub-paragraph (a)(3)

1. Part of Appendix 1 to ANTR OPS 3.005(f) (and the whole of Appendix 1 to ANTR OPS 3.005(g)) contain alleviations for “local operations”. For such operations it is intended that approval will constrain thedefinition of “local” to be within a distance of 20 - 25nm. However, such arbitrary distances have always presented difficulties as there are always special factors which could influence such a decision. Authorities are therefore not expected to authorise local operations beyond 25nm without good operational reasons.

2. In defining “local operations” (as described in 1. above), the BCAA should, except where such operations specifically “include” cross border excursions (such as sight-seeing flights in Saudi airspace), constrain operations to be within the State boundary.

AC to Appendix 1 to ANTR OPS 3.005(f) paragraph (d)(19)
Recent experience (designated groups)
(See Appendix 1 to ANTR OPS 3.005(f) paragraph (d)(19))

1. The following helicopters and designated groups (which contain helicopters with similar characteristics) may be used for the purpose of recency obtained in accordance with Appendix 1 to ANTR OPS 3.005(f) paragraph (d)(19):

(a) Group 1 - Bell 206/206L, Bell 407.

(b) Group 2 - Hughes 369, MD 500 N, MD 520 N, MD 600.

(c) Group 3 - SA 341/342, EC 120, EC 130.

(d) Group 4 - SA 313/318, SA 315/316/319, AS 350.

(e) Group 5 - (All types listed in Appendix 1 to ANTR-FCL 2.245(b)(3)), R22, R44.

2. Additional groups may be constructed or other types may be added to the designated groups if acceptable to the BCAA.

IEM to Appendix 1 to ANTR OPS 3.005(f)
Operations for small helicopters (VFR day only)
See Appendix 1 to ANTR OPS 3.005(f)

1. Appendix 1 to ANTR OPS 3.005(f) contains prohibitions and alleviations when operating small helicopters VFR day only.

1.1 Where a rule in ANTR OPS 3 contains a paragraph that already allows an alternative method of compliance to be submitted for approval it is not discussed (in this IEM or the Appendix).

1.2 Where a rule is partially applicable (some paragraphs IFR some paragraphs VFR), the rule is not referenced (in this IEM or the Appendix) and normal interpretation should be applied.

2. The following rules are considered not to apply for small helicopters operating to Appendix 1 to ANTR OPS 3.005(f):

ANTR OPS 3.075 Method of carriage of persons

ANTR OPS 3.105 Unauthorised carriage

ANTR OPS 3.225 Heliport or Landing Location Operating Minima

ANTR OPS 3.230 Departure and Approach procedures

ANTR OPS 3.295 Selection of heliports or landing locations

ANTR OPS 3.395 Ground proximity detection

ANTR OPS 3.405 Commencement and continuations of approach

Subpart E except ANTR OPS 3.465 and Appendix 1 to ANTR OPS 3.465

ANTR OPS 3.652 IFR or night operations - Flight and navigational instruments and associated equipment

ANTR OPS 3.655 Additional equipment for single pilot operation under IFR

ANTR OPS 3.670 Airborne Weather Radar Equipment

ANTR OPS 3.695 Public address system

ANTR OPS 3.700 Cockpit voice recorders 1

ANTR OPS 3.705 Cockpit voice recorders 2

ANTR OPS 3.715 Flight data recorders 1

ANTR OPS 3.720 Flight data recorders 2

ANTR OPS 3.810 Megaphones

ANTR OPS 3.815 Emergency lighting

ANTR OPS 3.855 Audio Selector Panel

ANTR OPS 3.865 Communication and Navigation equipment for operations under IFR, or under VFR over routes not navigated by reference to visual landmarks

AC to Appendix 1 to ANTR OPS 3.005(h), sub-paragraph (d)(2)(iv)
Criteria for two pilot HHO
See Appendix 1 to ANTR OPS 3.005(h), sub-paragraph (d)(2)(iv)

A crew of two pilots may be required when:

1. The weather conditions are below VFR minima at the offshore vessel or structure.

2. There are adverse weather conditions at the HHO site (i.e. turbulence, vessel movement, visibility).

3. The type of helicopter requires a second pilot to be carried because of cockpit visibility; or handling characteristics; or lack of automatic flight control systems.

AC to Appendix 1 to ANTR OPS 3.005(i)
Helicopter operations to/from a public interest site
See Appendix 1 to ANTR OPS 3.005(i)

1 General

Appendix 1 to ANTR OPS 3.005(i) - containing alleviations for public interest sites - was introduced in January 2002 to address problems that had been encountered by member States at hospital (and lighthouse) sites due to the applicable performance requirements of Subparts G and H. These problems were enumerated in AC to Appendix 1 to ANTR OPS 3.005(d) paragraph 8, part of which is reproduced below.

“8 Problems with hospital sites

During implementation of JAR-ANTR OPS 3, it was established that a number of JAA States had encountered problems with the impact of performance rules where helicopters were operated for HEMS. Although States accept that progress should be made towards operations where risks associated witha critical power unit failure are eliminated, or limited by the exposure time concept, a number of landing sites exist which do not (or never can) allow operations to Performance Class 1 or 2 requirements.

These sites are generally found in a congested hostile environment:

- *in the grounds of hospitals; or*
- *on hospital buildings;*

The problem of hospital sites is mainly historical and, whilst the BCAA could insist that such sites not be used - or used at such a low weight that critical power unit failure performance is assured, it would seriously curtail a number of existing operations.

Even though the rule for the use of such sites in hospital grounds for HEMS operations (Appendix 1 to ANTR OPS 3.005(d) sub-paragraph (c)(2)(i)(A)) attracts alleviation until 2005, it is only partial and will still impact upon present operations.

Because such operations are performed in the public interest, it was felt that the BCAA should be able to exercise its discretion so as to allow continued use of such sites provided that it is satisfied that an adequate level of safety can be maintained - notwithstanding that the site does not allow operations to Performance Class 1 or 2 standards. However, it is in the interest of continuing improvements in safety that the alleviation of such operations be constrained to existing sites, and for a limited period. “.

2. Public Interest Sites after 1 January 2005

Although elimination of such sites would remove the problem, it is recognized that phasing ou t, or rebuilding existing hospital and lighthouse heliports or landing locations, is a long-term goal which may not be cost-effective, or even possible, in some States.

It should be noted however that existing paragraph (c) of the appendix limits the pro blem by confining approvals to public interest sites established before 1 July 2002 (established in this context means either: built before that date; or brought into service before that date – this precise wording was used to avoid problems associated with a ground level heliport or landing location where no building would be required). Thus the problem of these sites is contained and reducing in severity. This date was set approximately 6 months after the intended implementation of this original appendix.

From 1st January 2005 the approval of a public interest site will be confined to those sites where a CAT A procedure alone cannot solve the problem. The determination of whether the helicopter can or cannot be operated in accordance with Subpart G (Performance Class 1) should be established with the helicopter at a realistic payload and fuel to complete the mission. However, in order to reduce the risk at those sites, the application of the requirements contained in paragraph (d)(2) of the appendix will be required.

Additionally and in order to promote understanding of the problem, the text contained in paragraph (e)of the appendix has been amended to refer to Subpart G of ANTR OPS 3 and not to Annex 14 as in the original appendix. Thus Part C of the Operations Manual should reflect the non-conformance with that Subpart.

The following paragraphs discuss the problem and solutions.

3. The problem associated with public interest sites

There are a number of problems: some of which can be solved with the use of appropr iate helicopters and procedures; and others which, because of the size of the heliport or landing location or the obstacle environment, cannot. They consist of:

a. Helicopters that cannot meet the performance criteria required by Subpart G;

b. The size of the FATO of the heliport or landing location (smaller than that required by the manufacturers’ procedure);

c. An obstacle environment that prevents the use of the manufacturers procedure (obstacles in the back - up area)

d. An obstacle environment that does not allow recovery following a power unit failure in the critical phaseof take-off (a line of buildings requiring a demanding gradient of climb) at a realistic payload and fuel to complete the mission.

e. A ground level heliport or landing location (exposure is not permitted);

3.1 *Problems associated with a*; it was recognised at the time of the adoption of the original appendix that, although the number of helicopters not meeting the absolute performance criteria of a. above were dwindling, existing HEMS and lighthouse fleets could not be replaced until 2005. (There is still a possibility that limited production will not allow the complete replacement of such limited power helicopters before the 2004 date; it is therefore suggested that Authorities should, providing an order position can be established by the operator, allow the continued use of such helicopters for a limited period, without the additional mitigation required by paragraph (d)(2) of the appendix.)

3.2 *Problems associated with b.*; the inability to climb and conduct a rejected landing back to the heliport or landing location following an engine failure before the Decision Point (DP).

3.3 *Problems associated with c*.; as in b.

3.4 *Problems associated with d;* climb into an obstacle following an engine failure after DP.

3.5 *Problems associated with e.*; may be related to;

- the size of the FATO which is too small for the manufacturers' procedure;
- no room for back-up;
- an obstacle in the take-off path; or
- a mixture of all three.

With the exception of case a., problems cannot be solved in the immediate future but can, when mitigated with the use of the latest generation of helicopters (operated at a weight that can allow useful payloads and endurance), minimise exposure to risk.

4. Long Term Solution

Although not offering a complete solution, it was felt that a significant increase in safety could be achieved by applying an additional performance margin to such operations. This solution could also be seen as mitigation proportional to the problem and would allow the time restriction of 2004 to be removed.

The required performance level of 8% climb gradient in the first segment, reflects ICAO Annex 14 Volume II in Table 4-3 – Dimensions and slopes of obstacle limitations surfaces for Performance Class 2.

The performance delta is achieved without the provision of further manufacturers data by using existing graphs to provide the RTOM.

If we examine the solution in relation to the original problem the effects can be seen.

4.1 *Solution with relation to b.;* although the problem still exists, the safest procedure is a dynamic take-off reducing the time taken to achieve Vstayup and thus allowing VFR recovery – if the failure occurs at or after Vy and 200 feet, an IFR recovery is possible.

4.2 *Solution with relation to c.;* as in b. above.

4.3 *Solution with relation to d.;* once again this does not give a complete solution, however the performance delta minimise the time during which a climb over the obstacle cannot be achieved.

4.4 *Solution with relation to e.;* as in 4.1 to 4.3 above.

AC to Appendix 1 to ANTR OPS 3.005(i) sub-paragraph (a)(1)
Improvement program for Public Interest Sites
(See Appendix 1 to ANTR OPS 3.005(i) sub-paragraph (a)(1)

1. General

Although it is accepted that there will be a number of public interest sites that will remain for some time, it is in the interest of safety that the numbers are reduced and eventually, as a goal, all sites eliminated. A reduction of sites can be achieved in two ways:

a. By an improvement in the performance of helicopters such that HOGE OEI is possible at weights where the mission can be performed.

b. By the use of a site improvement program: to take out of service those sites where the exposure is greatest; or by improving sites such that the performance requirement can be met.

2. Improvement in Performance

The advent of more powerful modern twin-engine helicopters has put into reach the ability to achieve the aim stated in 1.a. above. A number of these helicopters are, in 2003, almost at the point where HOGE OEI with mission payload is possible. However, although technically feasible, it is not economically justifiable to require an immediate and complete re-equipping of all HEMS fleets.

3. Improvement of Sites

Where a site could be improved by redevelopment, for example by increasing the size of the FATO, it should be done; where the problems of a site are due to the obstacle environment, a program to re -site the facility or remove the obstacle(s) should be a undertaken as a priority.

4. Summary

As was stated in paragraph 1. above, it is in the interest of States to reduce the risk of an accident due to an engine failure on take-off or landing. This could be achieved with a combination of policies: the use more appropriate helicopters; or, improvement by redevelopment of a site; or, the re-siting of facilities to alternative locations.

Some States have already undertaken to remove or improve public interest sites by using one, or more of the above methods. For those States where a compliance program is under way, the choice of reduction by elimination or redevelopment should not be put on hold whilst waiting for new generation helicopters. The improvement policy should be achieved in a reasonable time horizon – and this should be an element of the compliance program.

The approval to operate to public interest sites could be conditional upon such improvement programs being put into place. Unless such a policy is instituted, there will be no incentive for public interest sites to be eliminated in a reasonable time horizon.

AC to Appendix 1 to ANTR OPS 3.005(i) sub-paragraph (d)(2)
Helicopter mass limitation for operations at a public interest site
(See Appendix 1 to ANTR OPS 3.005(i) sub-paragraph (d)(2))

The helicopter mass limitation at take-off or landing specified in Appendix 1 to ANTR OPS 3.005(i) sub-paragraph (d)(2) should be determined using the climb performance data from 35 ft to 200 ft at Vtoss (First segment of the take-off flight path) contained in the Category A supplement of the Helicopter Flight Manual (or equivalent manufacturer data acceptable to the BCAA according to IEM OPS 3.480(a)(1) and (a)(2)).

The first segment climb data to be considered is established for a climb at the take-off safety speed Vtoss, with the landing gear extended (when the landing gear is retractable), with the critical power unit inoperative and the remaining power units operating at an appropriate power rating (the 2 min 30 sec or 2 min One Engine Inoperative power rating, depending on the helicopter type certification). The appropriate Vtoss, is the value specified in the Category A performance section of the Helicopter Flight Manual for vertical take-off and landing procedures (VTOL or Helipad or equivalent).

The ambient conditions at the heliport or landing location (pressure-altitude and temperature) should be taken into account.

The data is usually provided in charts one of the following ways:

- Height gain in ft over a horizontal distance of 100 ft in the first segment configuration (35 ft to 200 ft, Vtoss, 2 min 30 sec / 2 min OEI power rating). This chart should be entered with a height gain of 8 ft per 100 ft horizontally travelled, resulting in a mass value for every pressure-altitude/temperature combination considered.
- Horizontal distance to climb from 35 ft to 200 ft in the first segment configuration (Vtoss, 2 min 30 sec / 2 min OEI power rating). This chart should be entered with a horizontally distance of 628 m (2 062 ft), resulting in a mass value for every pressure-altitude/temperature combination considered.
- Rate of climb in the first segment configuration (35 ft to 200 ft, Vtoss, 2 min 30 sec / 2 min OEI power rating). This chart can be entered with a rate of climb equal to the climb speed (Vtoss) value in knots(converted to True Airspeed) multiplied by 8·1, resulting in a mass value for every pressure- altitude/temperature combination considered.

AC OPS 3.010
Exemptions
See ANTR OPS 3.010

1 General

1.1 Compliance with BCAA's regulatory requirements is obligatory. However, on some occasions, there might be instances where full compliance is not feasible. In those instances, BCAA may grant an exemption from the Air Navigation Technical Regulations (ANTRs) when satisfied that there is a need and subject to compliance with any supplementary condition that BCAA considers necessary in order to ensure an acceptable level of safety in the particular case. Such measures must be supported by appropriate, robust and documented safety risk assessments or aeronautical studies and imposition of limitations, conditions or mitigation measures, as appropriate.

1.2 Any interested person may apply to BCAA for an exemption from the regulations.

1.3 Only BCAA may issue exemptions, and no person may take or cause to be taken any action not in compliance with the regulations unless BCAA has issued an applicable exemption to the person.

1.4 An exemption should not be regarded by applicants as a means to circumvent the requirements. Similarly, it should not be regarded as the primary solution to an operational difficulty faced by an operator. An exemption should only be requested by an operator or maintenance organisation (and considered by BCAA) based on due technical cause. Exemptions shall, under no circumstance, be issued in retrospect as a means to alleviate against a breach of a requirement.

Exemptions will only be granted in extraordinary circumstances

Note: The term "exemptions" also includes exceptions.

2 Petitions for Exemptions

2.1 The following policy applies;

(a) Any interested person may petition the Undersecretary of BCAA to issue, amend or delete any regulation or technical standard.

(b) Any person affected by any regulation who feels he has just cause for relief, may petition the Undersecretary of BCAA for temporary exemption.

(c) Each petition filed under this section must:

(i) Be submitted at least 60 days before the proposed effective date of the regulation.

(ii) Include the text or substance of the regulation from which the exemption is sought, or specify the regulation that the petitioner seeks to have deleted.

(iii) Explain the interests of the petitioner in the action requested and in the case of an exemption, include the nature and extent of the relief sought, a description of each aircraft or persons to be covered by the exemption and:

(iv) Contain any information, views, or arguments available to the petitioner to support the action sought, the reasons why granting of the request would be in the public interest and, if appropriate, in the case of an exemption, the reason why the exemption would not adversely affect safety, or the action to be taken by the petitioner to provide a level of safety equal to that provided by the regulation from which the exemption is sought. Such a petition shall be supported by an appropriate, robust and documented safety risk assessment or safety case that shall include any imposition of limitations, conditions or mitigation measures, as appropriate.

3 Requirements for Application

3.1 General

(a) Applications for an exemption should be submitted at least 60 days in advance of the proposed effective date, to obtain timely review.

(b) The request must contain the applicant's:

(i) Name and address;

(ii) Details of any relevant authorization,

(iii) A citation of the specific requirement from which the applicant seeks relief;

(iv) Description of the type of operations to be conducted under the proposed exemption;

(v) The proposed duration of the exemption;

(vi) Explain the interests of the applicant in the exemption requested, including the nature and extent of the exemption requested and a description of each person or thing to be covered by the exemption;

(vii) An explanation of how the exemption would be in the public interest, that is, benefit the public as a whole;

(viii) A detailed description of the alternative means by which the applicant shall ensure a level of safety equivalent to that established by the Regulation in question;

(ix) A review and discussion of any known safety concerns with the requirement, including information about any relevant accidents or incidents of which the applicant is aware;

(x) A safety risk assessment to justify the application of the exemption as well as the continuing need for the exemption;

(xi) If the applicant seeks to operate under the proposed exemption outside of the kingdom of Bahrain airspace, the application shall also indicate whether the exemption would contravene any provision of the Standards and Recommended Practices of the International Civil Aviation Organisation (ICAO).

(c) Unless BCAA agrees otherwise, an application for an exemption shall be submitted no less than sixty days in advance of the proposed effective date of the exemption.

(d) Where an applicant seeks urgent processing, the application must contain supporting facts and reasons why the application was not filed in a timely manner and the reasons it is an urgent application may be rejected if BCAA finds that the applicant has not justified the failure to apply in a timely manner.

(e) If the applicant is not a citizen or legal resident of the Kingdom of Bahrain, the application must specify a Bahraini agent for service.

3.2 Action on Petitions for Rule Making or Exemptions

(a) Except for the written notice of proposed rule-making and comment procedures provided in this section, no public hearing, argument, or other formal proceeding will be conducted.

(b) Except in cases of urgency, written notice of proposed rule-making will be distributed to affected aviation interests. A period of 30 days will normally be allowed for interested persons to submit comments to BCAA.

(c) Comments concerning proposed rule-making must be submitted in a form acceptable to BCAA.

(d) BCAA will consider all comments pertinent to proposed rule-making when they are submitted in the prescribed manner and within the established time limits.

(e) Exemptions may be granted by BCAA if it determines after a technical evaluation that a petition is in the public interest and it provides a level of safety equivalent to that established by the regulation, the exemption will be in the form of a letter and will include:

(i) Name of petitioner.

(ii) A citation of each rule from which relief is requested.

(iii) A brief description of the general nature of the relief granted.

(iv) Disposition of the petition.

Note: All exemptions must be controlled.

(f) If BCAA determines that a petition for an exemption cannot be justified, he will provide the petitioner with written notification of that decision.

(g) The applicant shall regularly review any exemptions/variations with a view to removing the need for such exemptions, where possible, as well as check the validity and robustness of any mitigating measures in place.

4 Review, Publication, and Issue or Denial of the Exemption

4.1 Initial Review by the Authority

(a) BCAA will review the application for accuracy and compliance with the requirements of paragraph 3 above.

(b) If the application appears on its face to satisfy the provisions of paragraph 3 and BCAA determines that a review of its merits is justified, BCAA will publish a detailed summary of the application for comment and specify the date by which comments must be received by BCAA for consideration.

(c) If the filing requirements of paragraph 3 have not been met, BCAA will notify the applicant and take no further action until the applicant complies with the requirements of paragraph 3 above.

4.2 Evaluation of the Request

(a) After initial review, if the filing requirements have been satisfied, BCAA shall conduct an evaluation of the request to include:

(i) A determination of whether an exemption would be in the public interest;

(ii) A determination, after a technical evaluation, of whether the applicant's proposal would providea level of safety equivalent to that established by the Regulation:

(1) A safety risk assessment or safety case shall be developed by the applicant to demonstrate whether an equivalent level of safety or an alternative acceptable means of compliance can be achieved.

(2) BCAA shall carry out a technical evaluation of the application for grant of exemption and review the applicant's risk assessment or safety case for acceptance. The exemption, if granted, shall contain conditions/limitations for the person/organisation to follow while operating under the exemption. In all cases, before granting exemption, it shall be ascertained that an equivalent level of safety is maintained.

(3) If it appears to BCAA that a technical evaluation of the request would impose a significant burden on BCAA technical resources, BCAA may deny the exemption on that basis.

(4) The issuance of an exemption which is not supported by a safety risk assessment or safety case and by a thorough review by BCAA is not acceptable.

(iii) A determination, if the applicant seeks to operate under the exemption outside of the Bahrain FIR, of whether a grant of the exemption would contravene the applicable ICAO Standards and Recommended Practices, and, if so, ensure that ICAO is notified of the differences.

(iv) An evaluation of comments received from interested parties concerning the proposed exemption.

(v) A recommendation, based on the preceding elements, of whether the request should be granted or denied, and of any conditions or limitations that shall be part of the exemption.

4.3 Notification of Determination

(a) BCAA shall notify the applicant by letter and publish a detailed summary of its evaluation and decision to grant the request. The summary shall specify the duration of the exemption and any conditions or limitations to the exemption.

(b) If the request is for urgent relief, BCAA will publish the application and/or BCAA's decision as soon as possible after processing the application.

(c) All cases involving the granting of exemptions shall be fully documented and recorded and all exemptions shall be published on BCAA website, www.mtt.gov.bh and/or in the AIP. The publication shall include the following particulars in respect of the exemption granted:

(i) the reference number of the application;

(ii) the full name of the applicant;

(iii) a reference to the requirement for which exemption is granted;

(iv) references to relevant limitations, conditions or mitigation measures; and

(v) the expiry date of the exemption.

After the expiry of the period of exemption, all notifications shall be removed.

4.4 Extension of the Exemption to other Interested Parties

(a) If BCAA determines that an exemption should be granted, other persons or organizations may apply to BCAA to be included in the relief granted.

(b) Such applications shall be in accordance with the requirements of paragraph 3.

(c) If BCAA determines that the request merits extension of the exemption to the applicant, it shall notify the applicant by letter, specifying the duration of the exemption, and listing any additional conditions that may pertain to the applicant that are not addressed in the underlying exemption.

4.5 Validity of Exemption

(a) An exemption granted shall cease -

(1) at the end of the date specified in the instrument of exemption; or

(2) if no date is specified for that purpose in the instrument, one year after the commencement of the exemption.

(b) An exemption granted to an applicant shall be in the name of that applicant and shall be non-transferable.

AMC OPS 3.035
Quality System
See ANTR OPS 3.035

1 Introduction

1.1 In order to show compliance with ANTR OPS 3.035, the operator should establish his Quality System in accordance with the instructions and information contained in the succeeding paragraphs.

2 General

2.1 Terminology

a. The terms used in the context of the requirement for the operator's Quality System have the following meanings:

i. Accountable Manager. The person acceptable to the BCAA who has corporate authority for ensuring that all operations and maintenance activities can be financed and carried out to the standard required by the BCAA, and any additional requirements defined by the operator.

ii. Quality Assurance. All those planned and systematic actions necessary to provide adequate confidence that operational and maintenance practices satisfy given requirements.

iii. Quality Manager. The manager, acceptable to the BCAA, responsible for the management of the Quality System, monitoring function and requesting remedial actions.

2.2 Quality Policy

2.2.1 The operator should establish a formal written Quality Policy Statement that is a commitment by the Accountable Manager as to what the Quality System is intended to achieve. The Quality Policy should reflect the achievement and continued compliance with ANTR OPS 3 together with any additional standards specified by the operator.

2.2.2 The Accountable Manager is an essential part of the management organisation. With regard to the text in ANTR OPS 3.175(h) and the above terminology, the term 'Accountable Manager' is intended to mean the Chief Executive/President/Managing Director/Director General/General Manager etc. of the operator's organisation, who by virtue of his position has overall responsibility (including financial) for managing the organisation.

2.2.3 The position of the Accountable Manager in the organisation should be such that at least the Nominated Postholders for Operations and Maintenance and the Quality Manager have direct access to him.

2.2.4 The Accountable Manager will have overall responsibility for the Quality System including the frequency, format and structure of the internal management evaluation activities as prescribed in paragraph 4.9 below.

2.3 Purpose of the Quality System

2.3.1 The Quality System should enable the operator to monitor compliance with ANTR OPS 3, the Operations Manual, maintenance management exposition, and any other standards specified by that operator, or the BCAA, to ensure safe operations and airworthy aircraft.

2.4 Quality Manager

2.4.1 The function of the Quality Manager to monitor compliance with, and the adequacy of, procedures required to ensure safe operational practices and airworthy helicopters, as required by ANTR OPS 3.035(a), may be carried out by more than one person by means of different, but complementary, Quality Assurance Programmes.

2.4.2 The primary role of the Quality Manager is to verify, by monitoring activity in the fields of flight operations, maintenance, crew training and ground operations, that the standards required by the BCAA, and any additional requirements defined by the operator, are being carried out under the supervision of the relevant Nominated Postholder.

2.4.3 The Quality Manager should be responsible for ensuring that the Quality Assurance Programme is properly established, implemented and maintained.

2.4.4 The Quality Manager should:

a. Have direct access to the Accountable Manager;

b. Have access to all parts of the operator’s organisation.

2.4.5 In the case of small/very small operators (see paragraph 7.3 below), the posts of the Accountable Manager and the Quality Manager may be combined. However, in this event, quality audits should be conducted by independent personnel. In accordance with paragraph 2.4.4.b above, it will not be possible for the Accountable Manager to be one of the nominated postholders.

3 Quality System

3.1 Introduction

3.1.1 The operator’s Quality System should ensure compliance with and adequacy of operational and maintenance activities requirements, standards and procedures.

3.1.2 The operator should specify the basic structure of the Quality System applicable to the operation.

3.1.3 The Quality System should be structured according to the size and complexity of the operation to be monitored (‘small operators’ see also paragraph 7 below).

3.2 Scope

3.2.1 As a minimum, the Quality System should address the following:

a. The provisions of OPS;

b. The operator’s additional standards and operating procedures;

c. The operator’s Quality Policy;

d. The operator’s organisational structure;

e. Responsibility for the development, establishment and management of the Quality System;

f. Documentation, including manuals, reports and records;

g. Quality Procedures;

h. Quality Assurance Programme;

i. The required financial, material, and human resources; and

j. Training requirements.

3.2.2 The quality system should include a feedback system to the Accountable Manager to ensure that corrective actions are both identified and promptly addressed. The feedback system should also specify who is required to rectify discrepancies and non-compliance in each particular case, and the procedure to be followed if remedial action is not completed within an appropriate timescale.

3.3 Relevant Documentation

3.3.1 Relevant documentation includes the relevant part(s) of the Operations Manual and the Operator’s Maintenance Management Exposition, which may be included in a separate Quality Manual.

3.3.2 In addition, relevant documentation should also include the following:

a. Quality Policy;

b. Terminology;

c. Specified operational standards;

d. A description of the organisation;

e. The allocation of duties and responsibilities;

f. Procedures to ensure regulatory compliance;

g. The Quality Assurance Programme, reflecting;

i. Schedule of the monitoring process;

ii. Audit procedures;

iii. Reporting procedures;

iv. Follow-up and remedial action procedures;

v. Recording system;

h. The training syllabus; and

i. Document control.

4 Quality Assurance Programme (See ANTR OPS 3.035(b).)

4.1 Introduction

4.1.1 The Quality Assurance Programme should include all planned and systematic actions necessary to provide confidence that all operations and maintenance are conducted in accordance with all applicable requirements, standards and procedures.

4.1.2 When establishing a Quality Assurance Programme, consideration should, at least, be given to the paragraphs 4.2 to 4.9 below:

4.2 Quality Inspection

4.2.1 The primary purpose of a quality inspection is to observe a particular event/action/document etc., in order to verify whether established procedures and requirements are followed during the accomplishment of that event and whether the required standard is achieved.

4.2.2 Typical subject areas for quality inspections are:

a. Actual flight operation;

b. Ground De/Anti-icing, if appropriate;

c. Flight Support Services;

d. Load Control;

e. Maintenance;

f. Technical Standards; and

g. Training Standards.

4.3 Audit

4.3.1 An audit is a systematic, and independent comparison of the way in which an operation is being conducted against the way in which the published procedures say it should be conducted.

4.3.2 Audits should include at least the following procedures and processes:

a. A statement explaining the scope of the audit;

b. Planning and preparation;

c. Gathering and recording evidence; and

d. Analysis of the evidence.

4.3.3 Techniques which contribute to an effective audit are:

a. Interviews or discussions with personnel;

b. A review of published documents;

c. The examination of an adequate sample of records;

d. The witnessing of the activities which make up the operation; and

e. The preservation of documents and the recording of observations.

4.4 Auditors

4.4.1 The operator should decide, depending on the complexity of the operation, whether to make use of a dedicated audit team or a single auditor. In any event, the auditor or audit team should have relevant operational and/or maintenance experience.

4.4.2 The responsibilities of the auditors should be clearly defined in the relevant documentation.

4.5 Auditor's Independence

4.5.1 Auditors should not have any day-to-day involvement in the area of the operation and/or maintenance activity which is to be audited. The operator may, in addition to using the services of full-time dedicated personnel belonging to a separate quality department, undertake the monitoring of specific areas or activities by the use of part-time auditors. The operator whose structure and size does not justify the establishment of full-time auditors, may undertake the audit function by the use of part-time personnel from within his own organisation or from an external source under the terms of an agreement acceptable to the BCAA. In all cases the operator should develop suitable procedures to ensure that persons directly responsible for the activities to be audited are not selected as part of the auditing team. Where external auditors are used, it is essential that any external specialist is familiar with the type of operation and/or maintenance conducted by the operator.

4.5.2 The operator's Quality Assurance Programme should identify the persons within the company who have the experience, responsibility and authority to:

a. Perform quality inspections and audits as part of ongoing Quality Assurance;

b. Identify and record any concerns or findings, and the evidence necessary to substantiate such concerns or findings;

c. Initiate or recommend solutions to concerns or findings through designated reporting channels;

d. Verify the implementation of solutions within specific timescales;

e. Report directly to the Quality Manager.

4.6 Audit Scope

4.6.1 Operators are required to monitor compliance with the procedures they have designed to ensure safe operations, airworthy aircraft and the serviceability of both operational and safety equipment. In doing so they should as a minimum, and where appropriate, monitor:

a. Organisation;

b. Plans and Company objectives;

c. Operational Procedures;

d. Flight Safety;

e. Operator certification (AOC/Operations specification);

f. Supervision;

g. Helicopter Performance;

h. All Weather Operations;

i. Communications and Navigational Equipment and Practices;

j. Mass, Balance and Helicopter Loading;

k. Instruments and Safety Equipment;

l. Manuals, Logs, and Records;

m. Flight and Duty Time Limitations, Rest Requirements, and Scheduling;

n. Helicopter Maintenance/Operations interface;

o. Use of the MEL;

p. Maintenance Programmes and Continued Airworthiness;

q. Airworthiness Directives management;

r. Maintenance Accomplishment;

s. Defect Deferral;

t. Flight Crew;

u. Cabin Crew, if appropriate;

v. Dangerous Goods;

w. Security; and

x. Training.

4.7 Audit Scheduling

4.7.1 A Quality Assurance Programme should include a defined audit schedule and a periodic review cycle area by area. The schedule should be flexible, and allow unscheduled audits when trends are identified. Follow-up audits should be scheduled when necessary to verify that corrective action was carried out and that it was effective.

4.7.2 The operator should establish a schedule of audits to be completed during a specified calendar period. All aspects of the operation should be reviewed within every period of 12 months in accordance with the programme unless an extension to the audit period is accepted as explained below. The operator may increase the frequency of audits at his discretion but should not decrease the frequency without the agreement of the BCAA. It is considered unlikely that a frequency of greater than 24 months would be acceptable for any audit topic.

4.7.3 When the operator defines the audit schedule, significant changes to the management, organisation, operation, or technologies should be considered as well as changes to the regulatory requirements.

4.8 Monitoring and Corrective Action

4.8.1 The aim of monitoring within the Quality System is primarily to investigate and judge its effectiveness and thereby to ensure that defined policy, operational, and maintenance standards are continuously complied with. Monitoring activity is based upon quality inspections, audits, corrective action and follow- up. The operator should establish and publish a procedure to monitor regulatory compliance on a continuing basis. This monitoring activity should be aimed at eliminating the causes of unsatisfactory performance.

4.8.2 Any non-compliance identified as a result of monitoring should be communicated to the manager responsible for taking corrective action or, if appropriate, the Accountable Manager. Such non - compliance should be recorded, for the purpose of further investigation, in order to determine the cause and to enable the recommendation of appropriate corrective action.

4.8.3 The Quality Assurance Programme should include procedures to ensure that corrective actions are taken in response to findings. These procedures should monitor such actions to verify their effectiveness and that they have been completed. Organisational responsibility and accountability for the implementation of corrective action resides with the department cited in the report identifying the finding. The Accountable Manager will have the ultimate responsibility for resourcing the corrective action and ensuring, through the Quality Manager, that the corrective action has re-established compliance withthe standard required by the BCAA, and any additional requirements defined by the operator.

4.8.4 Corrective action

a. Subsequent to the quality inspection/audit, the operator should establish:

i. The seriousness of any findings and any need for immediate corrective action;

ii. The origin of the finding;

iii. What corrective actions are required to ensure that the non-compliance does not recur;

iv. A schedule for corrective action;

v. The identification of individuals or departments responsible for implementing corrective action; and

vi. Allocation of resources by the Accountable Manager, where appropriate.

4.8.5 The Quality Manager should:

a. Verify that corrective action is taken by the manager responsible in response to any finding(s) of non - compliance;

b. Verify that corrective action includes the elements outlined in paragraph 4.8.4 above;

c. Monitor the implementation and completion of corrective action;

d. Provide management with an independent assessment of corrective action, implementation and completion;

e. Evaluate the effectiveness of corrective action through the follow-up process.

4.9 Management Evaluation

4.9.1 A management evaluation is a comprehensive, systematic, documented review of operational policies, procedures, and systems and should consider:

a. The results of inspections, audits and any other indicators; and

b. The overall effectiveness of the management organisation in achieving stated objectives.

4.9.2 A management evaluation should identify and correct trends, and prevent, where possible, future non - conformities. Conclusions and recommendations made as a result of an evaluation should be submittedin writing to the responsible manager for action. The responsible manager should be an individual who has the BCAA to resolve issues and take action.

4.9.3 The Accountable Manager should decide upon the frequency, format, and structure of internal management evaluation activities.

4.10 Recording

4.10.1 Accurate, complete, and readily accessible records documenting the results of the Quality Assurance Programme should be maintained by the operator. Records are essential data to enable the operator to analyse and determine the root causes of non-conformity, so that areas of non-compliance can beidentified and addressed.

4.10.2 The following records should be retained for a period of 5 years:

a. Audit Schedules;

b. Inspection and Audit reports;

c. Responses to findings;

d. Corrective action reports;

e. Follow-up and closure reports; and

f. Management Evaluation reports.

5 Quality Assurance Responsibility for Sub-Contractors

5.1 Sub-Contractors

5.1.1 Operators may decide to sub-contract out certain activities to external agencies for the provision of services related to areas such as:

a. Ground De-icing/Anti-icing;

b. Maintenance;

c. Ground handling;

d. Flight Support (including Performance calculations, flight planning, navigation database and despatch);

e. Training; and

f. Manual preparation.

5.1.2 The ultimate responsibility for the quality of the product or service always remains with the operator. A written agreement should exist between the operator and the sub-contractor clearly defining the services and quality to be provided. The sub-contractor's activities relevant to the agreement should be included in the operator's Quality Assurance Programme.

5.1.3 The operator should ensure that the sub-contractor has the necessary authorisation/approval when required, and commands the resources and competence to undertake the task. If the operator requires the sub-contractor to conduct activity which exceeds the sub-contractor's authorisation/approval, the operator is responsible for ensuring that the sub-contractor's quality assurance takes account of such additional requirements.

6 Quality System Training

6.1 General

6.1.1 The operator should establish effective, well planned and resourced quality related training for all personnel.

6.1.2 Those responsible for managing the Quality System should receive training covering:

a. An introduction to the concept of the Quality System;

b. Quality management;

c. The Concept of Quality Assurance;

d. Quality manuals;

e. Audit techniques;

f. Reporting and recording; and

g. The way in which the Quality System will function in the company.

6.1.3 Time should be provided to train every individual involved in quality management and for briefing the remainder of the employees. The allocation of time and resources should be governed by the size and complexity of the operation concerned.

6.2 Sources of Training

6.2.1 Quality management courses are available from the various National or International Standards Institutions, and the operator should consider whether to offer such courses to those likely to be involved in the management of Quality Systems. Operators with sufficient appropriately qualified st aff should consider whether to carry out in-house training.

7 Organisations with 20 or less full time employees

7.1 Introduction

The requirement to establish and document a Quality System, and to employ a Quality Manager appliesto all operators. References to large and small operators elsewhere in the requirements are governed by aircraft capacity (i.e. more or less than 10 seats) and by mass (greater or less than 3 175 kg maximum certificated take-off mass (MCTOM)). Such terminology is not relevant when considering the scale of an operation and the Quality System required. In the context of quality systems therefore, operators should be categorised according to the number of full time staff employees.

7.2 Scale of Operation

7.2.1 Operators who employ 5 or less full time staff are considered to be ‘very small’ while those employing between 6 and 20 full time employees are regarded as ‘small’ operators as far as quality systems are concerned. Full-time in this context means employed for not less than 35 hours per week excluding vacation periods.

7.2.2 Complex quality systems could be inappropriate for small or very small operators and the clerical effort required to draw up manuals and procedures for a complex system may stretch their resources. It is therefore accepted that such operators should tailor their quality systems to suit the size and complexityof their operation and allocate resources accordingly.

7.3 Quality Systems for small/very small Operators

7.3.1 For the ‘very small’ operator it may be appropriate to develop a Quality Assurance Programme that employs a checklist. The checklist should have a supporting schedule that requires completion of all checklist items within a specified timescale, together with a statement acknowledging completion of a periodic review by top management. An occasional independent overview of the checklist content and achievement of the Quality Assurance should be undertaken.

7.3.2 The ‘small’ operator may decide to employ an internal or external system or a combinati on of the two. In these circumstances it would be acceptable for external specialists and or qualified organisations to manage the quality system on behalf of the Quality Manager.

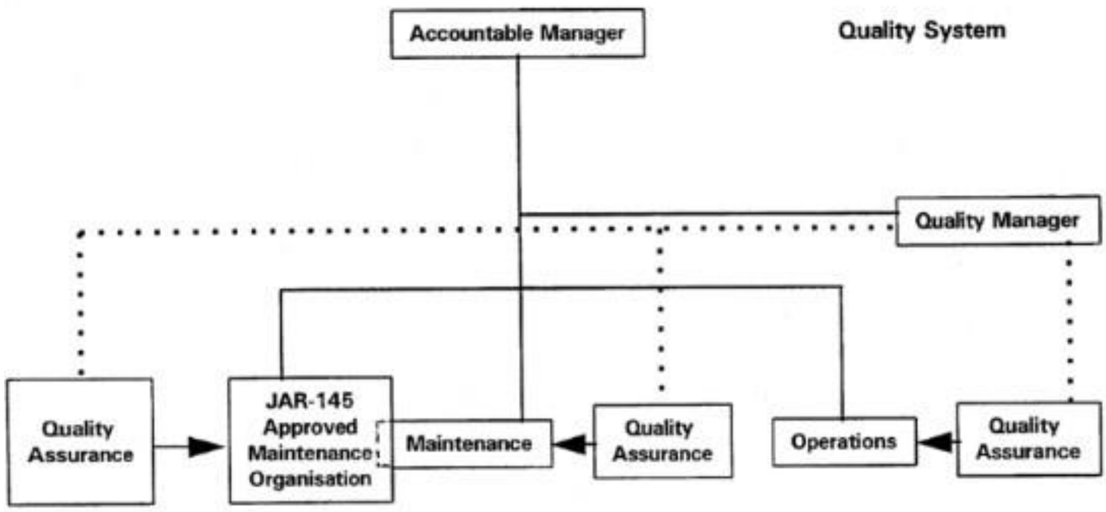
7.3.3 If the independent quality monitoring function is being conducted by an organisation other than the one carrying out the operations, it is necessary for the audit schedule to be shown in the relevant documentation.

7.3.4 Whatever arrangements are made, the operator retains the ultimate responsibility for quality activities and corrective actions.

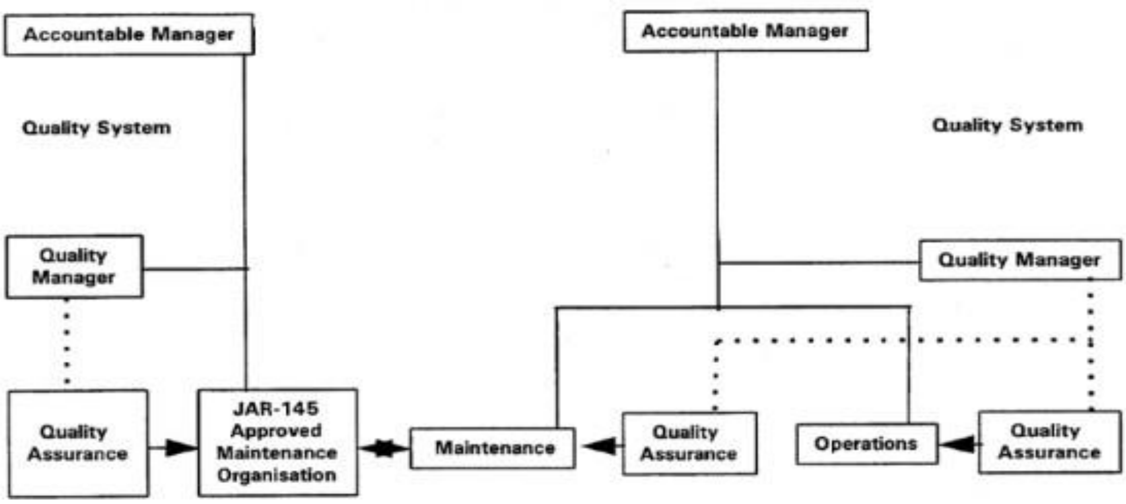
IEM OPS 3.035
Quality System - Organisation examples
See ANTR OPS 3.035

The following diagrams illustrate two typical examples of Quality organisations.

1 Quality System within an organisation when the organisation also holds a ANTR 145 approval.



2 Quality Systems related to an organisation where aircraft maintenance is contracted out to an approved organisation which is not integrated with the AOC holder:



Note: The Quality System and Quality Audit Programme of the AOC/Authorisation holder should assure that the maintenance carried out by the approved organisation is in accordance with requirements specifiedby the AOC/Authorisation holder.

IEM OPS 3.037
Safety Management System
See ANTR OPS 3.037

1 Guidance material for the establishment of a Safety Management System can be found in:

a. ICAO Doc 9422 (Accident Prevention Manual); and

b. ICAO Doc 9376 (Preparation of an Operational Manual).

c. ICAO Doc, 9859 (Safety Management Manual)

2 Where available, use may be made of analysis of flight data recorder information (See also ANTR OPS 3.160(c).)

AC OPS 3.037(c)
Occurrence Reporting Scheme
See ANTR OPS 3.037(c)

1. The overall objective of the scheme described in ANTR OPS 3.037(c) is to use reported information to improve the level of flight safety and not to attribute blame.

2. The detailed objectives of the scheme are:

a. To enable an assessment of the safety implications of each relevant incident and accident to be made, including previous similar occurrences, so that any necessary action can be initiated; and

b. To ensure that knowledge of relevant incidents and accidents is disseminated so that other persons and organisations may learn from them.

3. The scheme is an essential part of the overall monitoring function; it is complementary to the normalday to day procedures and 'control' systems and is not intended to duplicate or supersede any of them. The scheme is a tool to identify those occasions where routine procedures have f ailed. (Occurrences that have to be reported and responsibilities for submitting reports are described in ANTR OPS 3.420.)

4. Occurrences should remain in the database when judged reportable by the person submitting the report as the significance of such reports may only become obvious at a later date.

AC OPS 3.037(d)
Flight Data Monitoring Programme
See ANTR OPS 3.037(d)

1. Flight Data Monitoring (FDM) is the pro-active and non-punitive use of digital flight data from routine operations to improve aviation safety.

2. The manager of the safety management system, which includes the FDM programme, is accountable for the discovery of issues and the transmission of these to the relevant manager(s) responsible for the process(es) concerned. The latter are accountable for taking appropriate and practicable safety action within a reasonable period of time that reflects the severity of the issue.

Note: While the operator may contract the operation of a flight data analysis programme to another party the overall responsibility remains with the operator's safety management system manager.

3. An FDM programme will allow the operator to:

3.1 Identify areas of operational risk and quantify current safety margins.

3.2 Identify and quantify operational risks by highlighting when non-standard, unusual or unsafe circumstances occur.

3.3 Use the FDM information on the frequency of occurrence, combined with an estimation of the level of severity, to assess the safety risks and to determine which may become unacceptable if the discovered trend continues.

3.4 Put in place appropriate procedures for remedial action once an unacceptable risk, either actually present or predicted by trending, has been identified.

3.5 Confirm the effectiveness of any remedial action by continued monitoring.

4. Flight Data Monitoring Analysis Techniques:

4.1 Exceedence Detection: This looks for deviations from flight manual lim its, and standard operating procedures. A set of core events should be selected to cover the main areas of interest to the operator. A sample list is in the Appendix. The event detection limits should be continuously reviewed to reflect the operator's current operating procedures.

4.2 All Flights Measurement: A system that defines what is normal practice. This may be accomplished by retaining various snapshots of information from each flight.

4.3 Statistics: A series of measures collected to support the analysis process. These would be expected to include the numbers of flights flown and analysed, aircraft and sector details sufficient to generate rate and trend information.

5. Flight Data Monitoring Analysis, Assessment and Process Control Tools: The effective assessment of information obtained from digital flight data is dependent on the provision of appropriate information technology tool sets. A programme suite may include: Annotated data trace displays, engineering unit listings, visualisation for the most significant incidents, access to interpretative material, links to other safety information, and statistical presentations.

6. Education and Publication: Sharing safety information is a fundamental principle of aviation safety in helping to reduce accident rates The operator should pass on the lessons learnt to all relevant personnel and, where appropriate, industry. Similar media to air safety systems may be used. These may include: Newsletters, flight safety magazines, highlighting examples in training and simulator exercises, periodic reports to industry and the regulatory authority.

7. Accident and incident data requirements specified in ANTR OPS 3.160 take precedence over the requirements of an FDM programme. In these cases the FDR data should be retained as part of the investigation data and may fall outside the de-identification agreements.

8. Every crew member has a responsibility to report events described in ANTR OPS 3.085(b) using the company occurrence reporting scheme detailed in ANTR OPS 3.037(c). Mandatory Occurrence

Reporting is a requirement under ANTR OPS 3.420. Significant risk-bearing incidents detected by FDM will therefore normally be the subject of mandatory occurrence reporting by the crew. If this is not the case then they should submit a retrospective report that will be included under the normal safety management system process without prejudice.

9. The data recovery strategy should ensure a sufficiently representative capture of flight information to maintain an overview of operations. Data analysis should be performed sufficiently frequently to enable action to be taken on significant safety issues.

10. The data retention strategy should aim to provide the greatest safety benefits practicable from the available data. A full data set should be retained until the action and review processes are complete; thereafter, a reduced data set relating to closed issues can be maintained for longer term trend analysis. Programme managers may wish to retain samples of de-identified full-flight data for various safety purposes (detailed analysis, training, benchmarking etc.).

11. Data Access and Security policy should restrict information access to authorised persons. When data access is required for airworthiness and maintenance purposes, a procedure should be in place to prevent disclosure of crew identity.

12. Procedure Document; this document signed by all parties (airline management, flight crew member representatives nominated either by the union or the flight crew themselves) will, as a minimum, define:

a) The aim of the FDM programme.

b) A data access and security policy that should restrict access to information to specifically authorised persons identified by their position.

c) The method to obtain de-identified crew feedback on those occasions that require specific flight follow-up for contextual information; where such crew contact is required the authorised person(s) need not necessarily be the programme manager, or safety manager, but could be a third party (broker) mutually acceptable to unions or staff and management.

d) The data retention policy and accountability including the measures taken to ensure the security of the data.

e) The conditions under which, on rare occasions, advisory briefing or remedial training should take place; this should always be carried out in a constructive and non-punitive manner.

f) The conditions under which the confidentiality may be withdrawn for reasons of gross negligence or significant continuing safety concern.

g) The participation of flight crew member representative(s) in the assessment of the data, the action and review process and the consideration of recommendations.

h) The policy for publishing the findings resulting from FDM.

13. Airborne systems and equipment used to obtain FDM data will range from an already installed full Quick Access Recorder, in a modern aircraft with digital systems, to a basic crash protected recorder in an older or less sophisticated aircraft. The analysis potential of the reduced data set available in the latter case may reduce the safety benefits obtainable. The operator shall ensure that FDM use does not adversely affect the serviceability of equipment required for accident investigation.

AC OPS 3.037 (i)
Safety Risk Register
See ANTR OPS 3.037(i)

Hazard		Incident Sequence Description	Existing Controls	Outcome Pre-Mitigation			Additional Mitigation required	Outcome Post Mitigation			Actions and Owners	Monitoring and Review Requirements
No.	Description			Severity	Likelihood	Risk		Severity	Likelihood	Risk		

IEM OPS 3.065
Carriage of weapons of war and munitions of war
See ANTR OPS 3.065

1 There is no internationally agreed definition of weapons of war and munitions of war. Some States may have defined them for their particular purposes or for national need.

2 It should be the responsibility of the operator to check, with the State(s) concerned, whether or not a particular weapon or munition is regarded as a weapon of war or munition of war. In this context, States which may be concerned with granting approvals for the carriage of weapons of war or munitions of warare those of origin, transit, overflight and destination of the consignment and the State of the operator.

3 Where weapons of war or munitions of war are also dangerous goods by definition (e.g. torpedoes, bombs, etc.), Subpart R will also apply.

(See also IEM OPS 3.070)

IEM OPS 3.070
Carriage of sporting weapons
See ANTR OPS 3.070

1 There is no internationally agreed definition of sporting weapons. In general they may be any weapon which is not a weapon of war or munition of war (See IEM OPS 3.065). Sporting weapons include hunting knives, bows and other similar articles. An antique weapon, which at one time may have been a weapon of war or munition of war, such as a musket, may now be regarded as a sporting weapon.

2 A firearm is any gun, rifle or pistol which fires a projectile.

3 In the absence of a specific definition, for the purpose of OPS and in order to provide some guidance to operators, the following firearms are generally regarded as being sporting weapons:

a. Those designed for shooting game, birds and other animals;

b. Those used for target shooting, clay-pigeon shooting and competition shooting, providing the weapons are not those on standard issue to military forces;

c. Airguns, dart guns, starting pistols, etc.

4 A firearm, which is not a weapon of war or munition of war, should be treated as a sporting weapon for the purposes of its carriage on a helicopter.

5 Other procedures for the carriage of sporting weapons may need to be considered if the helicopter does not have a separate compartment in which the weapons can be stowed.

These procedures should take into account the nature of the flight, its origin and destination, and the possibility of unlawful interference. As far as possible, the weapons should be stowed so they are not immediately accessible to the passengers (e.g. in locked boxes, in checked baggage which is stowed under other baggage or under fixed netting). If procedures other than those in ANTR OPS 3.070(b)(1) are applied, the commander should be notified accordingly.

AMC OPS 3.110
Portable Electronic Devices
(See ANTR OPS 3.110 and IEM OPS 3.110)

1. GENERAL

(a) Scope

This AMC provides means to prevent portable electronic devices (PEDs) on board aircraft adversely affect the performance of the aircraft's systems and equipment. It addresses operation of PEDs in the different aircraft zones – passenger compartment, flight compartment, and cargo compartments. Furthermore, it addresses the specific case of PEDs qualified and under configuration control by the operator - controlled PEDs (C-PEDs) - for which the operator gives some credit.

(b) Restrictions on the use of PEDs in the passenger compartment

If the operator permits passengers to use PEDs on board its aircraft, procedures should be in place to control their use. The operator should ensure that all crew members and ground personnel are trained to enforce the restrictions on this equipment in line with these procedures.

These procedures should ensure the following:

(1) As the general principle all PEDs (including transmitting PEDs (T-PEDs)) are switched- off at the start of the flight when the passengers have boarded and all doors have been closed, until a passenger door has been opened at the end of the flight.

(2) The following exceptions from the above general principle may be granted under the responsibility of the operator:

(i) Medical equipment necessary to support physiological functions does not need to be switched-off.

(ii) The use of PEDs, excluding T-PEDs, may be permitted during all phases of flight.

(iii) T-PEDs may be used during non-critical phases of flight, excluding taxiing, if the aircraft is equipped with a system or otherwise certified allowing the operation of such technology during flight. The restrictions coming from the corresponding aircraft certification as documented in the aircraft flight manual (AFM), or equivalent document(s), stay in force.

(iv) Use of cellphone may be permitted after an aircraft has left active runway after landing.

(v) The use of C-PEDs during critical phases of flight, however, may only be permitted if the operator has accounted for this situation in its assessment.

(vi) The commander may permit the use of any kind of PED when the aircraft is stationary during prolonged departure delays, provided that sufficient time is available to check the passenger compartment before the flight proceeds. Similarly, after landing, the commander may authorize the use of any kind of PED in the event of a prolonged delay for a parking/gate position (even though doors are closed and the engines are running).

(3) Announcements should be made during boarding of the aircraft to inform passengers of the restrictions applicable to PEDs (in particular to T-PEDs) before fastening their seat belts.

(4) Where in-seat electrical power supplies are available for passenger use the following should apply:

(i) Information cards giving safety instructions are provided to the passengers;

(ii) PEDs should be disconnected from any in seat electrical power supply, during taxiing, take-off, approach, landing, and during abnormal or emergency conditions; and

(iii) Flight crew and cabin crew should be aware of the proper means to switch- off in-seat power supplies used for PEDs.

(5) During boarding and any phase of flight:

(i) Appropriate coordination between flight crew and cabin crew is defined to deal with interference or other safety problems associated with PEDs;

(ii) Passenger use of equipment during the flight is monitored;

(iii) Suspect equipment is switched off; and

(iv) Particular attention is given to passenger misuse of equipment that could include a built-in transmitting function.

(6) Thermal runaways of batteries, in particular lithium batteries, and potential resulting fire can be handled properly.

(7) Appropriate coordination between flight crew and cabin crew should be defined to deal with interference or other safety problems associated with PEDs.

(8) The commander may for any reason and during any phase of flight require deactivation and stowage of PEDs.

(9) Occurrences of suspected or confirmed interference that have potential safety implications should be reported to the competent authority. Where possible, to assist follow-up and technical investigation, reports should describe the offending device, identify the brand name and model number, its location in the aircraft at the time of the occurrence, interference symptoms and the results of actions taken by the crew.

The cooperation of the device owner should be sought by obtaining contact details.

(10) Special requests to operate a PED or T-PED during any phase of the flight for specific reasons (e.g. for security measures) should be handled properly.

(c) Restrictions on the use of PEDs in the flight compartment

Due to the higher risk of interference and potential for distracting crew from their duties, PEDs should not be used in the flight compartment. However, the operator may allow the use of PEDs, e.g. to assist the flight crew in their duties, if procedures are in place to ensure the following:

(1) The conditions for the use of PEDs in-flight are specified in the operations manual, otherwise they should be switched off and stowed during all phases of flight.

(2) The PEDs do not pose a loose-item risk or other hazard.

(3) During critical phases of flight only those C-PEDs are operated, for which the operator has demonstrated that the radio frequency (RF) interference levels are below those considered acceptable for the specific aircraft environment. Guidance for such test is provided in (e) below.

(4) During pre-flight procedures, e.g. when loading route information into navigation systems or when monitoring fuel loading, no T-PED should be operated. In all other cases, flight crew and other persons on board the aircraft involved in dispatching the aircraft should observe the same restrictions as applicable to passengers.

(5) These restrictions should not preclude use of a T-PED (specifically a mobile phone) by the flight crew to deal with an emergency. However, reliance should not be predicated on a T-PED for this purpose.

(d) PEDs not accessible during the flight

PEDs should be switched off, when not accessible for deactivation during flight. This should apply especially to PEDs contained in baggage or transported as part of the cargo. The operator may allow deviation for PEDs for which tests have demonstrated their safe operation. Other precautions, such as transporting in shielded, metal boxes, may also be used to mitigate associated risks.

In case an automated function is used to deactivate a T-PED, the unit should be qualified for safe operation on board the aircraft.

(e) Test methods

The means to demonstrate that the RF radiations (intentional or non-intentional) are tolerated by aircraft systems should be as follows:

(1) The radio frequency (RF) emissions of PEDs should meet the levels as defined by EUROCAE ED- 14E/RTCA DO 160E Section 21 Category M for operation in the passenger compartment and EUROCAE ED-14E/RTCA DO 160E Section 21 Category H for operation in the cargo bay. Later revisions of those documents may be used for testing. The assessment of intentional transmissions of T-PEDs is excluded from those test standards and needs to be addressed separately.

(2) When the operator intends to allow the operation of T-PEDs, its assessment should follow the principles set out in EUROCAE ED-130.

The BCAA reminds the industry to consider the applicable telecommunication regulations before allowing the use of transmitting functions on-board aircraft.

IEM OPS 3.110
Portable Electronic Devices
(See ANTR OPS 3.110 and AMC OPS 3.110)

(a) Definition and categories of PEDs

PEDs are any kind of electronic device, typically but not limited to consumer electronics, brought on board the aircraft by crew members, passengers, or as part of the cargo and that are not included in the approved aircraft configuration. All equipment that is able to consume electrical energy falls under this definition. The electrical energy can be provided from internal sources as batteries (chargeable or non-rechargeable) or the devices may also be connected to specific aircraft power sources.

PEDs fall into three categories:

(1) Non-intentional transmitters can non-intentionally radiate RF transmissions. This category includes, but is not limited to, computing equipment, cameras, radio receivers, audio and video reproducers, electronic games and toys. In addition, portable, non- transmitting devices provided to assist crew members in their duties are included in this category. The category is identified as PED.

(2) Intentional transmitters can radiate RF transmissions on specific frequencies as part of their intended function. In addition, they may radiate non-intentional transmissions like any PED. The term ‘transmitting PED’ (T-PED) is used to identify the transmitting capability of the PED. Intentional transmitters are transmitting devices such as RF based remote control equipment, which may include some toys, two-way radios (sometimes referred to as private mobile radio), mobile phones of any type, satellite phones, computer with mobile phone data connection, wireless fidelity (WIFI) or Bluetooth capability. After deactivation of the transmitting capability, e.g.

by activating the so-called ‘flight mode’ or ‘flight safety mode’, the T-PED remains a PED having non- intentional emissions.

(3) A controlled PED (C-PED) is subject to administrative control by the operator. This will include, inter alia, tracking the location of the devices to specific aircraft or persons and ensuring that no unauthorized changes are made to the hardware, software or databases. A controlled PED will also be subject to procedures to ensure that it is maintained to the latest amendment state. C-PEDs can be assigned to the category of non-intentional transmitters (PEDs) or intentional transmitters (T-PEDs).

(b) Definition of the switched-off status

Many PEDs are not completely disconnected from the internal power source when switched off. The switching function may leave some remaining functionality e.g. data storage, timer, clock, etc. These devices can be considered switched off when in the deactivated status. The same applies for devices having no transmit capability and operated by coin cells without further deactivation capability, e.g. wrist watches.

(c) Fire caused by PEDs

A detailed discussion of fire caused by PEDs can be found in CAA UK CAP 789 edition 2, chapter 31, section 6 Fires in the cabin caused by PEDs2 and CAA PAPER 2003/4, Dealing With In-Flight Lithium Battery Fires in Portable Electronic Devices, M.J. Lain, D.A. Teagle, J. Cullen, V. Dass3.

AC OPS 3.125
Documents to be carried
See ANTR OPS 3.125

In case of loss or theft of documents specified in ANTR OPS 3.125, the operation is allowed to continue until the flight reaches the base or a place where a replacement document can be provided.

AMC OPS 3.130
Manuals to be carried
See ANTR OPS 3.130 (a) (1)

The carriage of an approved electronic version of the Operations Manual is acceptable.

IEM OPS 3.160(a)
Preservation of recordings
See ANTR OPS 3.160(a)

The phrase ‘to the extent possible’ means that either:

1. There may be technical reasons why all of the data cannot be preserved, or

2. The helicopter may have been despatched with unserviceable recording equipment as permitted by ANTR OPS 3.700(f), 3.705(f), 3.715(h), or 3.720(h).

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AC/AMC/IEM C – OPERATOR CERTIFICATION & SUPERVISION

AC OPS 3.175(k)
Nominated Postholders - Competence
See ANTR OPS 3.175(*i*)

1. *General.*

1.1 A nominee for postholder should be able to demonstrate experience and the ability to perform effectively the functions associated with the post and with the scale of the operation; and

1.2 Nominated postholders should have:

1.2.1 Practical experience and expertise in the application of aviation safety standards and safe operating practices;

1.2.2 Comprehensive knowledge of:

a. OPS and any associated requirements and procedures;

b. The AOC holder's Operations Specifications;

c. The need for, and content of, the relevant parts of the AOC/Authorisation holder's Operations Manual;

1.2.3 Familiarity with Quality Systems;

1.2.4 Appropriate management experience.

2. *Flight Operations.* The nominated postholder or his deputy should hold, or have held, a Flight Crew Licence appropriate to the type of operation conducted under the AOC/Authorisation in accordance with the following:

2.1 If the AOC includes helicopters certificated for a minimum crew of 2 pilots - An Airline Transport Pilot's Licence issued or validated by an ICAO State:

2.2 If the AOC is limited to helicopters certificated for a minimum crew of 1 pilot - A Commercial Pilot's Licence issued or validated by an ICAO State.

3. For larger companies or companies with complex structures, postholders should be expected to satisfy the BCAA that they possess the appropriate experience and licensing requirements which are listed in paragraphs 4 to 6 below.

4. *Maintenance System.* The nominated postholder should possess the following:

4.1 Relevant engineering degree, or aircraft maintenance technician with additional education acceptable to the BCAA. ‘Relevant engineering degree’ means an engineering degree from Aeronautical, Mechanical, Electrical, Electronic, Avionic or other studies relevant to the maintenance of aircraft/aircraft components.

4.2 Thorough familiarity with the organisation's Maintenance Management Exposition.

4.3 Knowledge of the relevant type(s) of helicopter;

4.4 Knowledge of maintenance methods.

5. *Crew Training.* The nominated postholder or his deputy should be a current Type Rating Instructor on a type operated under the AOC.

5.1 The nominated postholder should have a thorough knowledge of the AOC holder’s crew training concept for Flight Crew and for Cabin Crew when relevant.

6. *Ground Operations.* The nominated postholder should have a thorough knowledge of the AOC holder’s ground operations concept.

7. *Security.* The nominated postholder should have a thorough knowledge of the National Civil Aviation Security Programme, the operator’s security programme, security training requirements and threat assessment.

AC OPS 3.175(j)
Combination of nominated postholder's responsibilities
See ANTR OPS 3.175(j)

1. The acceptability of a single person holding several posts, possibly in combination with being the accountable manager as well, will depend upon the nature and scale of the operation. The two main areas of concern are competence and an individual's capacity to meet his responsibilities.

2. As regards competence in the different areas of responsibility, there should not be any difference from the requirements applicable to persons holding only one post.

3. The capacity of an individual to meet his responsibilities will primarily be dependent upon the scale of the operation. However, the complexity of the organisation or of the operation may prevent, or limit, combinations of posts which may be acceptable in other circumstances.

4. In most circumstances, the responsibilities of a nominated postholder will rest with a single individual. However, in the area of ground operations, it may be acceptable for these responsibilities to be split, provided that the responsibilities of each individual concerned are clearly defined.

5. The intent of ANTR OPS 3.175 is neither to prescribe any specific organisational hierarchy within the operator's organisation nor to prevent an Authority from requiring a certain hierarchy before it is satisfied that the management organisation is suitable.

AC OPS 3.175(l) & (m)
Employment of staff
See ANTR OPS 3.175(l) & (m)

In the context of ANTR OPS 3.175(l) & (m), the expression "full-time staff" means members of staff who are employed for not less than (an average of) 35 hours per week excluding vacation periods. For the purpose of establishing the scale of operation, administrative staff, not directly involved in operations or maintenance, should be excluded.

IEM OPS 3.175
The management organisation of an AOC/Authorisation holder
See ANTR OPS 3.175(g) - (o)

1 Function and Purpose

1.1 The safe conduct of air operations is achieved by the operator and an Authority working in harmony towards a common aim. The functions of the two bodies are different, well defined, but complementary. In essence, the operator complies with the standards set through putting in place a sound and competent management structure. The BCAA working within a framework of law statutes), sets and monitors the standards expected from operators.

2 Responsibilities of Management

2.1 The responsibilities of management related to OPS Part 3 should include at least the following five main functions:

a. Determination of the operator's flight safety policy;

b. Allocation of responsibilities and duties and issuing instructions to individuals, sufficient for implementation of company policy and the maintenance of safety standards;

c. Monitoring of flight safety standards;

d. Recording and analysis of any deviations from company standards and ensuring corrective action;

e. Evaluating the safety record of the company in order to avoid the development of undesirable trends.

IEM OPS 3.175(c)(2)
Principal place of business
See ANTR OPS 3.175(c)(2)

1 ANTR OPS 3.175(c)(2) requires the operator to have his principal place of business located in the Kingdom of Bahrain.

2 In order to ensure proper jurisdiction over the operator, the term ‘principal place of business’ is interpreted as meaning the State in which the administrative headquarters and the operator’s operational and maintenance management are based.

IEM OPS 3.185(b)
Maintenance management exposition details
See ANTR OPS 3.185(b)

1 The operator's organisation’s maintenance management exposition should reflect the details of any sub-contract(s).

2 A change of helicopter type or of the approved maintenance organisation may require the submission of an acceptable amendment to the operator's management exposition.

Note: Refer to ANTR M

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AC/AMC/IEM D – OPERATIONAL PROCEDURES

AC OPS 3.195
Operational Control
See ANTR OPS 3.195

1 Operational control means the exercise by the operator, in the interest of safety, of responsibility for the initiation, continuation, termination or diversion of a flight. This does not imply a requirement for licensed flight dispatchers or a full flight watch system.

2 The organisation and methods established to exercise operational control should be included in the operations manual and should cover at least a description of responsibilities concerning the initiation, continuation, termination or diversion of each flight.

AMC OPS 3.210(a)
Establishment of procedures
See ANTR OPS 3.210(a)

The operator should specify the contents of safety briefings for all cabin crew members prior to the commencement of a flight or series of flights.

IEM OPS 3.210(b)
Establishment of procedures
See ANTR OPS 3.210

When the operator establishes procedures and a checklist system for use by cabin crew with respect to the helicopter cabin, at least the following items should be taken into account:

	ITEM	PRE-TAKE- OFF	IN-FLIGHT	PRE-LANDING	POST-LANDING
1.	Brief of cabin crew by the senior cabin crew member prior to commencement of a flight or series of flights.	x			
2.	Check of safety equipment in accordance with operator's policies and procedures.	x			
3.	Security checks as required by Subpart S (ANTR OPS 3.1250).	x			x
4.	Supervision of passenger embarkation and disembarkation (ANTR OPS 3.075; ANTR OPS 3.105; ANTR OPS 3.270; ANTR- ANTR OPS 3.280; ANTR OPS 3.305).	x			x
5.	Securing of passenger cabin (e.g. seat belts, cabin cargo/baggage etc. (ANTR OPS 3.280; ANTR OPS 3.285; ANTR OPS 3.310).	x		x	
6.	Securing of galleys and stowage of equipment (ANTR OPS 3.325).	x		x	
7.	Intentionally left blank.				
8.	Intentionally left blank.				
9.	'Cabin secure' report to flight crew.	x		x	
10.	Operation of cabin lights.	x	if required	x	
11.	Cabin crew at crew stations for take-off and landing. (ANTR OPS 3.210(c)/IEM OPS 3.210(c), ANTR OPS 3.310).	x		x	x
12.	Surveillance of passenger cabin.	x	x	x	x
13.	Prevention and detection of fire in the cabin, galleys and toilets and instructions for actions to be taken.	x	x	x	x
14.	Action to be taken when turbulence is encountered. (See also ANTR OPS 3.320 and ANTR OPS 3.325).	x	x		
15.	Intentionally left blank.	x			
16.	Reporting of any deficiency and/or unserviceability of equipment.	x	x	x	x

AC OPS 3.210(d)
Establishment of procedures
See ANTR OPS 3.210

The intent of this paragraph is to ensure that the pilot remains at the controls when the rotors are turning under power whilst not preventing ground runs being conducted by qualified personnel other than pilots. The operator should ensure that the qualification of personnel, other than pilots, who are authorised to conduct ground runs is described in the appropriate manual.

AMC No 1 to ANTR OPS 3.220
Authorisation of Heliports or Landing Locations by the operator
See ANTR OPS 3.220

1 When defining sites for use as heliports (including infrequent or temporary heliports or landing locations) for the type(s) of helicopter(s) and operation(s) concerned, the operator should take account of the following:

2 An adequate site is a site which the operator considers to be satisfactory, taking account of the applicable performance requirements and site characteristics (guidance on standards and criteria are contained in ICAO Annex 14 Volume 2 and in the ICAO 'Heliport Manual' (Doc 9261-AN/903)).

3 The operator should have in place a procedure for the survey of sites by a competent person. Such a procedure should take account for possible changes to the site characteristics which may have taken place since last surveyed.

4 Sites which are pre-surveyed should be specifically authorised in the operator's Operations Manual. The Operations Manual should contain diagrams or/and ground and aerial photographs, and depiction (pictorial) and description of:

a. The overall dimensions of the site;

b. Location and height of relevant obstacles to approach and take-off profiles, and in the manoeuvring area;

c. Approach and take-off flight paths;

d. Surface condition (blowing dust/snow/sand);

e. Helicopter types authorised with reference to performance requirements;

f. Provision of control of third parties on the ground (if applicable);

g. Rescue and Fire Fighting Services;

h. Procedure for activating site with land owner or controlling authority;

i. Other useful information, for example appropriate ATS agency and frequency;

j. Lighting (if applicable);

5 For sites which are not pre-surveyed, the Operator should have in place a procedure which enables the pilot to make, from the air, a judgment on the suitability of a site. Items (a) to (f) inclusive in (4) above should be considered.

6 Operations to non pre-surveyed sites by night (except in accordance with Appendix 1 to 3.005(d) - (c)(2)(i)(C)) should not be permitted.

AMC No 2 to ANTR OPS 3.220
Authorisation of Heliports or Landing Locations by the operator - Helidecks
See ANTR OPS 3.220
See ANTR OPS 3.1045

1 The content of Part C of the Operations Manual relating to the specific authorisation of helidecks should contain both the listing of helideck limitations in a Helideck Limitations List (HLL) and a pictorial representation (template) of each helideck showing all necessary information of a permanent nature. The HLL will show, and be amended as necessary to indicate, the most recent status of each helideck

concerning non-compliance with ICAO Annex 14 Volume 2, limitations, warnings, cautions or other comments of operational importance. An example of a typical template is shown in Figure 1.

2 In order to ensure that the safety of flights is not compromised, the operator should obtain relevant information and details for compilation of the HLL, and the pictorial representation, from the owner/operator of the helideck.

3 When listing helidecks, if more than one name of the helideck exists, the most common name should be used, other names should also be included. After renaming a helideck, the old name should be included in the HLL for the ensuing 6 months.

4 All helideck limitations should be included in the HLL. Helidecks without limitations should also be listed. With complex installations and combinations of installations (e.g. co-locations), a separate listing in the HLL, accompanied by diagrams where necessary, may be required.

5 Each helideck should be assessed (based on limitations, warnings, cautions or comments) to determine its acceptability with respect to the following which, as a minimum, should cover the factors listed below:

a. The physical characteristics of the helideck.

b. The preservation of obstacle protected surfaces is the most basic safeguard for all flights.

These surfaces are:

(i) The minimum 210° obstacle free surface (OFS);

(ii) The 150° limited obstacle surface (LOS); and

(iii) The minimum 180° falling "5:1" - gradient with respect to significant obstacles. If this is infringed or if an adjacent installation or vessel infringes the obstacle clearance surfaces or criteria related to a helideck, an assessment should be made to determine any possible negative effect which may lead to operating restrictions.

c. Marking and lighting:

(i) Adequate perimeter lighting;

(ii) Adequate floodlighting;

(iii) Status lights (NB for night and day operations e.g. Aldis Lamp);

(iv) Dominant obstacle paint schemes and lighting;

(v) Helideck markings; and

(vi) General installation lighting levels. Any limited authorisation in this respect should be annotated "daylight only operations" on the HLL.

d. Deck surface:

(i) Surface friction;

(ii) Helideck net;

(iii) Drainage system;

(iv) Deck edge netting;

(v) Tie down system; and

(vi) Cleaning of all contaminants.

e. Environment:

(i) Foreign Object Damage;

(ii) Physical turbulence generators;

(iii) Bird control,

(iv) Air quality degradation due to exhaust emissions, hot gas vents or cold gas vents; and

(v) Adjacent helidecks may need to be included in air quality assessment.

f. Rescue and fire fighting:

(i) Primary and complementary media types, quantities, capacity and systems personal protective equipment and clothing, breathing apparatus; and

(ii) Crash box;

g. Communications & Navigation:

(i) Aeronautical Radio(s);

(ii) R/T callsign to match helideck name and side identification which should be simple and unique;

(iii) NDB or equivalent (as appropriate);

(iv) Radio log; and

(v) Light signal (e.g. Aldis Lamp).

h. Fuelling facilities:

(i) In accordance with the relevant national guidance and regulations; .

i. Additional operational and handling equipment:

(i) Windsock;

(ii) Wind recording;

(iii) Deck motion recording and reporting where applicable;

(iv) Passenger briefing system;

(v) Chocks;

(vi) Tie downs; and

(vii) Weighing scales.

j. Personnel:

(i) Trained helideck staff (e.g. Helicopter Landing Officer/Helicopter Deck Assistant and fire fighters etc.).

k. Other:

(i) as appropriate.

6 For helidecks about which there is incomplete information, a 'limited' authorisation based on the information available may be issued by the operator prior to the first helicopter visit. During subsequent operations and before full authorisation is given, information should be gathered and the following procedures should apply:

a. Pictorial (static) representation:

(i) Template (see figure 1) blanks should be available, to be filled out during flight preparation on the basis of the information given by the helideck owner/operator and flight crew observations.

(ii) Where possible, suitably annotated photographs may be used until the HLL and tem plate has been completed.

(iii) Until the HLL and Template has been completed, operational restrictions (e.g. performance, routing etc.) may be applied.

(iv) Any previous inspection reports should be obtained by the operator.

(v) An inspection of the helideck should be carried out to verify the content of the completed HLL and template, following which the helideck may be fully authorised for operations.

b. With reference to the above, the HLL should contain at least the following:

(i) HLL revision date and number;

(ii) Generic list of helideck motion limitations;

(iii) Name of Helideck;

(iv) ‘D’-value of the helideck; and

(v) Limitations, warnings, cautions and comments.

c. The template should contain at least the following (see example below):

(i) Installation/Vessel name;

(ii) R/T Callsign;

(iii) Helideck Identification Marking;

(iv) Side Panel Identification Marking;

(v) Helideck elevation;

(vi) Maximum installation/vessel height;

(vii) 'D' Value;

(viii) Type of installation/vessel;

- Fixed manned
- Fixed unmanned
- Ship type (e.g. diving support vessel)
- Semi-submersible
- Jack-up

(ix) Name of owner/operator;

(x) Geographical position;

(xi) Com/Nav Frequencies and Ident;

(xii) General drawing preferably looking into the helideck with annotations showing location of derrick, masts, cranes, flare stack, turbine and gas exhausts, side identification panels, windsock etc.;

(xiii) Plan view drawing, chart orientation from the general drawing, to show the above. The plan view will also show the 210 degree bisector orientation in degrees true;

(xiv) Type of fuelling:

- Pressure and Gravity
- Pressure only
- Gravity only
- None

(xv) Type and nature of fire fighting equipment;

(xvi) Availability of GPU;

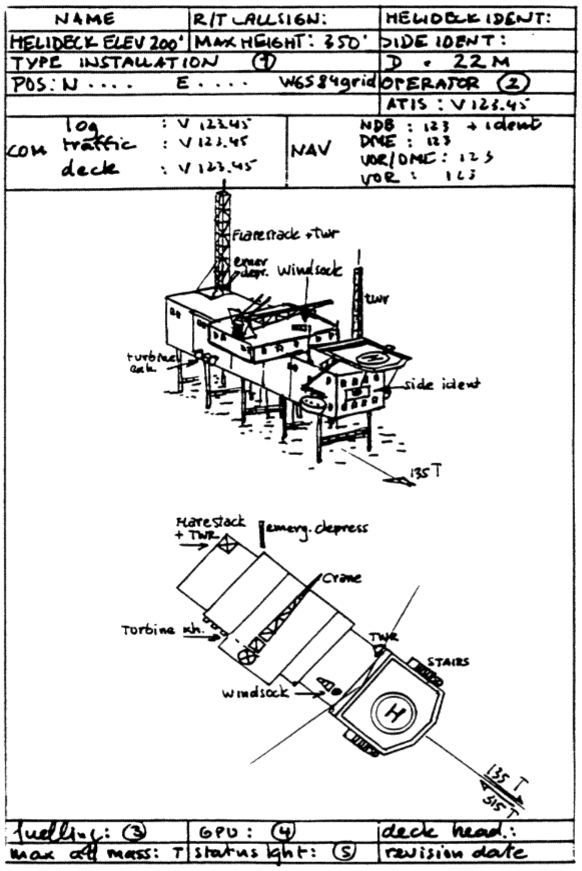
(xvii) Deck heading;

(xviii) Maximum allowable mass;

(xix) Status light (Yes/No); and

(xx) Revision date of publication.

Figure 1 – Helideck Template



1. Fixed manned; fixed unmanned; small ship; large ship; semi-submersible; jack-up.
2. NAM, AMOCO etc.
3. Pressure/gravity; pressure; gravity; no.
4. Yes; no; 28V DC.
5. Yes; no.

IEM OPS 3.240(a)(6)
Coastal Transit
See ANTR OPS 3.240(a)(6)

1 Introduction

1.1 A helicopter operating overwater in Performance Class 3, has to have certain equipment fitted. This equipment varies with the distance from land that the helicopter is expected to operate. The aim of this IEM is to discuss that distance, bring into focus what fit is required and to clarify the operator's responsibility, when a decision is made to conduct coastal transit operations.

1.2 The coastal corridor facility may or may not be available in a particular state, as it is related to the State definition of open sea area as described in the definition of hostile environment and IEM 3.480(a)(12).

1.3 Where the term Coastal Transit is used, it means the conduct of operations overwater within the coastal corridor in conditions where there is reasonable expectation that; the flight can be conducted safely in the conditions prevailing; and, following an engine failure, a safe forced landing and successful evacuation can be achieved; and survival of the crew and passengers can be assured until rescue is effected.

1.4 Coastal corridor is a variable distance from the coastline to a maximum distance corresponding to 3 minutes flying at normal cruising speed.

2 Establishing the width of the coastal corridor.

2.1 The distance from land of Coastal Transit, is defined the boundary of a corridor that extends from the land, to a maximum distance of up to 3 minutes at normal cruising speed (approximately 5 - 6 nm). Landin this context includes sustainable ice (see a. to c. below) and, where the coastal region includes islands, the surrounding waters may be included in the corridor and aggregated with the coast and each other. Coastal transit need not be applied to inland waterways, estuary crossing or river transit.

a. In some areas, the formation of ice is such that it can be possible to land, or force land, without hazard to the helicopter or occupants. Unless the BCAA considers that operating to, or over, such ice fields is unacceptable, the operator may regard the definition of the "land" extends to these areas.

b. The interpretation of the following rules may be conditional on a. above:

ANTR OPS 3.240(a)(6)

ANTR OPS 3.825

ANTR OPS 3.827

ANTR OPS 3.830

ANTR OPS 3.843

c. In view of the fact that such featureless and flat white surfaces could present a hazard and could lead to white-out conditions, the definition of land does not extend to flights over ice fields in the following rules:

ANTR OPS 3.650(i)

ANTR OPS 3.660

2.2 The width of the corridor is variable from not safe to conduct operations in the conditions prevailing, to the maximum of 3 minutes wide. A number of factors will, on the day, indicate if it can be used - and how wide it can be. These factors will include but not be restricted to:

a. The meteorological conditions prevailing in the corridor;

b. The instrument fit of the aircraft;

c. The certification of the aircraft - particularly with regard to floats;

d. The sea state;

e. The temperature of the water;

f. The time to rescue; and

g. The survival equipment carried.

These can be broadly divided into three functional groups:

Those which meet the requirement for safe flying - a. and b..

Those which meet the requirement for a safe forced landing and evacuation - a., b., c. and d.

Those which meet the requirement for survival following a forced landing and successful evacuation - a., d., e., f. and g..

3 Requirement for safe flying

3.1 It is generally recognised that when flying out of sight of land in certain meteorological conditions, such as occur in high pressure weather patterns (goldfish bowl - no horizon, light winds and low visibility), the absence of a basic panel (and training) can lead to disorientation. In addition, lack of depth perception in these conditions demands the use of a radio altimeter with an audio voice warning as an added safety benefit - particularly when autorotation to the surface of the water may be required.

3.2 In these conditions a helicopter, without the required instruments and radio altimeter, should be confined to a corridor in which a pilot can maintain reference using the visual cues on the land.

4 Requirement for a safe forced landing and evacuation

4.1 Weather and sea state both affect the outcome of an autorotation following an engine failure. It isrecognised that the measurement of sea state is problematical and when assessing such conditions, good judgement has to be exercised by the operator and the commander.

4.2 Where floats have been certificated only for emergency use (and not for ditching), operations must be limited to those sea states which meet the requirement for such use - where a safe evacuation is possible.

(Ditching certification requires compliance with a comprehensive number of requirements relating to rotorcraft water entry, flotation and trim, occupant egress and occupant survival. Emergency flotation systems, generally fitted to smaller Part 27 rotorcraft, are approved against a broad requirement that the equipment must perform its intended function and not hazard the rotorcraft or its occupants. In practice, the most significant difference between ditching and emergency flotation systems is substantiation of the water entry phase. Ditching requirements call for water entry procedures and techniques to be established and promulgated in the Flight Manual. The fuselage/flotation equipment must thereafter be shown to be able to withstand loads under defined water entry conditions which relate to these procedures. For emergency flotation equipment, there is no requirement to define the water entry technique and no specific conditions defined for the structural substantiation.)

5 Requirements for survival

5.1 Survival of crew members and passengers, following a successful autorotation and evacuation, is dependant on the clothing worn, the equipment carried and worn, the temperature of the sea and thesea state (see IEM OPS 3.827). Search and rescue response/capability consistent with the anticipated exposure should be available before the conditions in the corridor can be considered non -hostile.

5.2 Coastal Transit can be conducted providing the requirements of paragraph 3 and 4 are met, and the conditions for a non-hostile coastal corridor are satisfied.

IEM OPS 3.243
Operations in areas with specific navigation performance requirements
See ANTR OPS 3.243

1 The requirements and procedures relating to areas in which minimum navigation performance specifications are prescribed, based on Regional Air Navigation Agreements, are covered (as indicated for the type of navigation performance specification) in the following documentation:

a. RNP information and associated procedures - ICAO DOC 9613; and

b. EUROCONTROL Standards on Area Navigation to comply with RNP/RNAV.

c. For General Guidance on Performance Based Navigation Manual - ICAO Doc 9613

2 The following explanatory material has been developed to explain the subject of Required Navigation Performance (RNP) more fully:

a. Objective of RNP - The RNP concept will replace the conventional method of ensuring required navigation performance by requiring the carriage of specific navigation equipment by worldwide, uniform standards of navigation performance for defined airspace and/or flight procedures. It is therefore up to the operator to decide which system(s) he will utilise to meet the requirements. However, the operator must ensure that the system(s) used is certificated for operations in the airspace concerned.

b. Navigational Accuracy - RNP is defined as a statement of the navigational accuracy required for operation within a defined area of airspace. Navigational accuracy is based upon a combination of navigation sensor error, airborne sensor error, display error and flight technical error in the horizontal plane. The level of accuracy is expressed as a single parameter and it defines the distance from helicopter’s intended position within which the aircraft must be maintained for at least 95% of the total flying time. As an example, RNP 4 means that all aircraft remain within 4 nm of their intended positions for at least 95% of the total flying time.

c. PBN for En-Route Operations - In order to consider the requirements for performance-based navigation for various areas of airspace and/or routes, RNP types have been defined for worldwide, uniform application in en-route operations as follows:

i. RNP 1 requires highly accurate position information and will be associated with high-density continental traffic. Full exploitation of the benefits of RNP 1 (in connection with area navigation (RNAV)) will require that a high percentage of aircraft achieves this level of navigation performance.

ii. RNP 4 will normally be applied in continental areas in which the route structure is presently based on VOR/DME.

3 GNSS equipment should be in compliance with the RNP navigation requirements of ICAO Document 9631 – Performance Based Navigation Manual.

IEM OPS 3.250
Establishment of Minimum Flight Altitudes
See ANTR OPS 3.250

1 The following are examples of some of the methods available for calculating minimum flight altitudes.

2 KSS Formula

2.1 Minimum obstacle clearance altitude (MOCA). MOCA is the sum of:

i. The maximum terrain or obstacle elevation whichever is highest; plus

ii. 1 000 ft for elevation up to and including 6 000 ft; or

iii 2 000 ft for elevation exceeding 6 000 ft rounded up to the next 100 ft.

2.1.1 The lowest MOCA to be indicated is 2 000 ft.

2.1.2 From a VOR station, the corridor width is defined as a borderline starting 5 nm either side of the VOR, diverging 4° from centreline until a width of 20 nm is reached at 70 nm out, thence paralleling the centreline until 140 nm out, thence again diverging 4° until a maximum width of 40 nm is reached at 280 nm out. Thereafter the width remains constant.

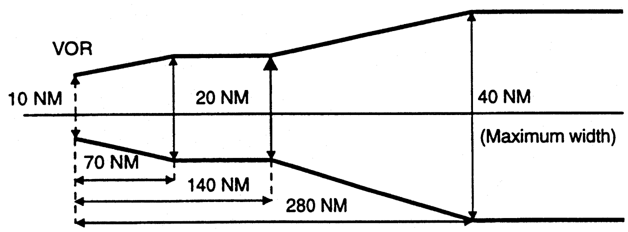


FIGURE 1

2.1.3 From an NDB, similarly, the corridor width is defined as a borderline starting 5 nm either side of the NDB diverging 7° until a width of 20 nm is reached 40 nm out, thence paralleling the centreline until 80 nm out, thence again diverging 7° until a maximum width of 60 nm is reached 245 nm out. Thereafter the width remains constant.

2.1.4 MOCA does not cover any overlapping of the corridor.

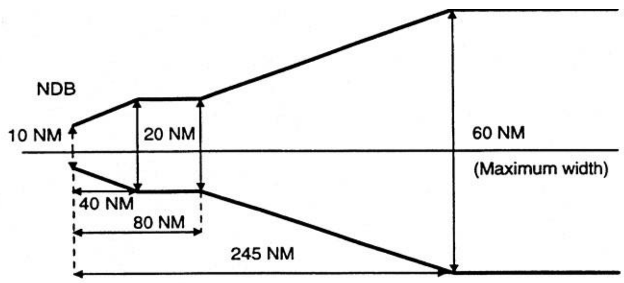


FIGURE 2

2.2 Minimum off–route altitude (MORA). MORA is calculated for an area bounded by every or every second LAT/LONG square on the Route Facility Chart (RFC)/Terminal Approach Chart (TAC) and is based on a terrain clearance as follows:

i. Terrain with elevation up to 6 000 ft (2 000 m) – 1 000 ft above the highest terrain and obstructions;

ii. Terrain with elevation above 6 000 ft (2 000 m) – 2 000 ft above the highest terrain and obstructions.

3 Jeppesen Formula

3.1 MORA is a minimum flight altitude computed by Jeppesen from current ONC or WAC charts. Two types of MORAs are charted which are:

i. Route MORAs e.g. 9800a; and

ii. Grid MORAs e.g. 98.

3.2 Route MORA values are computed on the basis of an area extending 10 nm to either side of route centreline and including a 10 nm radius beyond the radio fix/reporting point or mileage break defining the route segment.

3.3 MORA values clear all terrain and man–made obstacles by 1 000 ft in areas where the highest terrain elevation or obstacles are up to 5 000 ft. A clearance of 2 000 ft is provided above all terrain or obstacles which are 5 001 ft and above.

3.4 A Grid MORA is an altitude computed by Jeppesen and the values are shown within each Grid formed by charted lines of latitude and longitude. Figures are shown in thousands and hundreds of feet (omitting the last two digits so as to avoid chart congestion). Values followed by ± are believed not to exceed the altitudes shown. The same clearance criteria as explained in paragraph 3.3 above apply.

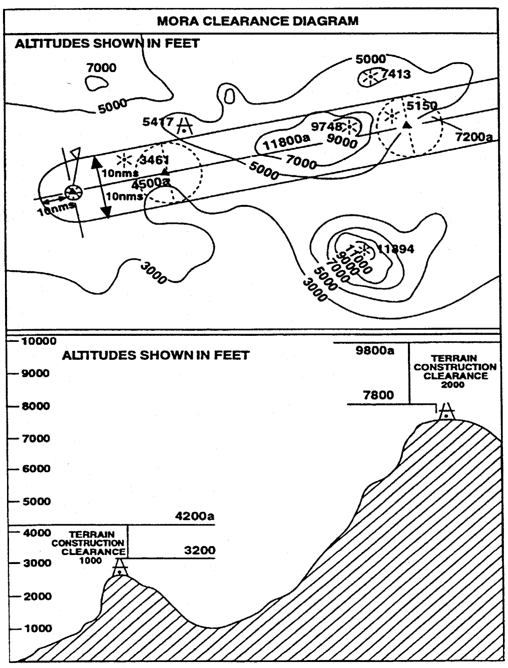


FIGURE 3

4 ATLAS Formula

4.1 Minimum safe En–route Altitude (MEA). Calculation of the MEA is based on the elevation of the highest point along the route segment concerned (extending from navigational aid to navigational aid) within a distance on either side of track as specified below:

i. Segment length up to 100 nm – 10 nm (See Note 1 below).

ii. Segment length more than 100 nm – 10% of the segment length up to a maximum of 60 nm See Note 2 below).

Note 1: This distance may be reduced to 5 nm within TMAs where, due to the number and type of available navigational aids, a high degree of navigational accuracy is warranted.

Note 2: In exceptional cases, where this calculation results in an operationally impracticable value, an additional special MEA may be calculated based on a distance of not less than 10 nm either side of track. Such special MEA will be shown together with an indication of the actual width of protected airspace.

4.2 The MEA is calculated by adding an increment to the elevation specified above as appropriate:

Elevation of highest point	Increment
Not above 5 000 ft	1 500 ft
Above 5 000 ft but not above 10 000 ft	2 000 ft
Above 10 000 ft	10% of elevation plus 1 000 ft

NOTE: For the last route segment ending over the initial approach fix, a reduction to 1 000 ft is permissible within TMAs where, due to the number and type of available navigation aids, a high degree of navigational accuracy is warranted.

The resulting value is adjusted to the nearest 100 ft.

4.3 Minimum safe Grid Altitude (MGA). Calculation of the MGA is based on the elevation of the highest point within the respective grid area.

The MGA is calculated by adding an increment to the elevation specified above as appropriate:

Elevation of highest point	Increment
Not above 5 000 ft	1 500 ft
Above 5 000 ft but not above 10 000 ft	2 000 ft
Above 10 000 ft	10% of elevation plus 1 000 ft

The resulting value is adjusted to the nearest 100 ft.

AMC OPS 3.255
Fuel and Oil Requirements/Policy
See ANTR OPS 3.255

The operator should base the company fuel policy, including calculation of the amount of fuel to be carried, on the following planning criteria:

1 The amount of:

1.1 Taxy fuel, which should not be less than the amount, expected to be used prior to take-off. Local conditions at the departure heliport or landing location and APU consumption should be taken into account.

1.2 Trip fuel, which should include:

a. Fuel for take-off and climb from heliport or landing location elevation to initial cruising level/altitude, taking into account the expected departure routing;

b. Fuel from top of climb to top of descent, including any step climb/descent;

c. Fuel from top of descent to the point where the approach procedure is initiated, taking into account the expected arrival procedure; and

d. Fuel for approach and landing at the destination heliport or landing location.

1.3 Contingency fuel, which should be:

a. For IFR flights, or for VFR flights in a hostile environment, 10% of the planned trip fuel; or

b. For VFR flights in a non-hostile environment, 5% of the planned trip fuel;

1.4 Alternate fuel, which should be:

a. Fuel for a missed approach from the applicable MDA/DH at the destination heliport or landing locationto missed approach altitude, taking into account the complete missed approach procedure;

b. Fuel for a climb from missed approach altitude to cruising level/altitude;

c. Fuel for the cruise from top of climb to top of descent;

d. Fuel for descent from top of descent to the point where the approach is initiated, taking into account the expected arrival procedure; and

e. Fuel for executing an approach and landing at the destination alternate heliport or landing location selected in accordance with ANTR OPS 3.295.

f. For helicopters operating to or from helidecks located in a hostile environment, 10% of a. to e. above.

1.5 Final reserve fuel, which should be:

a. For VFR flights navigating by day with reference to visual landmarks, 20 minutes fuel at best range speed; or

b. For IFR flights or when flying VFR and navigating by means other than by reference to visual landmarks or at night, fuel to fly for 30 minutes at holding speed at 1 500 ft (450 m) above the destination heliport or landing location in standard conditions calculated with the estimated mass on arrival above the alternate, or the destination, when no alternate is required.

1.6 Extra fuel, which should be at the discretion of the commander.

2 Isolated heliport or landing location IFR procedure. If the operator's fuel policy includes planning to an isolated heliport or landing location flying IFR, or when flying VFR and navigating by means other thanby reference to visual landmarks, for which a destination alternate does not exist, the amount of fuel at departure should include:

a. Taxy fuel;

b. Trip fuel;

c. Contingency fuel calculated in accordance with sub-paragraph 1.3 above;

d. Additional fuel to fly for two hours at holding speed including final reserve fuel; and

e. Extra fuel at the discretion of the commander.

3 Sufficient fuel should be carried at all times to ensure that following the failure of a power unit which occurs at the most critical point along the route, the helicopter is able to:

a. Descend as necessary and proceed to an adequate heliport or landing location; and

b. Hold there for 15 minutes at 1 500 ft (450 m) above heliport or landing location elevation in standard conditions; and

c. Make an approach and landing. (See IEM OPS 3.500(a)(5) and IEM OPS 3.530(a)(5)).

IEM OPS 3.255(c)(3)(i)
Contingency Fuel
See ANTR OPS 3.255(c)(3)(i)

1 At the planning stage, not all factors which could have an influence on the fuel consumption to the destination heliport or landing location can be foreseen. Therefore, contingency fuel is carried to compensate for items such as:

i. Deviations of an individual helicopter from the expected fuel consumption data;

ii. Deviations from forecast meteorological conditions; and

iii. Deviations from planned routings and/or cruising levels/altitudes.

IEM OPS 3.260
Carriage of persons with Reduced Mobility
See ANTR OPS 3.260

1 A person with reduced mobility (PRM) is understood to mean a person whose mobility is reduced due to physical incapacity (sensory or locomotory), an intellectual deficiency, age, illness or any other cause of disability when using transport and when the situation needs special attention and the adaptation to a person's need of the service made available to all passengers.

2 In normal circumstances PRMs should not be seated adjacent to an emergency exit.

3 In circumstances in which the number of PRMs forms a significant proportion of the total number of passengers carried on board:

a. The number of PRMs should not exceed the number of able-bodied persons capable of assisting with an emergency evacuation; and

b. The guidance given in paragraph 2 above should be followed to the maximum extent possible.

AMC OPS 3.270
Cargo carriage in the passenger cabin
See ANTR OPS 3.270

1 In establishing procedures for the carriage of cargo in the passenger cabin of a helicopter, the operator should observe the following:

a. That the weight of the cargo does not exceed the structural loading limit(s) of the cabin floor or seat(s);

b. That the number/type of restraint devices and their attachment points should be capable of restraining the cargo in accordance with ~~CS-25~~ the respective Certification Specification / TCDS as accepted by BCAA for Large Transport Category Aeroplane or equivalent;

c. That the location of the cargo should be such that, in the event of an emergency evacuation, it will not hinder egress nor impair the cabin crew's view.

AC No. 1 to ANTR OPS 3.280
Passenger Seating
See ANTR OPS 3.280
See AC No. 2 to ANTR OPS 3.280

1 The operator should make provision so that:

a. Those passengers who are allocated seats which permit direct access to emergency exits, appear to be reasonably fit, strong and able to assist the rapid evacuation of the helicopter in an emergency after an appropriate briefing by the crew;

b. In all cases, passengers who, because of their condition, might hinder other passengers during an evacuation or who might impede the crew in carrying out their duties, should not be allocated seats which permit direct access to emergency exits. If the operator is unable to establish proce dures which can be implemented at the time of passenger 'check-in', he should establish an alternative procedure acceptable to the BCAA that the correct seat allocations will, in due course, be made.

2 The above text does not apply to helicopters where the normal exit also serves as an emergency exit. However in these circumstances, the operator should apply discretion when choosing passengers to sit next to a normal exit to ensure that evacuation is not hindered in the case of an emergency.

AC No. 2 to ANTR OPS 3.280
Passenger Seating
See ANTR OPS 3.280
See AC No. 1 to ANTR OPS 3.280

1 The following categories of passengers are among those who should not be allocated to, or directed to seats which permit direct access to emergency exits:

a. Passengers suffering from obvious physical, or mental, handicap to the extent that they would have difficulty in moving quickly if asked to do so;

b. Passengers who are either substantially blind or substantially deaf to the extent that they might not readily assimilate printed or verbal instructions given;

c. Passengers who because of age or sickness are so frail that they have difficulty in moving quickly;

d. Passengers who are so obese that they would have difficulty in moving quickly or reaching and passing through the adjacent emergency exit;

e. Children (whether accompanied or not) and infants;

f. Deportees or persons in custody; and,

g. Passengers with animals.

Note: "Direct access" means a seat from which a passenger can proceed directly to the exit without entering an aisle or passing around an obstruction.

AMC OPS 3.295(c)(1)
Selection of Heliports or Landing Locations
See ANTR OPS 3.295(c)(1)

1 Any alleviation from the requirement to select an alternate heliport or landing location for a flight to a coastal heliport or landing location under IFR is applicable only to helicopters routing from offshore, and should be based on an individual safety case assessment.

2 The following should be taken into account:

2.1. Suitability of the weather based on the landing forecast for the destination;

2.2. The fuel required to meet the IFR requirements of ANTR OPS 3.255 less alternate fuel;

2.3. Where the destination coastal heliport or landing location is not directly on the coast it should be:

a. Within a distance that, with the fuel specified in 2.2. above, the helicopter can, at any time after crossing the coastline, return to the coast, descend safely and carry out a visual approach and landing with VFR fuel reserves intact, and

b. Geographically sited so that the helicopter can, within the Rules of the Air, and within the landing forecast:

(i) proceed inbound from the coast at 500 ft AGL and carry out a visual approach and landing; or

(ii) proceed inbound from the coast on an agreed route and carry out a visual approach and landing.

2.4. Procedures for coastal heliports or landing locations should be based on a landing forecast no worse than:

a. By Day. A cloud base of DH/MDH + 400ft, and a visibility of 4km, or, if descent over the sea is intended, a cloud base of 600ft and a visibility of 4km.

b. By Night. A cloud base of 1 000ft and a visibility of 5km.

2.5. The descent to establish visual contact with the surface should take place over the sea or as part of the instrument approach;

2.6. Routings and procedures for coastal heliports or landing locations nominated as such should be included in the Operations Manual Part C - Route and Heliport or Landing Location Instructions and Information;

2.7. The MEL should reflect the requirement for Airborne Radar and Radio Altimeter for this type of operation;

2.8. Operational limitations for each coastal heliport or landing location should be acceptable to the BCAA.

IEM OPS 3.295(c)(1)
Selection of Heliports or Landing Locations
See ANTR OPS 3.395(c)(1)

1 The procedures contained in AMC OPS 3.295(c)(1) are weather critical. Consequently, a "Landing forecast" conforming to the standards contained in the Regional Air Navigation Plan and ICAO Annex 3 has been specified.

2 The "Landing forecast" consists of a concise statement of the mean or average meteorological conditions expected at an aerodrome or heliport or landing location during the two-hour period immediately following the time of issue. It contains surface wind, visibility, significant weather and cloud elements, and may contain other significant information, such as barometric pressure and temperature,as agreed between the meteorological authority and the operators concerned.

3 The detailed description of the landing forecast is promulgated in the ICAO Regional Air Navigation Plan and also in ICAO Annex 3, together with the operationally desirable accuracy of the forecast elements. In particular, the value of the observed cloud height and visibility elements should remain within the +/ - 30% of the forecast values in 90% of the cases.

4 The landing forecast most commonly takes the form of a routine or special selected meteorological report in the METAR code to which a TREND is added. The code words "NOSIG", i.e. no significantchange expected; "BECMG" (becoming); or "TEMPO" (temporarily); followed by the expected change,are used. The two-hour period of validity of the forecast commences at the time of the meteorological report.

AMC OPS 3.295 (e)
Selection of Heliports or Landing Locations
See ANTR OPS 3.295 (e)

1 Offshore alternate deck landing environment

The landing environment of a helideck that is proposed for use as an Offshore Alternate should be pre - surveyed and, as well as the physical characteristics, the effect of wind direction and strength, and turbulence established. This information, which should be available to the Commander at the planning stage and in flight, should be published in an appropriate form in the Operations Manual Part C (including the orientation of the helideck) such that the suitability of the helideck for use as an Offshore Alternate, can be assessed. The alternate helideck should meet the criteria for size and obstacle clearance appropriate to the performance requirements of the type of helicopter concerned.

2 Performance considerations

The use of an Offshore Alternate is restricted to helicopters which can achieve One Engine Inoperative (OEI) In Ground Effect (IGE) hover at an appropriate power rating at the Offshore alternate. Where the surface of the Offshore alternate helideck, or prevailing conditions (especially wind velocity), precludes an OEI In Ground Effect hover (IGE), OEI Out of Ground Effect (OGE) hover performance at an appropriate power rating should be used to compute the landing mass. The landing mass should be calculated from graphs provided in the relevant Part B of the Operations Manual. (When arriving at this landing mass, due account should be taken of helicopter configuration, environmental conditions and the operation of systems which have an adverse effect on performance.) The planned landing mass of the helicopter including crew, passengers, baggage, cargo plus 30 minutes Final Reserve fuel, should not exceed the OEI landing mass at the time of approach to the Offshore alternate.

3 Weather considerations

3.1 Meteorological Observations

When the use of an Offshore Alternate is planned, the meteorological observations at the destination and alternate heliport should be taken by an Observer acceptable to the BCAA responsible for the provision of meteorological services. (Appropriate automatic meteorological observations stations may be used if acceptable).

3.2 Weather Minima

When the use of an Offshore alternate is planned, the operator should not select a helideck as adestination or offshore alternate unless the aerodrome forecast, indicates that, during a period commencing one hour before and ending one hour after the expected time of arrival at the destination and offshore alternate, the weather conditions will be at or above the planning minima shown in Tabl e 1 below.

Table 1

	Day	Night
Cloud Base	600 ft	800 ft
Visibility	4 km	5 km

3.3 Conditions of Fog

Where fog is forecast, or has been observed within the last two hours within 60 nm of the destination or alternate, offshore alternates should not be used.

4 Actions at Point of No Return

Before passing the Point of No Return - which should not be more that 30 minutes from the destination - the following actions should have been completed:

4.1 Confirmation that navigation to the destination and offshore alternate can be assured.

4.2 Radio contact with the destination and offshore alternate (or master station) has been established.

4.3. The landing forecast at the destination and offshore alternate have been obtained and confirmed to beat or above the required minima.

4.4 The requirements for One Engine Inoperative landing (see paragraph 2 above) have been checked (in light of the latest reported weather conditions) to ensure that they can be met.

4.5 To the extent possible, having regard to information on current and forecast use of the offshore alternate and on conditions prevailing, the availability of the offshore alternate should be guaranteed by the duty holder (the rig operator in the case of fixed installations and the owner in the case of mobiles) until the landing at the destination, or the offshore alternate, has been achieved (or until offshore shuttling has been completed).

5 Offshore shuttling

Provided that the actions in paragraph 4 above have been completed, offshore shuttling, using an offshore alternate, may be carried out.

IEM OPS 3.295(e)
Off-shore alternates
See ANTR OPS 3.295(e)

When operating off shore, any spare payload capacity should be used to carry additional fuel if it would facilitate the use of an onshore alternate.

IEM OPS 3.295(e)(4)
Selection of Heliports or Landing Locations - landing forecast
See ANTR OPS 3.295(e)(4)

1 The procedures contained in AMC OPS 3.295(e) are weather critical. Consequently, meteorological data conforming to the standards contained in the Regional Air Navigation Plan and ICAO Annex 3 has been specified. As the following meteorological data is point specific, caution should be exercised when associating it with nearby heliports or landing locations (or helidecks).

2 Meteorological Reports (METARs)

2.1 Routine and special meteorological observations at offshore installations should be made during periods and at a frequency agreed between the meteorological authority and the operator concerned. They should comply with the requirements contained in the meteorological section of the ICAO Regional Air Navigation Plan, and should conform to the standards and recommended practices, including the desirable accuracy of observations, promulgated in ICAO Annex 3.

2.2 Routine and selected special reports are exchanged between meteorological offices in the METAR or SPECI code forms prescribed by the World Meteorological Organisation.

3 Aerodrome Forecasts (TAFS)

3.1 The aerodrome forecast consists of a concise statement of the mean or average meteorological conditions expected at an aerodrome or heliport or landing location during a specified period of validity, which is normally not less than 9 hours, or more than 24 hours in duration. The forecast includes surface wind, visibility, weather and cloud, and expected changes of one or more of these elements during the period. Additional elements may be included as agreed between the meteorological authorit y and the operators concerned. Where these forecasts relate to offshore installations, barometric pressure and temperature should be included to facilitate the planning of helicopter landing and take-off performance.

3.2 Aerodrome forecasts are most commonly exchanged in the TAF code form, and the detailed description of an aerodrome forecast is promulgated in the ICAO Regional Air Navigation Plan and also in ICAO Annex 3, together with the operationally desirable accuracy elements. In particular, the observed cloud height should remain within +/- 30% of the forecast value in 70% of cases, and the observed visibility should remain within +/- 30% of the forecast value in 80% 0f cases.

4 Landing Forecasts (TRENDS)

4.1 The landing forecast consists of a concise statement of the mean or average meteorological conditions expected at an aerodrome or heliport or landing location during the two-hour period immediately following the time of issue. It contains surface wind, visibility, significant weather and cloud elements,and other significant information, such as barometric pressure and temperature, as may be agreed between the meteorological authority and the operators concerned.

4.2 The detailed description of the landing forecast is promulgated in the ICAO Regional Air Navigation Plan and also in ICAO Annex 3, together with the operationally desirable accuracy of the forecast elements. In particular, the value of the observed cloud height and visibility elements should remain within +/ -30% of the forecast values in 90% of the cases.

4.3 Landing forecasts most commonly take the form of routine or special selected meteorological reports in the METAR code, to which either the code words “NOSIG”, i.e. no significant change expected; “BECMG” (becoming), or “TEMPO” (temporarily), followed by the expected change, are added. The two-hour period of validity commences at the time of the meteorological report.

AMC OPS 3.300
Submission of ATS Flight plan
See ANTR OPS 3.300

1 Flights without ATS flight plan. When unable to submit or to close the ATS flight plan due to lack of ATS facilities or any other means of communications to ATS, the operator should establish procedures, instructions and a list of authorised persons to be responsible for alerting search and rescue services.

2 To ensure that each flight is located at all times, these instructions should:

a. Provide the authorised person with at least the information required to be included in a VFR Flight plan, and the location, date and estimated time for re-establishing communications;

b. If an aircraft is overdue or missing, provide for notification to the appropriate ATS or Search and Rescue facility; and

c. Provide that the information will be retained at a designated place until the completion of the flight.

IEM OPS 3.305
Re/defueling with passengers on board or rotors turning
See ANTR OPS 3.305

When re/defueling with passengers on board, ground servicing activities and work inside the helicopter, such as catering and cleaning, should be conducted in such a manner that they do not create a hazard and that the aisles and emergency doors are unobstructed.

IEM OPS 3.307
Refuelling/Defuelling with wide-cut fuel
See ANTR OPS 3.307

1 'Wide-cut fuel' (designated JET B, JP-4 or AVTAG) is an aviation turbine fuel that falls between gasoline and kerosene in the distillation range and consequently, compared to kerosene (JET A or JET A1), it has properties of higher volatility (vapour pressure), lower flash point and lower freezing point.

2 Wherever possible, the operator should avoid the use of wide-cut fuel types. If a situation arises such that only wide-cut fuels are available for refuelling/defueling, operators should be aware that mixtures of wide-cut fuels and kerosene turbine fuels can result in the air/fuel mixture in the tank being in the combustible range at ambient temperatures. The extra precautions set out below are advisable to avoid arcing in the tank due to electrostatic discharge. The risk of this type of arcing can be minimised by the use of static dissipation additive in the fuel. When this additive is present in the proportions stated in the fuel specification, the normal fuelling precautions set out below are considered adequate.

3 Wide-cut fuel is considered to be “involved” when it is being supplied or when it is already present in aircraft fuel tanks.

4 When wide-cut fuel has been used, this should be recorded in the Technical Log. The next two uplifts of fuel should be treated as though they too involved the use of wide-cut fuel.

5 When refuelling/defueling with turbine fuels not containing a static dissipator, and where wide-cut fuels are involved, a substantial reduction in fuelling flow rate is advisable. Reduced fl ow rate, as recommended by fuel suppliers and/or helicopter manufacturers, has the following benefits:

a. It allows more time for any static charge build-up in the fuelling equipment to dissipate before the fuel enters the tank;

b. It reduces any charge which may build up due to splashing; and

c. Until the fuel inlet point is immersed, it reduces misting in the tank and consequently the extension of the flammable range of the fuel.

6 The flow rate reduction necessary is dependent upon the fuelling equipment in use and the type of filtration employed on the helicopter fuelling distribution system. It is difficult, therefore, to quote precise flow rates. Reduction in flow rate is advisable when pressure fuelling is employed.

IEM OPS 3.310(b)
Cabin crew seating positions
See ANTR OPS 3.310(b)

1 When determining cabin crew seating positions, the operator should ensure that they are:

i. Close to a floor level exit;

ii. Provided with a good view of the area(s) of the passenger cabin for which the cabin cre w member is responsible; and

iii. Evenly distributed throughout the cabin, in the above order of priority.

2 Paragraph 1 above should not be taken as implying that, in the event of there being more such cabincrew stations than required cabin crew, the number of cabin crew members should be increased.

AC OPS 3.346
Flight in expected or actual icing conditions
See ANTR OPS 3.346

1 The procedures to be established by the operator should take account of the design, the equipment or the configuration of the helicopter and also of the training which is needed. For these reasons, different helicopter types operated by the same company may require the development of different procedure s. In every case, the relevant limitations are those which are defined in the Helicopter Flight Manual (HFM) and other documents produced by the manufacturer.

2 For the required entries in the Operations Manual, the procedural principles which apply to fli ght in icing conditions are referred to under Appendix 1 to ANTR OPS 3.1045, A 8.3.8 and should be cross- referenced, where necessary, to supplementary, type-specific data under Appendix 1 to ANTR OPS 3.1045, B 4.1.

3 Technical content of the Procedures. The operator should ensure that the procedures take account ofthe following:

a. ANTR OPS 3.675;

b. The equipment and instruments which must be serviceable for flight in icing conditions;

c. The limitations on flight in icing conditions for each phase of fli ght. These limitations may be imposed by the helicopter's de-icing or anti-icing equipment or the necessary performance corrections which have to be made;

d. The criteria the Flight Crew should use to assess the effect of icing on the performance and/or controllability of the helicopter;

e. The means by which the Flight Crew detects, by visual cues or the use of the helicopter's ice detection system, that the flight is entering icing conditions; and

f. The action to be taken by the Flight Crew in a deteriorating situation (which may develop rapidly) resulting in an adverse affect on the performance and/or controllability of the helicopter, due to either:

i. the failure of the helicopter's anti-icing or de-icing equipment to control a build-up of ice, and/or

ii. ice build-up on unprotected areas.

4 Training for despatch and flight in expected or actual icing conditions. The content of the Operations Manual, Part D, should reflect the training, both conversion and recurrent, which Flight Crew, and all other relevant operational personnel will require in order to comply with the procedures for despatch and flight in icing conditions.

4.1 For the Flight Crew, the training should include:

a. Instruction in how to recognise, from weather reports or forecasts which are available before flight commences or during flight, the risks of encountering icing conditions along the planned route and on how to modify, as necessary, the departure and in-flight routes or profiles;

b. Instruction in the operational and performance limitations or margins;

c. The use of in-flight ice detection, anti-icing and de-icing systems in both normal and abnormal operation; and

d. Instruction in the differing intensities and forms of ice accretion and the consequent action which should be taken.

4.2 For Crew members other than flight crew, the training should include;

a. Awareness of the conditions likely to produce surface contamination; and

b. The need to inform the Flight Crew of significant ice accretion.

AC OPS 3.398
Airborne Collision Avoidance Systems (ACAS)
See ANTR OPS 3.398

1 Purpose

1.1 The purpose of this AC is to provide guidance to operators of aircraft that carry airborne collision avoidance systems (ACAS I) equipment. It includes information on the capabilities and limitations of the equipment, and the traffic advisories (TAs) it may generate, together with advice concerning the appropriate flight crew response. Information is also provided on details that should be included inchecklists, and in Operations and Training Manuals.

1.2 A list of definitions is provided in Appendix A.

2 General

2.1 Notwithstanding that a flight may be made with an air traffic control clearance, it remains the duty of a commander to take all possible measures to ensure that his aircraft does not collide with any other aircraft. Information from an air traffic control (ATC) system may be available, but this may do no more than provide advice as to the proximity of an aircraft that is perceived to constitute a potential threat and, possibly, advise the commander as to how he might best manoeuvre his aircraft to avoid it.

ACAS provides flight crew with an independent back up to visual search and the ATC system by alerting them to collision hazards.

As helicopter performance generally cannot comply with the avoidance criteria present in the algorithms for ACAS II, Resolution Advisories (RAs) and RA avoidance techniques are not covered by this AC. Unless otherwise stated in this document the term 'ACAS' refers to ACAS 1 systems

3 Examples of Limitations of ACAS Equipment

3.1 Dependence on Active Transponder Equipment

As ACAS relies upon information received from airborne transponders, it cannot detect the presence of aircraft whose transponders are unserviceable or which have not been selected to operate. TAs will not be produced in such circumstances, and they will not be produced in respect of any aircraft that does not carry transponder equipment, or one whose equipment is incompatible with the int ernational standard.

3.2 Limited Capability

ACAS equipments are not capable of resolving the bearing, heading or vertical rates of intruders accurately. For this reason, pilots should not attempt to manoeuvre solely on the basis of TA information (for example in IMC).

3.3 Dependence on Altitude-Reporting Transponder Equipment

As a comparison cannot be made of both the intruder and the subject aircraft's altitudes or flight levels, ACAS is not dependent on Altitude-Reporting Transponder equipment (SSR Mode C or S). However a TA will be produced, if appropriate, in these circumstances. If this should occur, flight crew should not delay making a visual search supplemented, if the potential threat cannot be seen and gives cause for concern, with a request for assistance from ATC to help them to decide whether a change of flight path should be made.

3.5 False and Nuisance TAs

ACAS may generate false and nuisance TAs under normal and safe operating conditions.

3.5.1 False TAs may occur as a result of deficiencies in the equipment or data with which it is provided.

3.5.2 Nuisance TAs may occur if aircraft flight paths are computed by ACAS to result in potential conflicts, but the advisories are perceived by flight crew to be unwarranted due to:

a) the intended change of flight path of either aircraft or,

b) the observance that adequate separation exists and that it is being maintained by both aircraft.

TAs should be treated as genuine unless the intruder has been positively identified and assessed as constituting neither a threat nor a hazard.

3.6 Operating Limits

3.6.1 ACAS will be inhibited from producing a full range of TAs in such circumstances of flight as are outside the minimum altitudes specified for operation of the equipment. For this reason , flight crew should be aware of when ACAS will not provide a full range of TA information.

3.7 ACAS II Requirements versus Helicopter Performance

3.7.1 ACAS II relies on altitude reporting information from a SSR transponder transmitting in Mode C or Mode S. The resulting altitude deviations require minimum performance criteria to resolve the Resolution Advisory generated by the ACAS II software algorithms. For example the minimum rate of closing speed below Flight Level (FL) 100 is 480 knots, and the minimum Rate of Climb or Descent (RCOD) is 1 500 ft/MIN. Helicopters and most small fixed-wing aircraft cannot comply with these performance criteria and therefore installation of ACAS II (or ACAS III) will not be mandated for these types in the future.

4 Operations Manuals and Checklists

4.1 Operations Manuals should contain, in their introduction to ACAS, information similar to that given in Section 2 above. It should be emphasised that ACAS is not to be regarded as a substitute for the visual search expected to be maintained by flight crew, nor is it intended to replace a clearance given by ATC.

4.2 Technical details of the system should at least contain brief descriptions of:

Input sources, with reference to TAs;

Audio and visual indications of TAs.

Equipment limitations.

4.3 Operational instructions should specify what checks flight crew should carry out prior to take-off to ensure that the ACAS equipment is serviceable, and the action they should take in the event that abnormal or fault conditions arise on the ground or in the air.

4.4 Minimum Equipment Lists should define a minimum despatch standard on occasions when ACAS maybe partially or fully unserviceable. In this respect full account must be taken of any appropriate legislation that may exist, and of recommendations made by the BCAA.

4.5 The Operations Manual should state clearly the actions to be taken by crews following receipt of TAs. Section 6 contains detailed guidance. Instructions should take full account of operational constraints consequent upon limitations of the equipment, such as are described in Section 3.

5 Training

5.1 The purpose for which training in the use of ACAS equipment should be provided is to ensure that pilots take appropriate action on receiving TAs.

5.2 Training should provide flight crew with information sufficient to enable them to understand the operation of ACAS equipment, including its capabilities and limitations, and the procedures they must use in response to any advisory information that may be generated.

5.3 The ground-training syllabus should include the following items:

5.3.1 Descriptions of equipment carried on board the aircraft together with associated controls, circuit protections, information displays and all audio and visual indications.

5.3.2 Abnormal or fault conditions, and such corrective or disabling actions as may be required.

5.3.3 Descriptive terms associated with ACAS, and such limitations as necessarily prevent the equipmentfrom providing total protection from approaching aircraft.

5.3.4 The full sequence of events that may follow from the time an intruder aircraft is first determined to exist until such time as, both aircraft are again proceeding on their cleared or intended courses and, if appropriate, at their assigned altitudes or flight levels. Emphasis should be placed on the need to initiate manoeuvres promptly once these are deemed necessary.

5.4 In-flight training covering full ACAS operation including demonstration TAs is impractical. If appropriate a suitably equipped flight simulator is a more desirable way of providing training in the use of ACAS equipment and of providing crew with situations in which they may practice making proper responses.

5.5 Records of training provided and competency achieved should be raised and retained for a period of 2 years.

6 Action to be taken on Receiving TAs

6.1 The purposes of a TA are to alert flight crew to the presence of an intruder aircraft, which could require a change to the flight path of the subject aircraft, and to advise them that they should attempt to sight the potential threat.

6.2 Flight crew should immediately assimilate information provided by the TA, and commence a visual search of that portion of the sky within which the potential threat should be seen. They should prepareto manoeuvre the aircraft if necessary. If the potential threat cannot be seen and gives cause for concern, flight crew should seek advice from ATC.

6.3 If the potential threat is seen and is perceived as likely to result in a definite risk of collision, pilots should manoeuvre their aircraft as necessary ensuring where possible that the sky ahead is clear of other traffic.

6.4 When clear of the potential threat and provided no other conflicts are seen to exist, the aircraft should be returned promptly to its intended flight path and ATC advised of any deviation from an air traffic control clearance.

6.5 Aircraft Management

6.5.1 Operators should emphasise that flight crew should verify to the best of their ability that the airspace in which they intend to manoeuvre is clear of other aircraft, and that they should inform ATC as soon as itis possible to do so of any departure made from an air traffic control clearance.

6.5.2 It should be understood that any deviation from an air traffic control clearance has the potential to cause disruption to the controller's tactical plan, and so might result in a reduction in separation between aircraft other than those originally involved. Therefore it is vital that crews maintain an effective look -out and that they return to their intended flight path as soon as is safe and practical to do so.

Appendix A Definitions

1 ACAS: An acronym for airborne collision avoidance systems.

1.1 ACAS I: An airborne collision avoidance system which utilizes interrogations of, and replies from, airborne radar beacon transponders. It provides traffic advisories only.

1.2 ACAS II: An airborne collision avoidance system which utilizes interrogations of, and replies from, airborne radar beacon transponders. It provides traffic advisories, and resolution advisories in the vertical plane. Requires specific minimum aircraft performance.

1.3 ACAS III: An airborne collision avoidance system which utilizes interrogations of, and replies from, airborne radar beacon transponders. It provides traffic advisories, and resolution advisories in the vertical and horizontal planes. Requires specific minimum aircraft performance.

2 TCAS: An acronym for traffic alert and collision avoidance systems having specific capabilities. TCAS has been developed in the USA to implement ACAS.

Note: When used within this document the terms 'ACAS' and 'TCAS', if not followed by numeric identifiers, are generic and refer to any ACAS 1 or TCAS 1 system respectively.

3 Protected Volume: A volume of airspace enclosing the ACAS aircraft which, when penetrated by or containing an intruder, will normally result in the generation of a traffic advisory or a resolution advisory.

4 Closest Point of Approach (CPA**):** The occurrence of minimum range between own ACAS aircraft and an intruder. Thus range at closest point of approach is the smallest range between the two aircraft, and time of closest approach is the time at which this occurs.

5 Traffic Advisory (TA): Advisory information provided by ACAS to caution flight cr ews as to the proximity of a potential threat. It should occur when the time to CPA is sensed by ACAS to have reached a set value, usually 40 seconds.

5.1 Traffic advisories aid visual acquisition, and may include range, altitude, and bearing of the poten tial threat relative to the ACAS aircraft.

5.2 Traffic advisories without altitude may also be reported from non altitude-reporting transponder Mode A-equipped potential threats.

6 Traffic: An aircraft that has come within the surveillance range of ACAS.

7 Proximate Traffic**:** An aircraft that has come within ± 1 200 ft and 6 nm of ACAS.

8 Intruder: A transponder-equipped aircraft within the surveillance range of ACAS for which ACAS has an established track.

9 Potential Threat: An intruder that has penetrated the TA-protected volume.

10 Co-ordination: The process by which two ACAS-equipped aircraft select compatible RAs by the exchange of resolution advisory complements.

12 Subject Aircraft: The ACAS-equipped aircraft that may need to manoeuvre in order to maintain adequate separation from an established threat.

13 Genuine TA: The equipment provides a TA in accordance with its technical specification.

14 Nuisance TA: The equipment provides a TA in accordance with its technical specification, but n o risk of collision exists.

15 False TA: A fault or failure in the system causes the equipment to provide a TA that is not in accordance with its technical specification.

Note: The FAA have published a list of definitions, details of which vary slightly from some of those given above. Others which are likely to be significant are shown below:

a) Alert: An indicator (visual or auditory) which provides information to flight crew in a timely manner about a non-normal situation.

b) Intruder: A target which has satisfied the traffic advisory detection criteria.

IEM OPS 3.400
Approach and Landing Conditions
See ANTR OPS 3.400

The in-flight determination of the FATO suitability should be based on the latest available report, preferably not more than 30 minutes before the expected landing time.

AMC OPS 3.420(e)
Dangerous Goods Occurrence Reporting
See ANTR OPS 3.420(e)

1 To assist the ground services in preparing for the landing of an helicopter in an emergency situation, it is essential that adequate and accurate information about any dangerous goods on board be given to the appropriate air traffic services unit. Wherever possible this information should include the proper shipping name and/or the UN/ID number, the class/division and for Class 1 the compat ibility group, any identified subsidiary risk(s), the quantity and the location on board the helicopter.

2 When it is not considered possible to include all the information, those parts thought most relevant in the circumstances, such as the UN/ID numbers or classes/divisions and quantity, should be given.

AC OPS 3.426
Flight hours reporting
(See ANTR-OPS 3.426)

The requirement of ANTR-OPS 3.426 may be achieved by making available either:

- the flight hours flown by each helicopter – identified by its serial number and registration mark -during the elapsed calendar year; or

- the total flight hours of each helicopter – identified by its serial number and registration mark – on the 31st of December of the elapsed calendar year.

Where possible, the operator should have available, for each helicopter, the breakdown of hours for CAT, aerial work,general aviation. If the exact hours for the functional activity cannot be established, the estimated proportion will be sufficient.

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AC/AMC/IEM E – ALL WEATHER OPERATIONS

AMC OPS 3.430(b)(4)
Effect on Landing Minima of temporarily failed or downgraded Ground Equipment
See ANTR OPS 3.430(b)(4)

1 Introduction

1.1 This provides operators with instructions for flight crews on the effects on landing minima of temporary failures or downgrading of ground equipment.

1.2 Aerodrome facilities are expected to be installed and maintained to the standards prescribed in ICAO Annexes 10 and 14. Any deficiencies are expected to be repaired without unnecessary delay.

2 General. These instructions are intended for use both pre-flight and in-flight. It is not expected however that the commander would consult such instructions after passing the outer marker or equivalent position. If failures of ground aids are announced at such a late stage, the approach could be continuedat the commander's discretion. If, however, failures are announced before such a late stage in the approach, their effect on the approach should be considered as described in Tables at Appendix 1 to ANTR OPS 3.430, and the approach may have to be abandoned to allow this to happen.

3 Operations with no Decision Height (DH)

3.1 The operator should ensure that, for helicopters authorised to conduct no DH operations with the lowest RVR limitations, the following applies in addition to the content of Tables at Appendix 1 to ANTR OPS 3.430.

i. RVR. At least one RVR value must be available at the aerodrome;

ii. FATO/runway lights

a. No FATO/runway edge lights, or no centre lights - Day only min RVR 200 m;

b. No TDZ lights - No restrictions;

c. No standby power to FATO/runway lights - Day only min RVR 200 m.

4. Conditions applicable to Tables at Appendix 1 to ANTR OPS 3.430

i. Multiple failures of FATO/runway lights other than indicated in Table 1B are not acceptable.

ii. Deficiencies of approach and FATO/runway lights are treated separately.

iii. Category II or III operations. A combination of deficiencies in FATO/runway lights and RVR assessment equipment is not allowed.

iv. Failures other than ILS affect RVR only and not DH.

IEM to Appendix 1 to ANTR OPS 3.430
Aerodrome Operating Minima
See Appendix 1 to ANTR OPS 3.430

The minima stated in this Appendix are based upon the experience of commonly used approach aids. This is not meant to preclude the use of other guidance systems such as Head Up Display (HUD) and Enhanced Visual Systems (EVS) but the applicable minima for such systems will need to be developed as the need arises.

IEM to Appendix 1 to ANTR OPS 3.430 subparagraph (a)(1)(i)
Onshore heliport or landing location departure procedures
See Appendix 1 to ANTR OPS 3.430 subparagraph (a)(1)(i)

The cloud base and visibility should be such as to allow the helicopter to be clear of cloud at TDP, and for the pilot flying to remain in sight of the surface until reaching the minimum speed for flight in IMC given in the HFM.

IEM to Appendix 1 to ANTR OPS 3.430 subparagraph (g)
Airborne Radar Approach (ARA) for Overwater Operations
See Appendix 1 to ANTR OPS 3.430 subparagraph (g)

1 General

1.1 The helicopter airborne radar approach procedure (ARA) may have as many as five separate segments. These are the arrival, initial, intermediate, final, and missed approach segments. In addition, the requirements of the circling manoeuvre to a landing under visual conditions should be considered. The individual approach segments can begin and end at designated fixes, however, the segments of an ARA may often begin at specified points where no fixes are available.

1.2 The fixes, or points, are named to coincide with the associated segment. For example, the intermediate segment begins at the Intermediate Fix (IF) and ends at the Final Approach Fix (FAF). Where no fix is available or appropriate, the segments begin and end at specified points; for example, Intermediate Point (IP) and final approach point (FAP). The order in which this IEM discusses the segments is the order in which the pilot would fly them in a complete procedure: that is, from the arrival through initial and intermediate to a final approach and, if necessary, the missed approach.

1.3 Only those segments which are required by local conditions applying at the time of the approach need be included in a procedure. In constructing the procedure, the final approach track, (which should be orientated so as to be substantially into wind) should be identified first as it is the least flexible and most critical of all the segments. When the origin and the orientation of the final approach have been determined, the other necessary segments should be integrated with it to produce an orderly manoeuvring pattern which does not generate an unacceptably high work-load for the flight crew.

1.4 Examples of Airborne Radar Approach procedures, vertical profile and missed approach procedures are contained in Figures 1 to 5.

2 Obstacle environment

2.1 Each segment of the ARA is located in an over-water area which has a flat surface at sea level. However, due to the passage of large vessels which are not required to notify their presence, the exact obstacle environment cannot be determined. As the largest vessels and structures are known to reach elevations exceeding 500 ft amsl, the uncontrolled offshore obstacle environment applying to the arrival, initial and intermediate approach segments can reasonably be assumed to be capable of reaching to at least 500 ft amsl. But, in the case of the final approach and missed approach segments, specific areas are involved within which no radar returns are permitted. In these areas the height of wave crests and the possibility that small obstacles may be present which are not visible on radar, results in an uncontrolled surface environment which extends to an elevation of 50 ft amsl.

2.2 Under normal circumstances, the relationship between the approach procedure and the obstacle environment is governed according to the concept that vertical separation is very easy to apply during the arrival, initial and intermediate segments, while horizontal separation, which is much more difficult to guarantee in an uncontrolled environment, is applied only in the final and missed approach segments.

3 Arrival segment

3.1 The arrival segment commences at the last en-route navigation fix, where the aircraft leaves the helicopter route, and it ends either at the Initial Approach Fix (IAF) or, if no course reversal, or similar manoeuvre is required, it ends at the IF. Standard en-route obstacle clearance criteria should be applied to the arrival segment.

4 Initial approach segment

4.1 The initial approach segment is only required if a course reversal, race track, or arc procedure is necessary to join the intermediate approach track. The segment commences at the IAF and on completion of the manoeuvre ends at the intermediate point (IP). The Minimum Obstacle Clearance (MOC) assigned to the initial approach segment is 1 000 ft.

5 Intermediate approach segment

5.1 The intermediate approach segment commences at the IP, or in the case of "straight in" approaches, where there is no initial approach segment, it commences at the IF. The segment ends at the FAP and should not be less than 2 nm in length. The purpose of the intermediate segment is to align and prepare the helicopter for the final approach. During the intermediate segment the helicopter should be lined up with the final approach track, the speed should be stabilised, the destination should be identified on t he radar, and the final approach and missed approach areas should be identified and verified to be clearof radar returns. The MOC assigned to the intermediate segment is 500 ft.

6 Final approach segment

6.1 The final approach segment commences at the FAP and ends at the missed approach point (MAPt).The final approach area, which should be identified on radar, takes the form of a corridor between the FAP and the radar return of the destination. This corridor should not be less than 2 nm wide in order that the projected track of the helicopter does not pass closer than 1 nm to the obstacles lying outside the area.

6.2 On passing the FAP, the helicopter will descend below the intermediate approach altitude, and follow a descent gradient which should not be steeper than 6·5%. At this stage vertical separation from the offshore obstacle environment will be lost. However, within the final approach area, the minimum descent height (MDH), or minimum descent altitude (MDA), will provide separation from the sur face environment. Descent from 1 000 ft amsl to 200 ft amsl at a constant 6·5% gradient will involve a horizontal distance of 2 nm. In order to follow the guideline that the procedure should not generate an unacceptably high work-load for the flight crew, the required actions of levelling at MDH, changing heading at the Offset Initiation Point (OIP), and turning away at MAPt should not be planned to occur at the same time. Consequently, the FAP should not normally be located at less than 4 nm from the destination.

6.3 During the final approach, compensation for drift should be applied and the heading which, if maintained, would take the helicopter directly to the destination, should be identified. It follows that, at an OIP located at a range of 1·5 nm, a heading change of 10° is likely to result in a track offset of 15° at 1nm, and the extended centreline of the new track can be expected to have a mean position lying some 300 - 400 metres to one side of the destination structure. The safety margin built in to the 0·75 nm Decision Range (DR) is dependent upon the rate of closure with the destination. Although the airspeed should be in the range 60/90 kt during the final approach, the ground speed, after due allowance for wind velocity, should be no greater than 70 kts.

7 Missed approach segment

7.1 The missed approach segment commences at the MAPt and ends when the helicopter reaches minimum en-route altitude. The missed approach manoeuvre is a "turning missed approach" which must be of not less than 30° and should not, normally, be greater than 45°. A turn away of more than 45° does not reduce the collision risk factor any further, nor will it permit a closer decision range (DR). However, turns of more than 45° may increase the risk of pilot disorientation and, by inhibiting the rate of climb (especially in the case of a one engine inoperative (OEI) go-around), may keep the helicopter at an extremely low level for longer than is desirable.

7.2 The missed approach area to be used should be identified and verified as a clear area on the radarscreen during the intermediate approach segment. The base of the missed approach area is a sloping surface at 2·5% gradient starting from MDH at the MAPt. The concept is that a helicopter executing a turning missed approach will be protected by the horizontal boundaries of the missed approach areauntil vertical separation of more than 130 ft is achieved between the base of the area, and the offshore obstacle environment of 500 ft amsl which prevails outside the area.

7.3 A missed approach area, taking the form of a 45° sector orientated left or right of the final approach track, originating from a point 5 nm short of the destination, and terminating on an arc 3 nm beyond the destination, will normally satisfy the requirements of a 30° turning missed approach.

8 The required visual reference

8.1 The visual reference required is that the destination shall be in view in order that a safe landing may be carried out.

9 Radar equipment

9.1 During the ARA procedure colour mapping radar equipment with a 120° sector scan and 2·5 nm range scale selected, may result in dynamic errors of the following order:

a. bearing/tracking error ± 4·5° with 95% accuracy;

b. mean ranging error - 250 m;

c. random ranging error ± 250 m with 95% accuracy.

Figure 1 - Arc Procedure

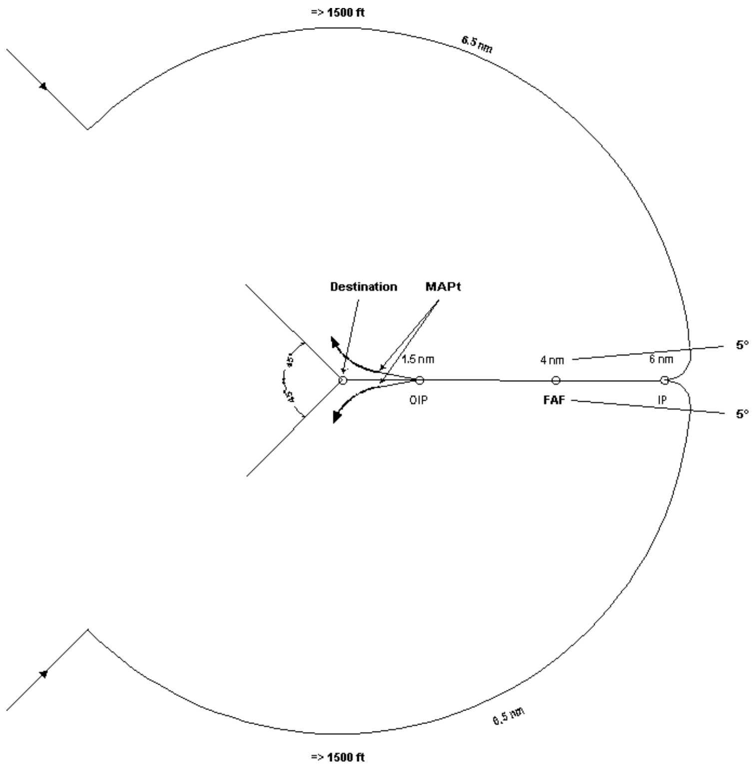


Figure 2 - Base Turn Procedure - Direct Approach

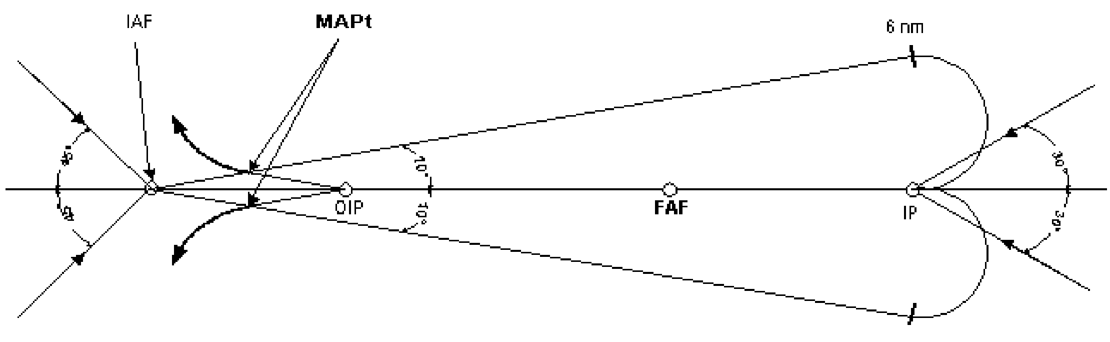


Figure 3 - Vertical Profile

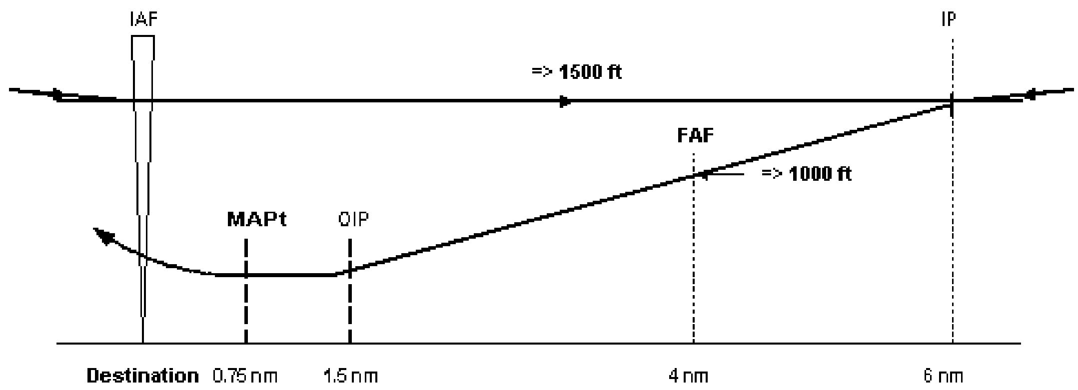


Figure 4 - Holding Pattern & Race Track Procedure

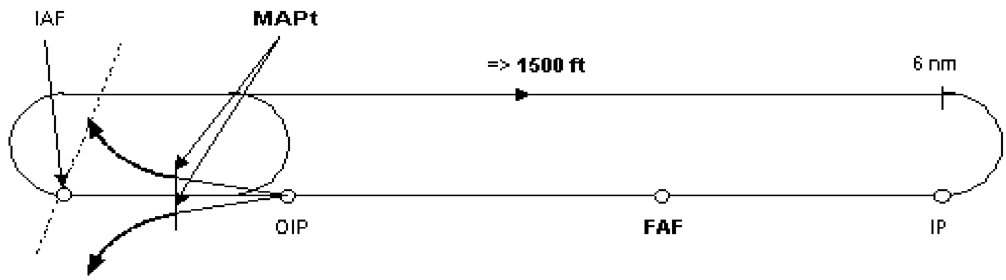
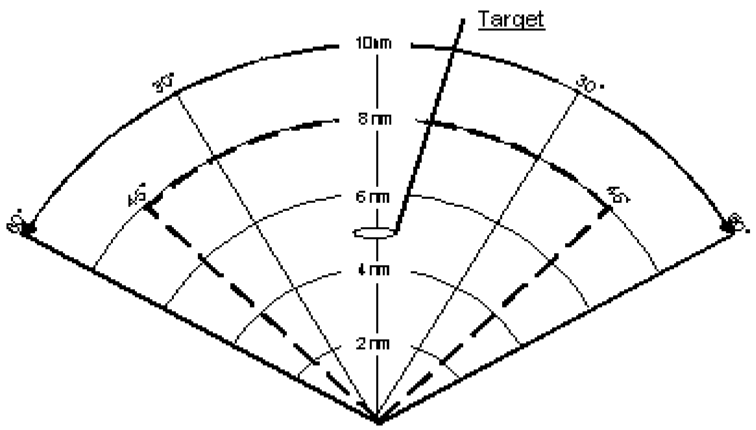


Figure 5 - Missed Approach Area Left & Right



A new Introduction based on EASA GM1 to 3 SPA.LVO.120(b)

IEM OPS 3.450
Low Visibility Operations - Training & Qualifications
See Appendix 1 to ANTR OPS 3.450

a. FLIGHT CREW TRAINING

(1) The number of approaches referred to in Paragraph VI, VII, VIII & X of Appendix 1 to ANTR 3.450 represents the minimum number of approaches that the flight crew members should conduct during initial and recurrent training and checking. More approaches or other training exercises may be required in order to ensure that flight crew members achieve the required proficiency.

(2) Where flight crew members are to be authorised to conduct more than one kind of LVOs including operations with operational credits for which the technology and operating procedures are similar, there is no requirement to increase the number of approaches in initial training if the training programme ensures that the flight crew members are competent for all operations for which they will be authorised. Where flight crew members are to be authorised to conduct more than one kind of LVOs including operations with operational credits using different technology or operating procedures, then the required minimum number of approaches should be completed for each different technology or operating procedure.

(3) Where flight crew members are authorised to conduct more than one kind of LVOs including operations with operational credits for which the technology and operating procedures are similar, then there is no requirement to increase the number of approaches flown during recurrent checking. However, where flight crew members are authorised to conduct more than one kind of LVOs including operations with operational credits using different technology or operating procedures, then the required number of approaches should be completed for each different technology or operating procedure.

(4) Flight crew members are required to complete initial FSTD training and maintain recency for each operating capacity for which they will be authorised (e.g. as pilot flying and/or pilot monitoring). A pilot who will be authorised to operate in either capacity will need to complete the minimum number of approaches in each capacity.

(5) Approaches conducted in a suitably qualified FSTD and/or during a proficiency check or demonstration of competence may be counted towards the recent experience requirements. If a flight crew member has not complied with the recent experience requirements of Paragraph I.a & I.b of Appendix 1 to ANTR OPS 1.450 , the required approaches may be conducted during recurrent training, an operator proficiency check or a periodic check of competence either in an aircraft or on an FSTD.

(6) Table 1 presents a summary of initial training requirements for LVOs and operations with operational credits.

(7) Table 2 presents a summary of recent experience and recurrent training/checking requirements for LVOs and operations with operational credits.

Table 1

Summary of initial training requirements for LVOs and operations with operational credits

Table 1

Approval	Airborne Equipment	Previous Experience	Reference	Practical FSTD trainings	LIFUS (If Required)
CAT II	Auto coupled to below DH with manual landing	none	Para VI. (a)(2)(v) of Appendix 1 to ANTR OPS 3.450	As required but not less than 6 approaches	3 landings or 1 landing¹
		Previously qualified with the same operator, similar operations³	Para VI. (b)(2)(ii) of Appendix 1 to ANTR OPS 3.450	2 approaches	none
		Previously qualified with a different EU operator, same type and variant	Para VI. (c)(2) of Appendix 1 to ANTR OPS 3.450	2 approaches	none
		Previously qualified with a different EU operator, similar operations³	Para VI. (c)(2) of Appendix 1 to ANTR OPS 3.450	2 approaches	3 landings or 1 landing
SA CAT I CAT II SA CAT II CAT III	Autoland	none	Para VI. (a)(4)(ii) of Appendix 1 to ANTR OPS 3.450	As required but not less than 6 approaches	2 landings or 1 landing¹ or no landings²
		Previously qualified with the same operator, similar operations³	Para VI. (b)(3)(ii) of Appendix 1 to ANTR OPS 3.450	2 approaches	None
		Previously qualified with a different EU operator, same type and variant	Para VI. (c)(2) of Appendix 1 to ANTR OPS 3.450	2 approaches	none
		Previously qualified with a different EU operator, similar operations³	Para VI. (c)(2) of Appendix 1 to ANTR OPS 3.450	2 approaches	2 landings or 1 landing¹ or no landings²
CAT II SA CAT II CAT III	HUDLS/ manual landing	none	Para VI. (a)(2)(v) of Appendix 1 to ANTR OPS 3.450	As required but not less than 8 approaches	4 landings or 2 landings¹
		Previously qualified with the same operator, similar operations³	Para VI. (b)(3)(i) of Appendix 1 to ANTR OPS 3.450	4 approaches	None
		Previously qualified with a different EU operator, same type and variant	Para VI. (c)(2) of Appendix 1 to ANTR OPS 3.450	4 approaches	none

		Previously qualified with a different EU operator, similar operations³	Para VI. (c)(2) of Appendix 1 to ANTR OPS 3.450	4 approaches	4 landings or 2 landings¹
SA CAT I CAT II SA CAT II CAT III	HUDLS/ automatic landing	none	Para VI. (a)(4) of Appendix 1 to ANTR OPS 3.450	As required but not less than 8 approaches	2 landings or 1 landing¹ or no landings²
		Previously qualified with the same operator, similar operations³	Para VI. (b)(3) of Appendix 1 to ANTR OPS 3.450	4 approaches	None
		Previously qualified with a different EU operator, same type and variant	Para VI. (c)(2) of Appendix 1 to ANTR OPS 3.450	4 approaches	None
		Previously qualified with a different EU operator, similar operations³	Para VI. (c)(2) of Appendix 1 to ANTR OPS 3.450	4 approaches	2 landings or 1 landing¹ or no landings²
~~EFVS-A~~ EVS - Approach	EFVS with HUD/ HUDLS	none	Para VII. (a)(2) of Appendix 1 to ANTR OPS 3.450	As required but not less than 8 approaches	3 landings
		Previously qualified with the same operator, similar operations³	Para VII. (b)(3) of Appendix 1 to ANTR OPS 3.450	2 approaches	None
		Previously qualified with a different EU operator, same type and variant	Para VII. (c)(2) of Appendix 1 to ANTR OPS 3.450	2 approaches	none
		Previously qualified with a different EU operator, similar operations³	Para VII. (c)(2) of Appendix 1 to ANTR OPS 3.450	2 approaches	3 landings
EFVS-L	EFVS with HUD/ HUDLS	none	Para VII. (a)(2) of Appendix 1 to ANTR OPS 3.450	As required but not less than 8 approaches	4 landings
		Previously qualified with the same operator, similar operations³	Para VII. (b)(3) of Appendix 1 to ANTR OPS 3.450	4 approaches	None
		Previously qualified with a different EU operator, same type and variant	Para VII. (c)(2) of Appendix 1 to ANTR OPS 3.450	4 approaches	none
		Previously qualified with a different EU operator, similar operations³	Para VII. (c)(2) of Appendix 1 to ANTR OPS 3.450	4 approaches	4 landings

Notes:

1: Fewer landings during LIFUS are required if a level 'D' FSTD is used for conversion training.
2: No landings are required if a candidate has completed the zero flight-time (ZFT) type rating.
3: 'Similar operations' implies that the level of technology, operating procedures, handling characteristics and HUD/HUDLS or equivalent display systems are the same or similar.
4: 'operational suitability data established in accordance with ANTR OPS 3 / ANTR FCL 1

may define credits'

Table 2 Summary of recent experience and recurrent training/checking requirements for LVOs and operations with operational credits

LVO / Operational Credit	Airborne Equipment	Recent Experience [1,2]	Reference	Recurrent Training / Checking	Reference
LVTO	-	-	-	1 rejected take-off and 1 LVTO at minimum RVR[1]	Para VIII. (a)(1), (a)(2) of Appendix 1 to ANTR OPS 3.450
CAT II	Auto coupled below DH with manual landing	2 or more approaches[4]	Para III. (a) & (b) of Appendix 1 to ANTR OPS 3.450	1 approach to land; 1 approach to go-around	Para VIII. (a)(2) & (a)(3) of Appendix 1 to ANTR OPS 3.450
SA CAT I CAT II SA CAT II CAT III	Autoland				
CAT II/III SA CAT I SA CAT II	HUDLS/ manual landing	2 or 4 approaches	Para III. (c) of Appendix 1 to ANTR OPS 3.450	2 approaches including a landing	Para VIII. (b) of Appendix 1 to ANTR OPS 3.450
CAT II/III SA CAT I SA CAT II	HUDLS/ automatic landing				
Approach using EFVS	(HUD/ HUDLS)	2 approaches[4]	Para II of Appendix 1 to ANTR OPS 3.450	2 approaches[3]	Para X of Appendix 1 to ANTR OPS 3.450

Notes:
1: LVTO only required if the minimum approved RVR is less than 150 m.
2: If a flight crew member is authorised to operate as pilot flying and pilot monitoring, then the flight crew member should complete the required number of approaches in each operating capacity.
3: One approach to be flown without natural vision, to the height below which an approach should not be continued if natural visual reference is not acquired.
4: 'operational suitability data established in accordance with ANTR OPS 3 / ANTR FCL 1
may define credits'

b. RECURRENT TRAINING AND CHECKING FOR EFVS OPERATIONS

In order to provide the opportunity to practise decision-making in the event of system failures and failure to acquire natural visual reference, the recurrent training and checking for EFVS / EVS operations is recommended to periodically include different combinations of equipment failures, go-around due to loss of visual reference and landings.

c. INITIAL TRAINING AND CHECKING FOR SA CAT I, CAT II, SA CAT II AND CAT III APPROACH OPERATIONS

The ground training referred to in points (1)(i)(a) and (d) of Para II.b of Appendix 1 to ANTR OPS 3.450 may include:

(1) airborne and ground equipment:

(i) technical requirements;

(ii) operational requirements;

(iii) operational reliability;

(iv) fail-operational;

(v) fail-passive;

(vi) equipment reliability;

(vii) operating procedures;

(viii) preparatory measures;

(ix) operational downgrading; and

(x) communications; and

(2) procedures and limitations:

(i) operating procedures; and

(ii) crew coordination.

AC OPS 3.465
Minimum Visibility for VFR Operations
See ANTR OPS 3.465

When flight with a visibility of less than 5 km is permitted, the forward visibility should not be less than the distance travelled by the helicopter in 30 seconds so as to allow adequate opportunity to see and avoid obstacles (see table below).

Visibility (m)	Advisory speed (kts)
800	50
1 500	100
2 000	120

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AC/AMC/IEM F – PERFORMANCE GENERAL

AC OPS 3.475(c)(3)(ii)
Head-wind component for take-off and the take-off flight path
See ANTR-OPS 3.475(c)(3)(ii)

When considering approving the use of reported wind components in excess of 50% for take-off and the take-off flight path the following should be considered:

1 The proximity to the FATO, and accuracy enhancements, of the wind measuring equipment; and

2 The existence of appropriate procedures in a supplement to the Flight Manual; and

3 The establishment of a safety case.

AC OPS 3.480(a)(1) and (a)(2)
Category A and Category B
See ANTR OPS 3.480(a)(1) and (a)(2)

See ANTR-OPS 3.485

See ANTR-OPS 3.515(a)

See ANTR-OPS 3.540(a)(1)

1 Helicopters which have been certificated according to any of the following standards are considered to satisfy the Category A criteria of ANTR OPS 3.480(a)(1). Provided that they have the necessary performance information scheduled in the Flight Manual, such helicopters are therefore eligible for Performance Class 1 or 2 operations:

a. Certification as Category A under CFR 14 PART 27 /CS-27 or CFR 14 PART 29 / CS-29;

~~b. Certification as Category A under FAR Part 29;~~

c. Certification as Group A under BCAR Section G;

d. Certification as Group A under BCAR- 29;

2 In addition to the above, certain helicopters have been certificated under ~~FAR~~ CFR 14 Part 27 and with compliance with ~~FAR~~ CFR 14 Part 29 engine isolation requirements as specified in FAA Advisory Circular AC 27-1. These helicopters may be accepted as eligible for Performance Class 1 or 2 operations provided that compliance is established with the following additional requirements of CS-29 or equivalent:

CS 29.1027(a)	Independence of engine and rotor drive system lubrication.
CS 29.1187(e)	
CS 29.1195(a) & (b)	Provision of a one-shot fire extinguishing system for each engine.
CS 29.1197	
CS 29.1199	
CS 29.1201	
CS 29.1323(c)(1)	Ability of the airspeed indicator to consistently identify the take-off decision point.

Note: The requirement to fit a fire extinguishing system may be waived if the helicopters manufacturer can demonstrate equivalent safety, based on service experience for the entire fleet showing that the actual incidence of fires in the engine fire zones has been negligible.

3 The OPS Part 3 performance operating rules of Subparts G, H and I were drafted in conjunction with the performance requirements of CS-29 and ~~FAR Part 29~~ CFR 14 PART 29 at Amendment 29-39. For helicopters certificated under ~~FAR Part 29~~ CFR 14 PART 29 at an earlier amendment, or under BCAR Section G or BCAR- 29,performance data will have been scheduled in the Helicopter Flight Manual according to these earlier requirements. This earlier scheduled data may not be fully compatible with the OPS Part 3 rules. Before Performance Class 1 or 2 operations are approved, it should be established that scheduled performance data is available which is compatible with the requirements of Subparts G or H respectively.

4 Any properly certificated and appropriately equipped helicopter is considered to satisfy the Category B criteria of ANTR OPS 3.480(a)(2). Such helicopters are therefore eligible for Performance Class 3 operations.

IEM OPS 3.480(a)(15)
Terminology - Hostile environment
See ANTR OPS 3.480(a)(15)

Those open sea areas considered to constitute a hostile environment are designated by the BCAA in the appropriate Aeronautical Information Publication or other suitable documentation.

AC OPS 3.480(a)(31)
The application of TODRH
See ANTR-OPS 3.480(a)(32)

1. DISCUSSION

Original definitions for helicopter performance were derived from aeroplanes; hence the definition of takeoff distance owes much to operations from runways. Helicopters on the other hand can operate from runways, confined and restricted areas and rooftop heliports or landing locations - all bounded by obstacles. As an analogy this is equivalent to a take-off from a runway with obstacles on and surrounding it.

It can therefore be seen that unless the original definitions from aeroplanes are tailored for helicopters, the flexibility of the helicopter might be constrained by the language of operational performance.

This paper concentrates on the critical term - Take-off Distance Required (TODRH) - and describes the methods to achieve compliance with it and, in particular, the alternative procedure described in ICAO Annex 6 Attachment A 4.1.1.2(b):

The take-off distance required does not exceed the takeoff distance available; or

As an alternative, the take-off distance required may be disregarded provided that the helicopter with the critical power-unit failure at the TDP can, when continuing the take-off, clear all obstacles between the end of the take-off distance available and the point at which it becomes established in a climb at VTOSS by a vertical margin of 10.7 m (35 ft) or more. An obstacle is considered to be in the path of the helicopter if its distance from the nearest point on the surface below the intended line of flight does not exceed 30 m or 1.5 times the maximum dimension of the helicopter, whichever is greater.

2. DEFINITION OF TODRH

The definition of TODRH from ANTR-OPS 3.480(a)(31) is as follows:

(31) Take-off distance required (TODRH). The horizontal distance required from the start of the take-off to the point at which VTOSS, a selected height, and a positive climb gradient are achieved, following failure of the critical power-unit being recognised at TDP, the remaining power-unit(s) operating within approved operating limits. The selected height is to be determined with the use of Helicopter Flight Manual data, and is to be at least 10.7 m (35 ft) above:

(i) the take-off surface; or

(ii) as an alternative, a level defined by the highest obstacle in the take-off distance required.

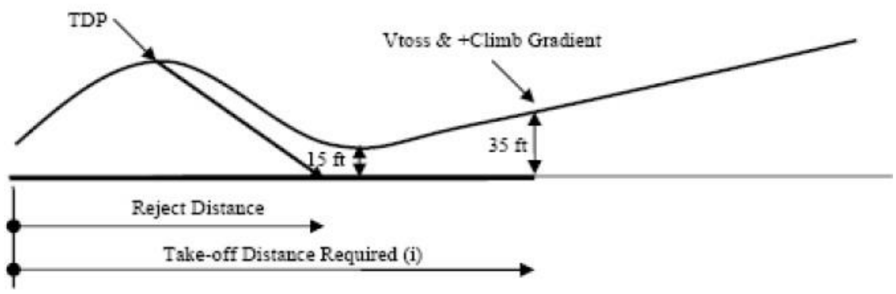
The original definition of TODRH was based only on the first part of this definition.

3. THE CLEAR AREA PROCEDURE (RUNWAY)

In the past, helicopters certificated in Category A would have had, at the least, a ‘clear area’ procedure. This procedure is analogous to an aeroplane Category A procedure and assumes a runway (either metalled or grass) with a smooth surface suitable for an aeroplane take-off (see Figure 1).

The helicopter is assumed to accelerate down the FATO (runway) outside of the HV diagram. If the helicopter has an engine failure before TDP, it must be able to land back on the FATO (runway) without damage to helicopter or passengers; if there is a failure at or after TDP the aircraft is permitted to lose height - providing it does not descend below a specified height above the surface (usually 15 ft if the TDP is above 15 ft). Errors by the pilot are taken into consideration but the smooth surface of the FATO limits serious damage if the error margin is eroded (e.g. by a change of wind conditions).

Figure 1 - Clear Area take-off



The operator only has to establish that the distances required are within the distance available (take-off distance and reject distance). The original definition of TODRH meets this case exactly.

From the end of the TODRH obstacle clearance is given by the climb gradient of the first or second climb segment meeting the requirement of ANTR-OPS 3.495 (or for PC2 - ANTR-OPS 3.525). The clearance margin from obstacles in the take-off flight path takes account of the distance travelled from the end of the takeoff distance required and operational conditions (IMC or VMC).

4. CATEGORY A PROCEDURES OTHER THAN CLEAR AREA

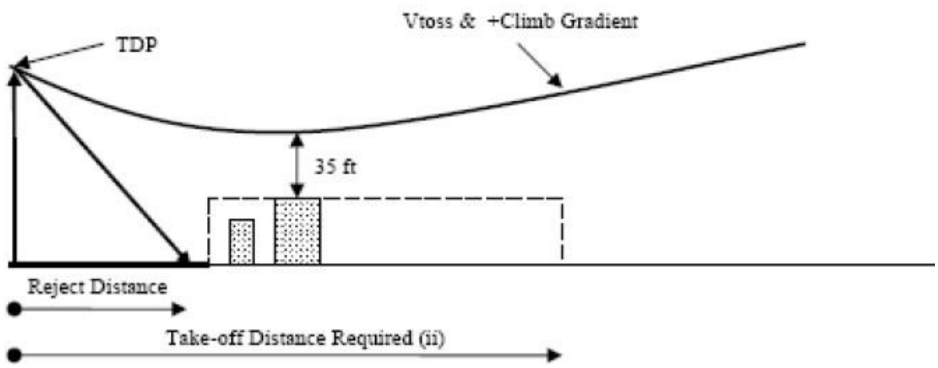
Procedures other than the clear area are treated somewhat differently. However, the short field procedure is somewhat of a hybrid as either part of the definition of TODRH can be utilised (the term ‘helipad’ is used in the following section to illustrate the principle only - it is not intended as a replacement for ‘heliport’ or ‘landing location’).

4.1 Limited area, restricted area and helipad procedures (other than elevated)

The exact names of the procedure used for other than clear area are as many as there are manufacturers. However, principles for obstacle clearance are generic and the name is unimportant.

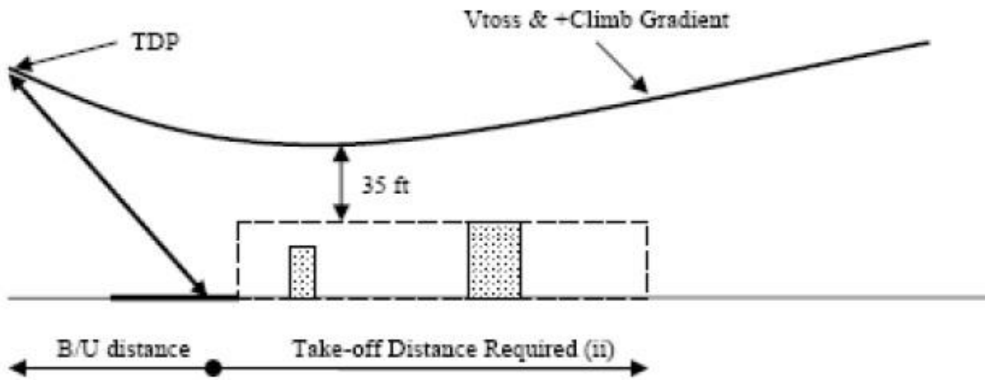
These procedures (see Figure 2 and Figure 3) are usually associated with an obstacle in the continued take-off area - usually shown as a line of trees or some other natural obstacle. As clearance above such obstacles is not readily associated with an accelerative procedure, as described in 3 above, a procedure using a vertical climb (or a steep climb in the forward, sideways or rearward direction) is utilised.

Figure 2 - Short Field take-off



With the added complication of a TDP principally defined by height together with obstacles in the continued take off area, a drop down to within 15 ft of the take-off surface is not deemed appropriate and the required obstacle clearance is set to 35 ft (usually called min-dip). The distance to the obstacle does not need to be calculated (provided it is outside the rejected distance required), as clearance above all obstacles is provided by ensuring that helicopter does not descend below the min-dip associated with a level defined by the highest obstacle in the continued take-off area.

Figure 3 - Helipad take-off



These procedures depend upon the alternative definition of TODRH.

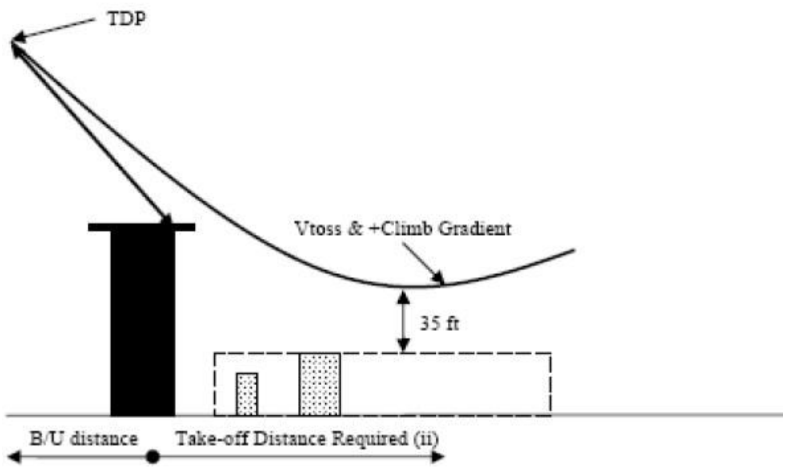
As shown in Figure 3, the point at which Vtoss and a positive rate of climb are met defines the TODRH. Obstacle clearance from that point is assured by meeting the requirement of ANTR-OPS 3.495 (or for PC2 -ANTR-OPS 3.525).

Also shown in Figure 3 is the distance behind the helipad which is the back-up distance (B/U distance).

4.2 Elevated helipad procedures

The elevated helipad procedure (see Figure 4) is a special case of the ground level helipad procedure discussed above.

Figure 4 - Elevate Helipad take-off



The main difference is that drop down below the level of the take-off surface is permitted. In the drop down phase, the Category A procedure ensures deck-edge clearance but, once clear of the deck-edge, the 35 ft clearance from obstacles relies upon the calculation of drop down. The alternative definition of the TODRH is applied.

Note: *35ft may be inadequate at particular elevated heliports which are subject to adverse airflow effects, turbulence, etc.*

AC/AMC/IEM G – PERFORMANCE CLASS 1

AC OPS 3.490(d)
Obstacle Clearance in the Back-up Area
(See ANTR-OPS 3.490(d))

The requirement in ANTR-OPS 3.490(d) has been established in order to take into account the following factors:

In the back-up; the pilot has few visual cues and has to rely upon the altimeter and sight picture through the front window (if flight path guidance is not provided) to achieve an accurate rearward flight path.

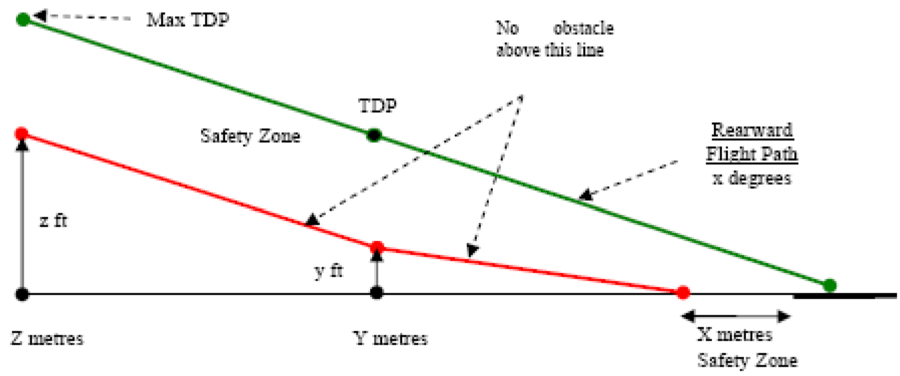
In the rejected take-off; the pilot has to be able to manage the descent against a varying forward speed whilst still ensuring an adequate clearance from obstacles until the helicopter gets in close proximity for landing on the FATO.

In the continued take-off; the pilot has to be able to accelerate to Vtoss whilst ensuring an adequate clearance from obstacles.

The requirements of ANTR-OPS 3.490(d) may be achieved by establishing that, in the backup area:

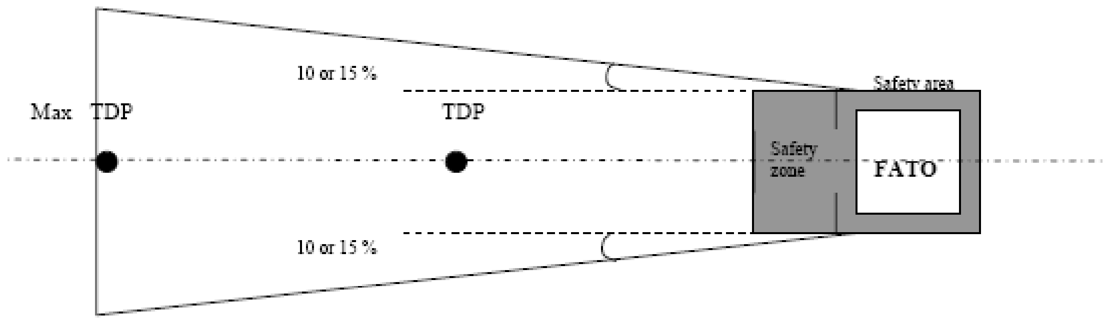
- no obstacles are located within the safety zone below the rearward flight path when described in the helicopter flight manual (see figure 1); (in the absence of such data in the helicopter flight manual, the operator should contact the manufacturer in order to define a safety zone);or
- during the backup, the rejected take-off and the continued take-off manoeuvres, obstacle clearance has been demonstrated by a means acceptable to the BCAA.

Figure 1 – rearward flight path



An obstacle, in the backup area, is considered if its lateral distance from the nearest point on the surface below the intended flight path is not further than half of the minimum FATO (or the equivalent term used in the Flight Manual) width defined in the Helicopter Flight Manual (or, when no width is defined 0.75 D), plus 0.25 times D (or 3m, whichever is greater); plus 0.10 for VFR day, or 0.15 for VFR night, of the distance travelled from the back of the FATO. (see figure 2).

Figure 2 – Obstacle accountability



AC OPS 3.490 & 3.510
Application for alternative take-off and landing procedures

Discussion

A manufacturer's Category A procedure defines profiles and scheduled data for take-off, climb, performance at minimum operating speed and landing, under specific environmental conditions and masses.

Associated with these profiles and conditions are minimum operating surfaces, take-off distances, climb performance and landing distances; these are provided (usually in graphic form) with the take-off and landing masses and the Take-off Decision Point (TDP) and Landing Decision Point (LDP).

The landing surface and the height of the TDP are directly related to the ability of the helicopter – following a power-unit failure before or at TDP - to reject onto the surface under forced landing conditions. The main considerations in establishing the minimum size of the landing surface are the scatter during flight testing of the reject manoeuvre, with the remaining engine operating within approved limits, and the required usable cue environment.

Hence an elevated site with few visual cues - apart from the surface itself - would require a greater surface area in order that the helicopter can be accurately positioned during the reject manoeuvre within the specified area. This usually results in the stipulation of a larger surface for an elevated site than for a ground level site (where lateral cues may be present).

This could have the unfortunate side-effect that a heliport or landing location which is built 3m above the surface (and therefore elevated by definition) might be out of operational scope for some helicopters - even though there might be a rich visual cue environment where rejects are not problematical. The presence of elevated sites where ground level surface requirements might be more appropriate could be brought to the attention of the BCAA.

It can be seen that the size of the surface is directly related to the requirement of the helicopter to complete a rejected take-off following a power-unit failure. If the helicopter has sufficient power such that a failure before or at TDP will not lead to a requirement for rejected take-off, the need for large surfaces is removed; sufficient power for the purposeof this AC is considered to be the power required for hoverout-of-ground-effect (HOGE) one-engine-inoperative (OEI).

Following a power-unit failure at or after the TDP, the continued take-off path provides OEI clearance from the take-off surface and the distance to reach a point from where climb performance in the first, and subsequent segments, is assured.

If HOGE OEI performance exists at the height of the TDP, it follows that the continued take-off profile, which has been defined for a helicopter with a mass such that a rejected take-off would be required following a power-unit failure at or before TDP, would provide the same, or better, obstacle clearance and the same, or less, distance to reach a point where climb performance in the first, and subsequent segments, is assured.

If the TDP is shifted upwards, provided that the HOGE OEI performance is established at the revised TDP, it will not affect the shape of the continued take-off profile but should shift the min-dip upwards by the same amount that the revised TDP has been increased - with respect to the basic TDP.

Such assertions are concerned only with the vertical or the back-up procedures and can be regarded as achievable under the following circumstances:

1 When the procedure is flown, it is based upon a profile contained in the Helicopter Flight Manual (HFM) - with the exception of the necessity to perform a rejected take-off.

2 The HOGE OEI performance is specified as in AC 29-2C, MG 12 for the Human External Cargo (HEC) Class D requirements.

3 The TDP, if shifted upwards (or upwards and backward in the back-up procedure) will be the height at which the HOGE OEI performance is established.

4 If obstacles are permitted in the back-up area they should continue to be permitted with a revised TDP.

Methods of Application:

The operator may apply to the BCAA for a reduction in the size of the take-off surface under the following conditions:

Compliance with the requirements of ANTR-OPS 3.490, 3.495 and 3.510 can be assured with:

1 a procedure based upon an appropriate Category A take-off and landing profile scheduled in the HFM;

2 a take-off or landing mass not exceeding the mass scheduled in the HFM for a HOGE OEI in compliance with HEC Class D performance requirements ensuring that:

2.1 following a power-unit failure at or before TDP, there are adequate external references to ensure that the helicopter can be landed in a controlled manner; and

2.2 following a power-unit failure at or after the LDP there are adequate external references to ensure that the helicopter can be landed in a controlled manner.

The operator may apply to the BCAA for an upwards shift of the TDP and LDP under the following conditions:

Compliance with the requirements of ANTR-OPS 3.490, 3.495 and 3.510 can be assured with:

3 a procedure based upon an appropriate Category A take-off and landing profile scheduled in the HFM;

4 a take-off or landing mass not exceeding the mass scheduled in the HFM for a HOGE OEI in compliance with HEC Class D performance requirements ensuring that:

4.1 following a power-unit failure at or after TDP compliance with the obstacle clearance requirements of ANTR-OPS 3.490(a)(2)(iv) and ANTR-OPS 3.495 can be met; and

4.2 following a power-unit failure at or before the LDP the balked landing obstacle clearance requirements of ANTR-OPS 3.510(a)(2) and ANTR-OPS 3.495 can be met.

Alternatively, the operator may apply to the BCAA for the use of the Category A ground level surface requirement for a specific elevated heliport or landing location when it can be demonstrated that the usable cue environment at that heliport or landing location would permit such a reduction.

AC OPS 3.500(b)(3)
En-route - critical power unit inoperative (fuel jettison)
See ANTR OPS 3.500(b)(3).

The presence of obstacles along the en-route flight path may preclude compliance with ANTR OPS 3.500(a)(1) at the planned mass at the critical point along the route. In this case fuel jettison at the most critical point may be planned, provided that the procedures in AMC OPS 3.255 paragraph 3 are complied with.

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AC/AMC/IEM H – PERFORMANCE CLASS 2

AC to Subpart H
Operations in Performance Class 2
See Subpart H

1. INTRODUCTION

This paper describes Performance Class 2 as established in ANTR-OPS 3, Subpart H. It has been produced for the purpose of:

a. discussing the underlying philosophy of Operations in Performance Class 2;

b. showing simple methods of compliance; and

c. explaining how to determine - with examples and diagrams:

- the take-off and landing masses;

- the length of the safe-forced-landing area;

- distances to establish obstacle clearance; and

- entry point(s) into Performance Class 1.

It discusses the derivation of Performance Class 2 from ICAO Annex 6 Part III and describes an alleviation which may be approved following a Risk Assessment.

It reproduces relevant definitions; examines the basic requirements; discusses the limits of operation; and considers the benefits of the use of Performance Class 2.

It contains examples of Performance Class 2 in specific circumstances, and explains how these examples may be generalised to provide the operators with methods of calculating landing distances and obstacle clearance.

2. DEFINITIONS

To assist in the reading of this paper, definitions from ANTR-OPS 3, Subpart F have been reproduced:

Distance DR. DR is the horizontal distance that the helicopter has travelled from the end of the take-off distance available.

Defined point after take-off (DPATO). The point, within the take-off and initial climb phase, before which the helicopter's ability to continue the flight safely, with the critical power unit inoperative, is not assured and a forced landing may be required.

Defined point before landing (DPBL). The point within the approach and landing phase, after which the helicopter's ability to continue the flight safely, with the critical power unit inoperative, is not assured and a forced landing may be required.

Landing distance available (LDAH). The length of the final approach and take-off area plus any additional area declared available and suitable for helicopters to complete the landing manoeuvre from a defined height.

Landing distance required (LDRH). The horizontal distance required to land and come to a full stop from a point 15m (50ft) above the landing surface.

Performance Class 2. Performance Class 2 operations are those operations such that, in the event of critical power unit failure, performance is available to enable the helicopter to safely continue the flight, except when the failure occurs early during the take-off manoeuvre or late in the landing manoeuvre, in which cases a forced landing may be required.

Safe forced landing. Unavoidable landing or ditching with a reasonable expectancy of no injuries to persons in the aircraft or on the surface.

Take-off distance available. The length of the final approach and take-off area plus the length of any clearway (if provided) declared available and suitable for helicopters to complete the take-off.

The following terms, which are not defined in ANTR-OPS 3 Subpart F, are used in the following text:

V_T. A target speed at which to aim at the point of minimum ground clearance (min-dip) during acceleration from TDP to Vtoss.

V_{50}. A target speed and height utilised to establish a Flight Manual distance (in compliance with the requirement of CS 29.63) from which climbout is possible.

$V_{stay-up}$. A colloquial term used to indicate a speed at which a descent would not result following a powerunit failure. This speed is several knots lower than Vtoss at the equivalent take-off mass.

3. WHAT DEFINES PERFORMANCE CLASS 2

Performance Class 2 can be considered as Performance Class 3 take-off or landing, and Performance Class 1 climb, cruise and descent. It comprises an All Engines Operating (AEO) obstacle clearance regime for the take-off or landing phases, and a One Engine Inoperative (OEI) obstacle clearance regime for the climb, cruise, descent, approach and missed approach phases.

Note: For the purpose of performance calculations in ANTR-OPS 3, the CS 29.67 Category A climb performance criteria is used:

- 150 ft/min at 1,000 ft (at Vy);

and depending on the choice of DPATO:

- 100 ft/min up to 200 ft (at Vtoss)

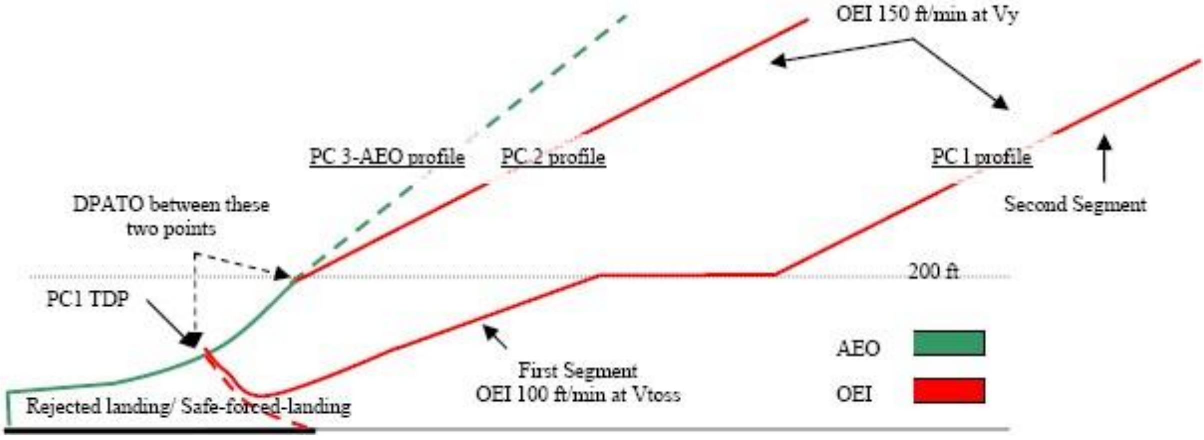
at the appropriate power settings.

3.1 Comparison of obstacle clearance in all Performance Classes

Figure 2 shows the profiles of the three Performance Classes - superimposed on one diagram.

Performance Class 1 (PC 1); from TDP, requires OEI obstacle clearance in all phases of flight; the construction of Category A procedures, provides for a flight path to the first climb segment, a level acceleration segment to Vy which may be shown concurrent with the first segment), followed by the second climb segment from Vy at 200 ft (see Figure 1).

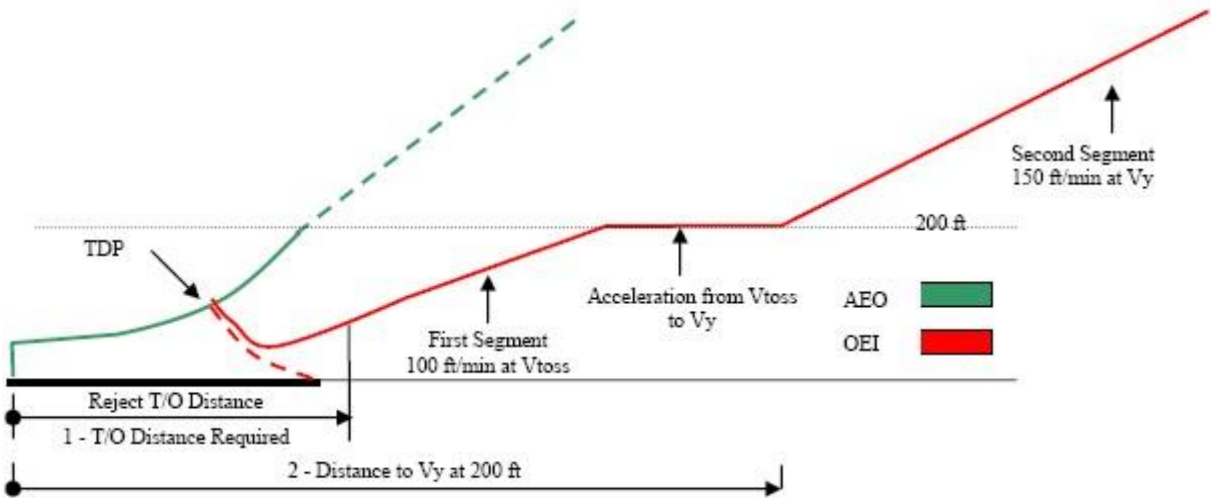
Figure 1 - All Performance Classes (a comparison)



- Performance Class 2 (PC 2); requires AEO obstacle clearance to DPATO and OEI from then on. The take-off mass has the PC 1 second segment climb performance at its basis therefore, at the point where Vy at 200 ft is reached, Performance Class 1 is achieved (see also Figure 3).

- Performance Class 3 (PC 3); requires AEO obstacle clearance in all phases.

Figure 2 - Performance Class 1 distances



3.2 Comparison of the discontinued take-off in all Performance Classes

- PC 1 - requires a prepared surface on which a rejected landing can be undertaken (no damage); and

- PC 2 and 3 - require a safe-forced-landing surface (some damage can be tolerated but there must be a reasonable expectancy of no injuries to persons in the aircraft or third parties on the surface).

4. THE DERIVATION OF PERFORMANCE CLASS 2

Subpart H - PC 2 is primarily based on the the text of ICAO Annex 6 Part III Section II and its attachments which provide for the following:

a. Obstacle clearance before DPATO; the helicopter shall be able, with all engines operating, to clear all obstacles by an adequate margin until it is in a position to comply with b. below.

b. Obstacle clearance after DPATO; the helicopter shall be able, in the event of the critical powerunit becoming inoperative at any time after reaching DPATO, to continue the take-off clearing all obstacles along the flight path by an adequate margin until it is able to comply with en-route clearances.

c. Engine failure before DPATO; before the DPATO, failure of the critical power-unit may cause the helicopter to force land; therefore a safe-forced-landing should be possible (this is analogous to the requirement for a reject in Performance Class 1 but where some damage to the helicopter can be tolerated.)

5. BENEFITS OF ANTR-OPS 3 PERFORMANCE CLASS 2

Operations in Performance Class 2 permit advantage to be taken of an all-engines-operating (AEO) procedure for a short period during take-off and landing - whilst retaining engine failure accountability in the climb, descent and cruise. The benefits include:

- Ability to use (the reduced) distances scheduled for the AEO - thus permitting operations to take place at smaller heliports or landing locations and allowing airspace requirements to be reduced.

- Ability to operate when the safe-forced-landing distance available is located outside the boundary of the heliport or landing location.

- Ability to operate when the take-off-distance required is located outside the boundary of the heliport or landing location.

- Ability to use existing Category A profiles and distances when the surface conditions are not adequate for a reject but are suitable for a safe-forced-landing (for example when the ground is waterlogged).

Additionally, following a Risk Assessment when the use of exposure is permitted by the BCAA:

- Ability to operate when a safe-forced landing is not assured in the take-off phase.

- Ability to penetrate the HV curve for short periods during take-off or landing.

6 IMPLEMENTATION OF PERFORMANCE CLASS 2 IN ANTR-OPS 3

The following sections discuss the principles of the implementation of Performance Class 2.

6.1 Does ICAO spell it all out?

ICAO Annex 6 does not give guidance on how DPATO should be calculated nor does it require that distances be established for the take-off. However, it does require that, up to DPATO AEO, and from DPATO OEI, obstacle clearance is established (see Figure 3 and Figure 4 which are simplified versions of the diagrams contained in Annex 6 Part III, Attachment A).

Note: Annex 8 – Airworthiness of Aircraft (Part IV, Chapter 2.2.1.3.4) requires that an AEO distance be scheduled for all helicopters operating in Performance Classes 2 & 3. Annex 6 is dependent upon the scheduling of the AEO distances, required in Annex 8, to provide data for the location of DPATO.

When showing obstacle clearance, the divergent obstacle clearance height required for IFR is as in Performance Class 1 - achieved by the application of the additional obstacle clearance of 0.01 DR (DR = the distance from the end of 'take-off-distance-available' - see the pictorial representation in Figure 4 and the definition in section 2. above).

As can also be seen from Figure 4, flight must be conducted in VFR until DPATO has been achieved (and deduced that if an engine failure occurs before DPATO, entry into IFR is not permitted (as the OEI climb gradient will not have been established)).

Figure 3 - Performance Class 2 Obstacle Clearance

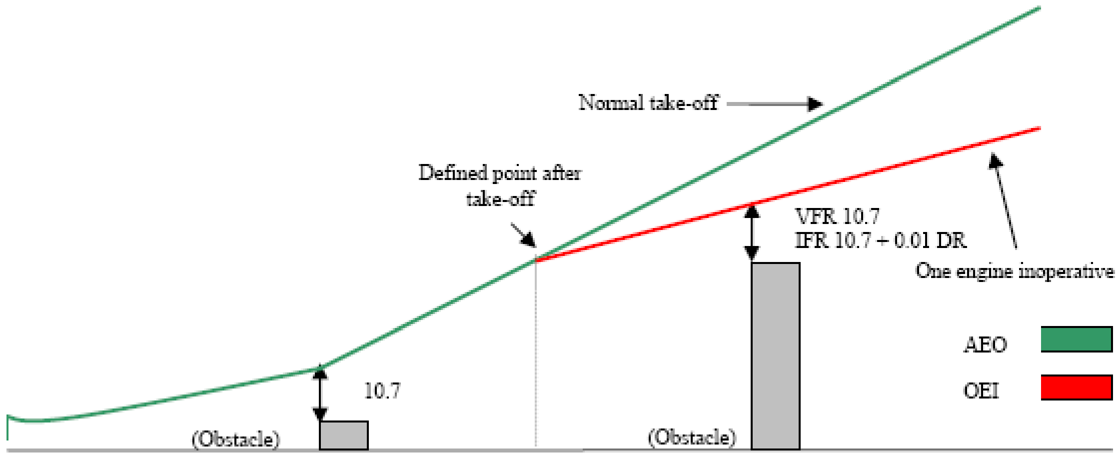
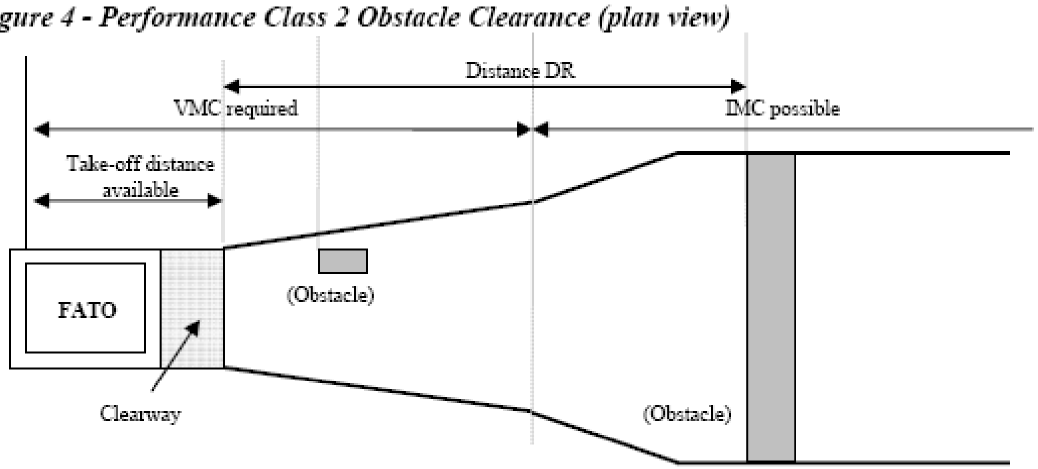


Figure 4 - Performance Class 2 Obstacle Clearance (plan view)



6.2 Function of DPATO

From the preceding paragraphs it can be seen that DPATO is germane to PC 2. It can also be seen that, in view of the many aspects of DPATO, it has, potentially, to satisfy a number of requirements which are not necessarily synchronised (nor need to be).

It is clear that it is only possible to establish a single point for DPATO, satisfying the requirement of 4 b & 4 c above, when:

- accepting the TDP of a Category A procedure; or

- extending the safe-forced-landing requirement beyond required distances (if data is available to permit the calculation of the distance for a safe-forced-landing from the DPATO).

It could be argued that the essential requirement for DPATO is contained in section 4 b - OEI obstacle clearance. From careful examination of the flight path reproduced in Figure 3 above, it may be reasonably deduced that DPATO is the point at which adequate climb performance is established (examination of Category A procedures would indicate that this could be (in terms of mass, speed and height above the take-off surface) the conditions at the start of the first or second segments - or any point between.)

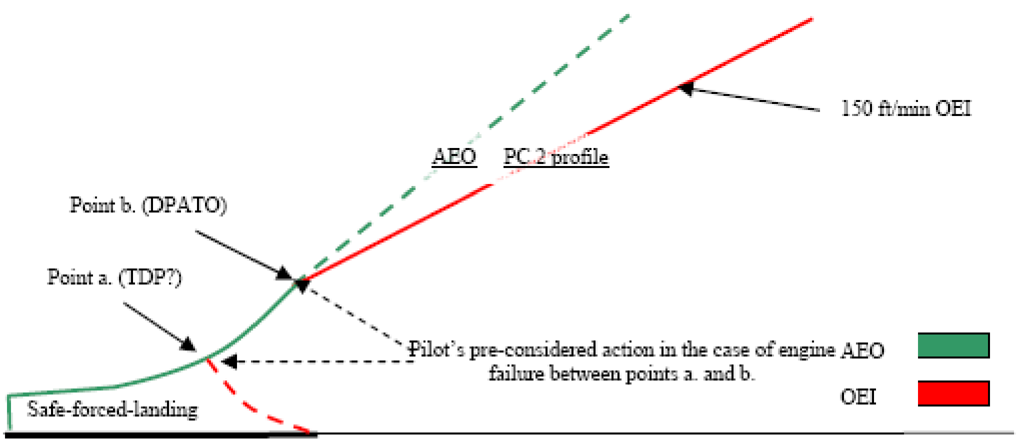
Note: The diagrams in Attachment A of ICAO Annex 6, do not appear to take account of drop down permitted under Category A procedures; similarly with helideck departures, the potential for acceleration in drop down below deck level (once the deck edge has been cleared) is also not shown. These omissions could be regarded as a simplification of the diagram, as drop down is discussed and accepted in the accompanying ICAO text.

It may reasonably be argued that, during the take-off and before reaching an appropriate climb speed (Vtoss or Vy), Vstayup will already have been achieved (where Vstayup is the ability to continue the flight and accelerate without descent shown in some Category A procedures as VT or target speed) and where, in the event of an engine failure, no landing would be required.

It is postulated that, to practically satisfy all the requirements of sections 4 a, b and c above, we do not need to define DPATO at one synchronised point; we can meet requirements separately - i.e. defining the distance for a safe-forced-landing, and then establishing the OEI obstacle clearance flight path.

As the point at which the helicopter's ability to continue the flight safely, with the critical power unit inoperative is the critical element, it is that for which DPATO is used in this text.

Figure 5 - The three elements in a PC 2 take-off



6.2.1 The three elements from the pilot's perspective

When seen from the pilot's perspective (see Figure 5), there are three elements of the PC 2 take-off - each with associated related actions which need to be considered in the case of an engine failure:

a. action in the event of an engine failure - up to the point where a forced-landing will be required.

b. action in the event of an engine failure - from the point where OEI obstacle clearance is established (DPATO).

c. pre-considered action in the event of an engine failure - in the period between a. and b.

The action of the pilot in a. and b. is deterministic i.e. it remains the same for every occasion. For preconsideration of the action at point c.; as is likely that the planned flight path will have to be abandoned (the point at which obstacle clearance using the OEI climb gradients not yet being reached) the pilot must (before take-off) have considered his options and the associated risks, and have in mind the course of action that will be pursued in the event of an engine failure during that short period. (As it is likely that any action will involve turning manoeuvres, the effect of turns on performance must be considered.)

Take-off mass for Performance Class 2

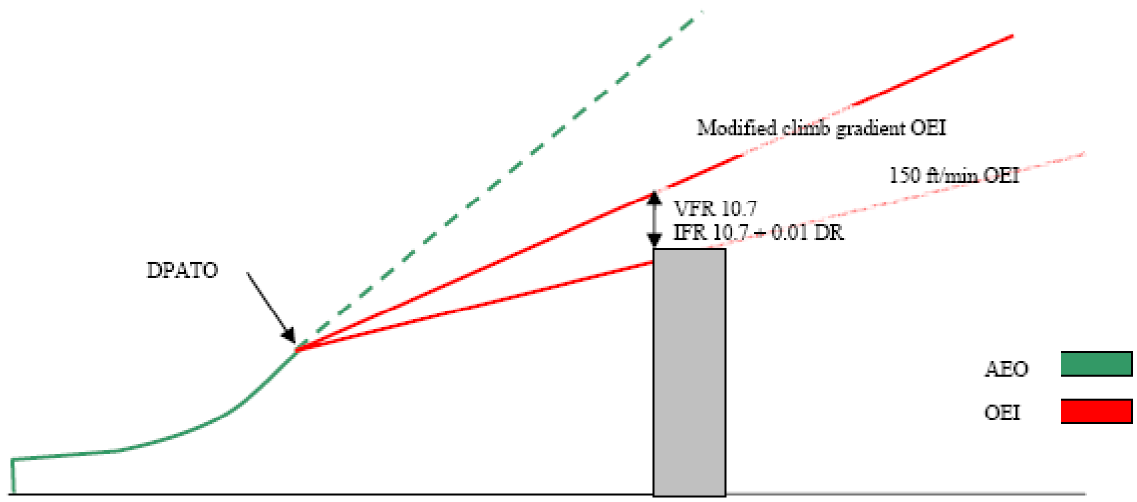
As previously stated, Performance Class 2 is an AEO take-off which, from DPATO, has to meet the requirement for OEI obstacle clearance in the climb and en-route phases. Take-off mass is therefore the mass that gives at least the minimum climb performance of 150 ft/min at Vy, at 1000 ft above the take-off point, and obstacle clearance.

As can be seen in Figure 6 below, the take-off mass may have to be modified when it does not provide the required OEI clearance from obstacles in the take-off-flight path (exactly as in Performance Class 1). This could occur when taking off from a heliport or landing location where the flight path has to clear an obstacle such a ridge line (or line of buildings) which can neither be:

- flown around using VFR and see and avoid; nor
- cleared using the minimum climb gradient given by the take-off mass (150 ft/min at 1,000 ft)

In this case, the take-off mass has to be modified (using data contained in the HFM) to give an appropriate climb gradient.

Figure 6 - Performance Class 2 (enhanced climb gradient)



6.4 Do distances have to be calculated?

Distances do not have to be calculated if, by using pilot judgement or standard practice, it can be established that:

- A safe-forced-landing is possible following an engine failure (notwithstanding that there might be obstacles in the take-off path); and
- Obstacles can be cleared (or avoided) - AEO in the take-off phase and OEI in the climb.

If early entry (in the sense of cloud base) into IMC is expected - an IFR departure should be planned. However, standard masses and departures can be used when described in the Operations Manual.

6.5 The use of Category A data

In Category A procedures, TDP is the point at which either a rejected landing or a safe continuation of the flight, with OEI obstacle clearance, can be performed.

For PC 2 (when using Category A data), only the safe-forced-landing (reject) distance depends on the equivalent of the TDP; if an engine fails between TDP and DPATO the pilot has to decide what action is required - it is not necessary for a safe-forced-landing distance to be established from beyond the equivalent of TDP (see Figure 5 and discussion in section 6.2.1 above).

Category A procedures based on a fixed Vtoss are usually optimised either for the reduction of the rejected take-off distance, or the take-off distance. Category A procedures based on a variable Vtoss allow either a reduction in required distances (low Vtoss) or an improvement in OEI climb capability (high Vtoss). These optimisations may be beneficial in PC 2 to satisfy the dimensions of the take-off site.

In view of the different requirements for PC 2 (from PC 1), it is perfectly acceptable for the two calculations (one to establish the safe-forced-landing distance and the other to establish DPATO) to be based upon different Category A procedures. However, if this method is used, the mass resulting from the calculation cannot be more than the mass from the more limiting of the procedures.

6.6 DPATO and obstacle clearance

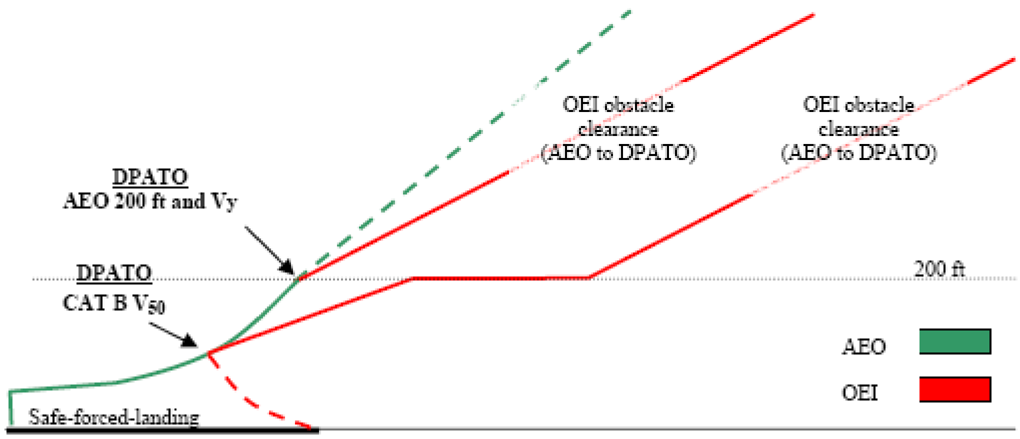
If it is necessary for OEI obstacle clearance to be established in the climb, the starting point (DPATO) for the (obstacle clearance) gradient has to be established. Once DPATO is defined, the OEI obstacle clearance is relatively easy to calculate with data from the HFM.

6.6.1 DPATO based on AEO distance

In the simplest case; if provided, the scheduled AEO to 200 ft at Vy can be used (see Figure 7).

In the simplest case; if provided, the scheduled AEO to 200 ft at Vy can be used (see I

Figure 7 -Suggested AEO locations for DPATO

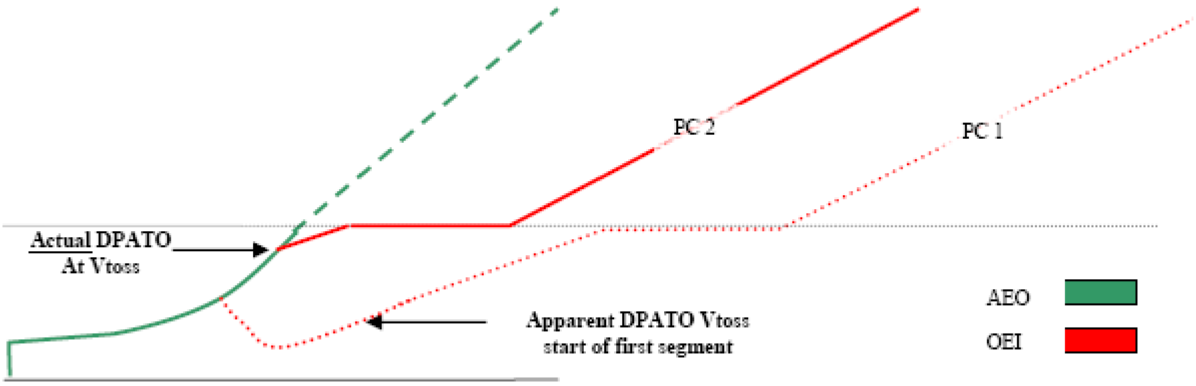


Otherwise, and if scheduled in the HFM, the AEO distance to 50ft (V_{50}) – determined in accordance with CS 29.63 - can be used (see Figure 7). Where this distance is used, it will be necessary to ensure that the V_{50} climb out speed is associated with a speed and mass for which OEI climb data is available so that, from V_{50}, the OEI flight path can be constructed.

6.6.2 DPATO based on Category A distances

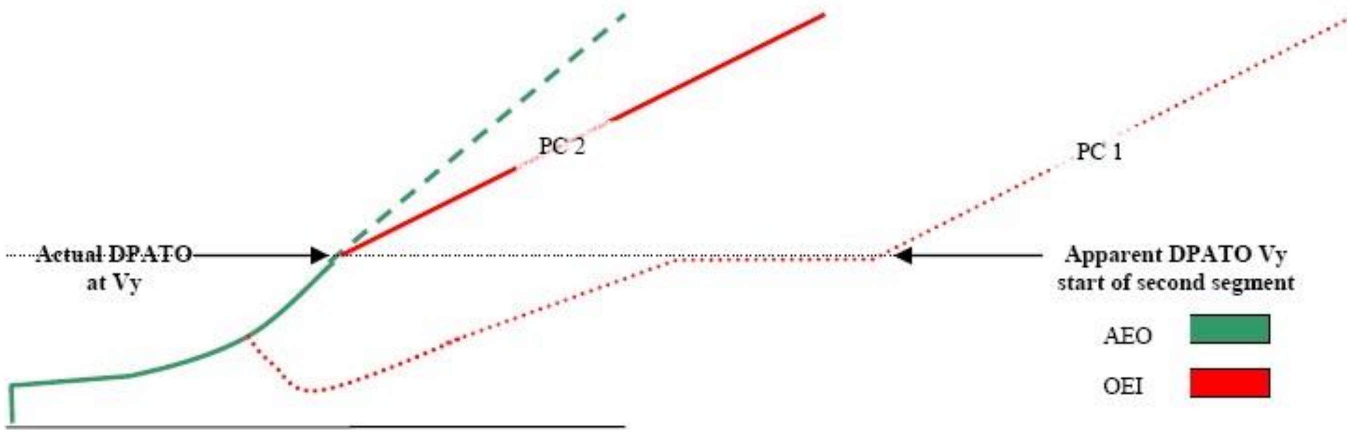
It is not necessary for specific AEO distances to be used (although for obvious reasons it is preferable); if they are not available, a flight path (with OEI obstacle clearance) can be established using Category A distances (see Figure 8 and Figure 9) - which will then be conservative.

Figure 8 - Using Cat A data; actual and apparent position of DPATO (Vtoss and start of first segment)



Note: the apparent DPATO is for planning purposes only in the case where AEO data is not available to construct the take-off flight path. The actual OEI flight path will provide better obstacle clearance than the apparent one (used to demonst rate the minimum requirement) - as seen from the firm and dashed lines in the above diagram.

Figure 9 - Using Cat A data; actual and apparent position of DPATO (Vy and start of second segment)



6.6.3 Use of most favourable Category A data

The use of AEO data is recommended for calculating DPATO. However, where an AEO distance is not provided in the flight manual, distance to Vy at 200 ft, from the most favourable of the Category A procedures, can be used to construct a flight path (provided it can be demonstrated that AEO distance to 200 ft at Vy is always closer to the take-off point than the CAT A OEI flight path).

In order to satisfy the requirement of ANTR-OPS 3.525, the last point from where the start of OEI obstacle clearance can be shown is at 200 ft.

6.7 The calculation of DPATO - a summary

DPATO should be defined in terms of speed and height above the take-off surface and should be selected such that HFM data (or equivalent data) is available to establish the distance from the start of the take-off up to the DPATO (conservatively if necessary).

6.7.1 First method

DPATO is selected as the HFM Category B take-off distance (V50 speed or any other take-off distance scheduled in accordance with CS 29.63) provided that within the distance the helicopter can achieve:

- One of the Vtoss values (or the unique Vtoss value if is not variable) provided in the HFM, selected so as to assure a climb capability according to Cat A criteria; or

- Vy.

Compliance with ANTR-OPS 3.525 would be shown from V50 (or the scheduled Category B take-off distance).

6.7.2 Second method

DPATO is selected as equivalent to the TDP of a Category A clear area take-off procedure conducted in the same conditions.

Compliance with ANTR-OPS 3.525 would be shown from the point at which V_{toss}, a height of at least 35 ft above the take-off surface and a positive climb gradient are achieved (which is the Category A clear area take-off distance).

Safe-forced-landing areas should be available from the start of the take-off, to a distance equal to the Category A "clear area" rejected take-off distance.

6.7.3 Third method

As an alternative; DPATO could be selected such that Helicopter Flight Manual one engine inoperative (OEI) data is available to establish a flight path initiated with a climb at that speed. This speed should then be:

- One of the Vtoss values (or the unique Vtoss value if is not variable) provided in the Helicopter Flight Manual, selected so as to assure a climb capability according to Category A criteria; or

- Vy.

The height of the DPATO should be at least 35 ft and can be selected up to 200 ft. Compliance with ANTR-OPS 3.525 would be shown from the selected height.

6.8 Safe-forced-landing distance

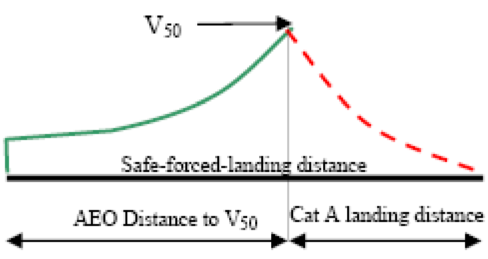
Except as provided in 6.7.2 above, the establishment of the safe-forced-landing distance could be problematical as is not likely that PC 2 specific data will be available in the HFM.

By definition, the Category A reject distance may be used when the surface is not suitable for a reject, but may be satisfactory for a safe-force-landing (for example where the surface is flooded or is covered with vegetation).

Any Category A (or other accepted) data may be used to establish the distance – however, once established it remains valid only if the Category A mass (or the mass from the accepted data) is used and the Category A (or accepted) AEO profile to the TDP is flown. In view of these constraints, the likeliest Category A procedures are the clear area or the short field (restricted area/site) procedures.

From Figure 10, it can be seen that if the Category B V_{50} procedure is used to establish DPATO, the combination of the distance to 50 ft and the Category A 'clear area' landing distance, required by CS 29.81 (the horizontal distance required to land and come to a complete stop from a point 50 ft above the landing surface), will give a good indication of the maximum safe-forced-landing distance required (see also the discussion on V_{stayup} above).

Figure 10 - Category B (V_{50}) safe-forced-landing distance



6.9 Performance Class 2 landing

For other than PC 2 operations to elevated heliport or landing location/helidecks (see the discussion in section 7.4.1 below), the principles for the landing case are much simpler. As the performance requirement for PC 1 and PC 2 landings are virtually identical, the condition of the landing surface is the main issue.

If the engine fails at any time during the approach, the helicopter must be able either: to perform a goaround meeting the requirements of ANTR-OPS 3.525; or perform a safe-forced-landing on the surface. In view of this, and if using PC 1 data, the LDP should not be lower that the corresponding TDP (particularly in the case of a variable TDP).

The landing mass will be identical to the take-off mass for the same site (with consideration for any reduction due to obstacle clearance - as shown in Figure 6 above).

In the case of a balked landing (i.e. the landing site becomes blocked or unavailable during the approach); the full requirement for take-off obstacle clearance must be met.

7. OPERATIONS IN PERFORMANCE CLASS 2 WITH EXPOSURE

ANTR-OPS 3 offers an opportunity to discount the requirement for an assured safe-forced-landing area in the take-off or landing phase - subject to an approval from the BCAA. The following sections deals with this option:

7.1 Limit of Exposure

As stated above, Performance Class 2 has to ensure AEO obstacle clearance to DPATO and OEI obstacle clearance from that point. This does not change with the application of exposure.

It can therefore be stated that operations with exposure are concerned only with alleviation from the requirement for the provision of a safe-forced-landing.

The absolute limit of exposure is 200 ft - from which point OEI obstacle clearance must be shown.

7.2 The principle of Risk Assessment

ICAO Annex 6 Part III Chapter 3.1.2 (Fifth Edition July 2001) states that:

- 3.1.2 Performance Class 3 helicopters shall only be operated in conditions of weather and light, and over such routes and diversions therefrom, that permit a safe-forced-landing to be executed in the event of enginefailure. The conditions of this paragraph apply also to performance Class 2 helicopters prior to the defined point after take-off and after the defined point before landing.

The ICAO Helicopter and Tilt-rotor Study Group, is engaged in an ongoing process to amend Chapter 3 to take account of current practices – following this process the proposed text is likely to be:

- 3.1.2 In conditions where the safe continuation of flight is not ensured in the event of a critical power unit failure, helicopter operations shall be conducted in a manner that gives appropriate consideration for achieving a safe-forced-landing.

Although a safe-forced-landing may no longer be the (absolute) Standard, it is considered that Risk Assessment is obligatory to satisfy the amended requirement for ‘appropriate consideration’.

Risk Assessment used in ANTR-OPS 3 for fulfilment of this proposed Standard is consistent with principles described in ‘AS/NZS 4360:1999’.

Note: terms used in this text and defined in the AS/NZS Standard are shown in Sentence Case e.g. Risk Assessment or Risk Reduction.

7.3 The application of Risk Assessment to ANTR-OPS 3 Performance Class 2

Under circumstances where no risk attributable to engine failure (beyond that inherent in the safe-forced landing) is present, operations in Performance Class 2 may be conducted in accordance with the non alleviated requirements contained above - and a safe-forced-landing will be possible.

Under circumstances where such risk would be present i.e.: operations to an elevated heliport or landing location (deck edge strike); or, when permitted, operations from a site where a safe-forced-landing cannot be accomplished because the surface is inadequate; or where there is penetration into the HV curve for a short period during take-off or landing (a limitation in CS 29 HFMs), operations have to be conducted under a specific approval.

Provided such operations are Risk Assessed and can be conducted to an established safety target – they may be approved.

7.3.1 The elements of the Risk Management The approval process consists of an operational Risk Assessment and the application of four principles: a safety target; a helicopter reliability assessment; continuing airworthiness; and mitigating procedures.

7.3.2 The safety target

The main element of the JAA Risk Assessment when exposure was initially introduced into JAR-OPS 3 (NPA OPS-8), was the assumption that turbine engines in helicopters would have failure rates of about 1:100 000 per flying hour; which would permit (against the agreed safety target of 5 x 10-8 per event) an exposure of about 9 seconds for twins during the take-off or landing event. (When choosing this target it was assumed that the majority of current well maintained turbine powered helicopters would be capable of meeting the event target - it therefore represents the Residual Risk)

Note: Residual Risk is considered to be the risk that remains when all mitigating procedures -airworthiness and operational - are applied (see sections 7.3.4 and 7.3.5 below).

7.3.3 The reliability assessment. The JAA reliability assessment was initiated to test the hypothesis (stated in 7.3.2 above) that the majority of turbine powered types would be able to meet the safety target. This hypothesis could only be confirmed by an examination of the manufacturers' power-loss data.

7.3.4 Mitigating procedures (airworthiness)

Mitigating procedures consist of a number of elements: the fulfilment of all manufacturers' safety modifications; a comprehensive reporting system (both failures and usage data); and the implementation of a Usage Monitoring System (UMS). Each of these elements is to ensure that engines, once shown to be sufficiently reliable to meet the safety target, will sustain such reliability (or improve upon it).

The monitoring system is felt to be particularly important as it had already been demonstrated that when such systems are in place it inculcates a more considered approach to operations. In addition the elimination of 'hot starts', prevented by the UMS, itself minimises the incidents of turbine burst failures.

7.3.5 Mitigating procedures (operations)

Operational and training procedures, to mitigate the risk - or minimise the consequences - are required of the operator. Such procedures are intended to minimise risk by ensuring that: the helicopter is operated within the exposed region for the minimum time; and simple but effective procedures are followed to minimise the consequence should an engine failure occur.

7.4 Operation with Exposure - the alleviation and the requirement

When operating with exposure, there is alleviation from the requirement to establish a safe-forced-landing area (which extends to landing as well as take-off); however, the requirement for obstacle clearance AEO in the take-off and from DPATO OEI in the climb and en-route phases remains (both for take-off and landing).

The take-off mass is obtained from the more limiting of the following:

- the climb performance of 150 ft/min at 1000 ft above the take-off point; or

- obstacle clearance (in accordance with 6.3 above); or

- AEO hover out of ground effect (HOGE) performance at the appropriate power setting. (AEO HOGE is required to ensure acceleration when (near) vertical dynamic take-off techniques are being used. Additionally for elevated heliports or landing locations/helidecks, it ensures a power reserve to offset ground cushion dissipation; and ensures that, during the landing manoeuvre, a stabilised HOGE is available - should it be required.)

7.4.1 Operations to elevated heliport or landing location/helidecks

PC 2 operations to elevated heliports and helidecks are a specific case of operations with exposure. In these operations, the alleviation covers the possibility of:

- a deck-edge strike if the engine fails early in the take-off or late in the landing; and

- penetration into the HV Curve during take-off and landing; and

- forced landing with obstacles on the surface (hostile water conditions) below the elevated heliport or landing location (helideck). The take-of mass is as stated above and relevant techniques are as described in AC OPS 3.520(a)(3) and 3.535(a)(3)

Note: It is unlikely that the DPATO will have to be calculated with operations to helidecks (due to the absence of obstacles in the take-off path).

7.4.2 Additional requirements for operations to Helidecks in a Hostile Environment

For a number of reasons (e.g. the deck size, and the helideck environment – including obstacles and wind vectors), it was not anticipated that operations in PC 1 would be technically feasible or economically justifiable by the projected JAA deadline of 2010 (OEI HOGE could have provided a method of compliance but this would have resulted in a severe and unwarranted restriction on payload/range).

However, due to the severe consequences of an engine failure to helicopters involved in take-off and landings to helidecks located in hostile sea areas (such as the North Sea or the North Atlantic), a policy of Risk Reduction is called for. As a result, enhanced Class 2 take-off and landing masses together with techniques that provide a high confidence of safety due to: deck-edge avoidance; and, drop-down that provides continued flight clear of the sea, are seen as practical measures.

For helicopters which have a Category A elevated helideck procedure, certification is satisfied by demonstrating a procedure and adjusted masses (adjusted for wind as well as temperature and pressure) which assure a 15ft deck edge clearance on take-off and landing. It is therefore recommended that manufacturers, when providing enhanced PC2 procedures, use the provision of this deck-edge clearance as their benchmark.

As the height of the helideck above the sea is a variable, drop down has to be calculated; once clear of the helideck, a helicopter operating in PC1 would be expected to meet the 35ft obstacle clearance. Under circumstances other than open sea areas and with less complex environmental conditions, this would not present difficulties. As the provision of drop down takes no account of operational circumstances, standard drop down graphs for enhanced PC2 similar to those in existence for Category A procedures are anticipated.

Under conditions of offshore operations, calculation of drop down is not a trivial matter the following examples indicate some of the problems which might be encountered in hostile environments:

- Occasions when tide is not taken into account and the sea is running irregularly - the level of the obstacle (i.e. - the sea) is indefinable making a true calculation of drop down impossible.

- Occasions when it would not be possible - for operational reasons - for the approach and departure paths to be clear of obstacles - the 'standard' calculation of drop-down could not be applied.

Under these circumstances, practicality indicates that drop-down should be based upon the height of the deck AMSL and the 35ft clearance should be applied.

There are however, other and more complex issues which will also affect the deck-edge clearance and drop down calculations:

- When operating to moving decks on vessels, a recommended landing or take-off profile might not be possible because the helicopter might have to hover alongside in order that the rise and fall of the ship is mentally mapped; or, on take-off re-landing in the case of an engine failure might not be an option.

Under these circumstances, the Commander might adjust the profiles to address a hazard more serious or more likely than that presented by an engine failure.

It is because of these and other (unforeseen) circumstances that a prescriptive requirement is not used. However, the target remains a 15ft deck-edge clearance and a 35ft obstacle clearance and data should be provided such that, where practically possible, these clearances can be planned.

As accident/incident history indicates that the main hazard is collision with obstacles on the helideck due to human error, simple and reproducible take-off and landing procedures are recommended.

In view of the reasons stated above, the future requirement for PC 1 is replaced by the new requirement that the take-off mass takes into account: the procedure; deck-edge miss; and drop down appropriate to the height of the helideck. This will require calculation of take-off mass from information produced by manufacturers reflecting these elements. It is expected that such information will be produced by performance modelling/simulation using a model validated through limited flight testing.

7.4.3 Operations to Helidecks for Helicopters with a MAPSC of more than 19

The original requirement for operations of helicopters with a MAPSC of more than 19 was PC 1 (as set out in ANTR-OPS 3.470(a)(2)).

However, when operating to helidecks, the problems enumerated in 7.4.2 above are equally applicable to these helicopters. In view of this, but taking into account that increased numbers are (potentially) being carried, such operations are permitted in PC 2 (ANTR-OPS 3.470(a)(2)) but, in all helideck environments (both hostile and non-hostile), have to satisfy, the additional requirements, set out in 7.4.2 above.

AC-1 to Appendix 1 to ANTR-OPS 3.517(a)
Helicopter operations without an assured safe forced landing capability

1. As part of the risk assessment prior to granting an approval under Appendix 1 to ANTR-OPS 3.517(a), the operator should provide appropriate powerplant reliability statistics available for the helicopter type and the engine type.

2. Except in the case of new engines, such data should show sudden power loss from the set of in-flight shutdown (IFSD) events not exceeding 1 per 100,000 engine hours in a 5 year moving window. However, a rate in excess of this value, but not exceeding 3 per 100,000 engine hours, may be accepted by the BCAA after an assessment showing an improving trend.

3. New engines should be assessed on a case-by-case basis.

4. After the initial assessment, updated statistics should be periodically reassessed; any adverse sustained trend will require an immediate evaluation to be accomplished by the operator in consultation with the BCAA and the manufacturers concerned. The evaluation may result in corrective action or operational restrictions being applied.

5. The purpose of this paragraph is to provide guidance on how the in-service power plant sudden power loss rate is determined.

5.1. Share of roles between the helicopter and engine Type Certificate Holders (TCH).

a) The provision of documents establishing the in-service sudden power loss rate for the helicopter/engine installation; the interface with the operational Authority of the State of Design should be the Engine TCH or the Helicopter TCH depending on the way they share the corresponding analysis work.

b) The Engine TCH should provide the Helicopter TCH with a document including: the list of in-service power loss events, the applicability factor for each event (if used), and the assumptions made on the efficiency of any corrective actions implemented (if used);

c) The Engine or Helicopter TCH should provide the operational Authority of the State of Design or, where this Authority does not take responsibility, the operational Authority of the State of the Operator, with a document that details the calculation results - taking into account: the events caused by the engine and the events caused by the engine installation; the applicability factor for each event (if used), the assumptions made on the efficiency of any corrective actions implemented on the engine and on the helicopter (if used); and the calculation of the powerplant power loss rate,

5.2 Documentation The following documentation should be updated every year.

5.2.1 The document with detailed methodology and calculation as distributed to the BCAA of the State of Design.

5.2.2 A summary document with results of computation as made available on request to any operational Authority.

5.2.3 A Service Letter establishing the eligibility for such operation and defining the corresponding required configuration as provided to the operators.

5.3. Definition of the “sudden in-service power loss”. The sudden in-service power loss is an engine power loss:

- larger than 30 % of the take-off power; and
- occurring during operation; and

- without the occurrence of an early intelligible warning to inform and give sufficient time for the pilot to take any appropriate action.

5.4. Data base documentation.

Each power loss event should be documented, by the engine and/or helicopter TCH's, as follows:

- incident report number;
- engine type;
- engine serial number;
- helicopter serial number;
- date;
- event type (demanded IFSD, un-demanded IFSD);
- presumed cause;
- applicability factor when used;
- reference and assumed efficiency of the corrective actions that will have to be applied (if any);

5.5. Counting methodology.

Various methodologies for counting engine power loss rate have been accepted by Authorities. The following is an example of one of these methodologies:

5.5.1 The events resulting from:

- unknown causes (wreckage not found or totally destroyed, undocumented or unproven statements); or
- where the engine or the elements of the engine installation have not been investigated (for example when the engine has not been returned by the customer); or
- an unsuitable or non representative use (operation or maintenance) of the helicopter or the engine are not counted as engine in-service sudden power loss and the applicability factor is 0%.

5.5.2 The events caused by:

- the engine or the engine installation; or
- the engine or helicopter maintenance, when the applied maintenance was compliant with the Maintenance Manuals are counted as engine in-service sudden power loss and the applicability factor is 100%.

5.5.3 For the events where the engine or an element of the engine installation has been submitted to investigation which did not allow to define a presumed cause the applicability factor is 50 %.

5.6. Efficiency of corrective actions.

The corrective actions made by the engine and helicopter manufacturers on the definition or maintenance of the engine or its installation could be defined as mandatory for specific ANTR- OPS 3 operations. In this case the associated reliability improvement could be considered as mitigating factor for the event. A factor defining the efficiency of the corrective action could be applied to the applicability factor of the concerned event.

5.7. Method of calculation of the powerplant power loss rate.

The detailed method of calculation of the powerplant power loss rate should be documented by engine or helicopter TCH and accepted by the relevant Authority.

AC-2 to Appendix 1 to ANTR-OPS 3.517(a)
Helicopter operations without an assured safe forced landing capability

To obtain an approval under Appendix 1 to ANTR-OPS 3.517(a), the operator conducting operations without an assured safe forced landing capability should implement the following:

1. Attain and then maintain the helicopter/engine modification standard defined by the manufacturer that has been designated to enhance reliability during the take-off and landing phases.

2. Conduct the preventive maintenance actions recommended by the helicopter or engine manufacturer as follows:

2.1 Engine oil spectrometric and debris analysis - as appropriate;

2.2 Engine trend monitoring, based on available power assurance checks;

2.3 Engine vibration analysis (plus any other vibration monitoring systems where fitted).

2.4 Oil consumption monitoring.

3. The Usage Monitoring System should fulfil at least the following:

3.1 Recording of the following data:

- Date and time of recording, or a reliable means of establishing these parameters;

- Amount of flight hours recorded during the day plus total flight time;

- N1 (gas producer RPM) cycle count;

- N2 (power turbine RPM) cycle count (if the engine features a free turbine);

- Turbine temperature exceedance: value, duration;

- Power-shaft torque exceedance: value, duration (if a torque sensor is fitted);

- Engine shafts speed exceedance: value, duration;

3.2 Data storage of the above parameters, if applicable, covering the maximum flight time in a day, and not less than 5 flight hours, with an appropriate sampling interval for each parameter.

3.3 The system should include a comprehensive self-test function with a malfunction indicator and a detection of power-off or sensor input disconnection.

3.4 A means should be available for downloading and analysis of the recorded parameters. Frequency of downloading should be sufficient to ensure data is not lost through over-writing.

3.5 The analysis of parameters gathered by the usage monitoring system, the frequency of such analysis and subsequent maintenance actions should be described in the maintenance documentation.

3.6 The data should be stored in an acceptable form and accessible to the BCAA, for at least 24 months.

4. Include take-off and landing procedures in the operations manual, where they do not already exist in the Helicopter Flight Manual.

5. Establish training for flight crew which should include the discussion, demonstration, use and practice of the techniques necessary to minimise the risks;

6. Report to the manufacturer any loss of power control, engine shutdown (precautionary or otherwise) or power unit failure for any cause (excluding simulation of power unit failure during training). The content of each report should provide:

- Date and time;

- Operator (and Maintenance organisations where relevant);

- Type of helicopter and description of operations;
- Registration and serial number of airframe;
- Engine type and serial number;
- Power unit modification standard where relevant to failure;
- Engine position;
- Symptoms leading up to the event.
- Circumstances of power unit failure including phase of flight or ground operation;
- Consequences of the event;
- Weather/environmental conditions;
- Reason for power unit failure – if known;
- In case of an In Flight Shut Down (IFSD), nature of the IFSD (Demanded/Un-demanded);
- Procedure applied and any comment regarding engine restart potential;
- Engine hours and cycles (from new and last overhaul);
- Airframe flight hours;
- Rectification actions applied including, if any, component changes with part number and serial number of the removed equipment; and
- Any other relevant information

AC OPS 3.520(a)(3)
Procedure for continued operations to helidecks
See ANTR OPS 3.520(a)(3) and 3.535(a)(3)

1 Factors to be considered when taking off from or landing on a helideck

1.1 In order to take account of the considerable number of variables associated with the helideck environment, each take-off and landing may require a slightly different profile. Factors such as helicopter mass and centre of gravity, wind velocity, turbulence, deck size, deck elevation and orientation, obstructions, power margins, platform gas turbine exhaust plumes etc., will influence both the take -off and landing. In particular, for the landing, additional considerations such as the need for a clear go -around flight path, visibility and cloud base etc., will affect the Commander's decision on the choice of landing profile. Profiles may be modified, taking account of the relevant factors noted above and the characteristics of individual helicopter types.

2 Terminology

2.1 See ANTR OPS 3.480 as appropriate.

3 Performance

3.1 To perform the following take-off and landing profiles, adequate all engines operating (AEO) hover performance at the helideck is required. In order to provide a minimum level of performance, data (derived from the Flight Manual AEO out of ground effect (OGE), with wind accountability) should be used to provide the maximum take-off or landing mass. Where a helideck is affected by downdrafts or turbulence or hot gases, or where the take-off or landing profile is obstructed, or the approach or take- off cannot be made into wind, it may be necessary to decrease this take-off or landing mass by using a suitable calculation method recommended by the manufacturer. The helicopter mass should not exceed that required by ANTR OPS 3.520(a)(1) or ANTR OPS 3.535(a)(1).

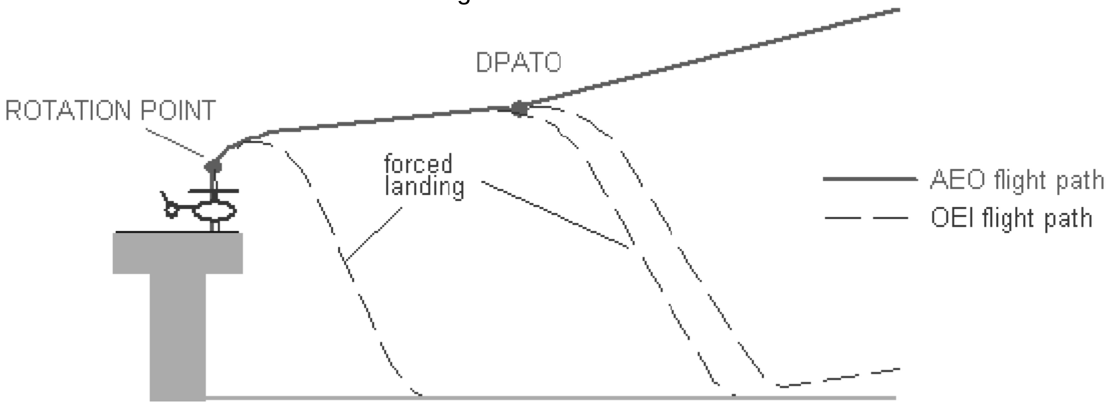
Note 1: For helicopter types no longer supported by the manufacturer, data may be established by the operator, provided they are acceptable to the BCAA.

4 Take-off profile

4.1 The take-off should be performed in a dynamic manner ensuring that the helicopter continuously moves vertically from the hover to the Rotation Point (RP) and thence into forward flight. If the manoeuvre is too dynamic then there is an increased risk of losing spatial awareness (through loss of visual cues) in the event of a rejected take-off, particularly at night.

4.2 If the transition to forward flight is too slow, the helicopter is exposed to an increased risk of contactingthe deck edge in the event of an engine failure at or just after the point of cyclic input (RP).

4.3 It has been found that the climb to RP is best made between 110% and 120% of the power required in the hover. This power offers a rate of climb which assists with deck-edge clearance following power unit failure at RP, whilst minimising ballooning following a failure before RP. Individual types will require selection of different values within this range.



5 Selection of a lateral visual cue

5.1 In order to obtain the maximum performance in the event of an engine failure being recognised at or just after RP, the RP must be at its optimum value, consistent with maintaining the necessary visual cues. If an engine failure is recognised just before RP, the helicopter, if operating at a low mass, may 'balloon' a significant height before the reject action has any effect. It is, therefore, important that the Pilot Flying selects a lateral visual marker and maintains it until the RP is achieved, particularly on decks with few visual cues. In the event of a rejected take-off, the lateral marker will be a vital visual cue in assisting the pilot to carry out a successful landing.

6 Selection of the rotation point

6.1 The optimum RP should be selected to ensure that the take-off path will continue upwards and away from the deck with All Engines Operating (AEO), but minimising the possibility of hitting the deck edge due to the height loss in the event of an engine failure at or just after RP.

6.2 The optimum RP may vary from type to type. Lowering the RP will result in a reduced deck edge clearance in the event of an engine failure being recognised at or just after RP. Raising the RP will result in possible loss of visual cues, or a hard landing in the event of an engine failure just prior to RP.

7 Pilot reaction times

7.1 Pilot reaction time is an important factor affecting deck edge clearance in the event of an engine failure prior to or at RP. Simulation has shown that a delay of one second can result in a loss of up to 15 ft in deck edge clearance.

8 Variation of wind speed

8.1 Relative wind is an important parameter in the achieved take-off path following an engine failure; wherever practicable, take-off should be made into wind. Simulation has shown that a 10 knot wind can give an extra 5 ft deck edge clearance compared to a zero wind condition.

9 Position of the helicopter relative to the deck edge

9.1 It is important to position the helicopter as close to the deck edge (including safety nets) as possible whilst maintaining sufficient visual cues, particularly a lateral marker.

9.2 The ideal position is normally achieved when the rotor tips are positioned at the forward deck edge. This position minimises the risk of striking the deck edge following recognition of an engine failure at or just after RP. Any take-off heading which causes the helicopter to fly over obstructions below and beyond the deck edge should be avoided if possible. Therefore, the final take-off heading and position will be a compromise between the take-off path for least obstructions, relative wind, turbulence and lateral marker cue considerations.

10 Actions in the event of an engine failure at or just after RP

10.1 Once committed to the continued take-off, it is important, in the event of an engine failure, to rotate the aircraft to the optimum attitude in order to give the best chance of missing the deck edge. The optimum pitch rates and absolute pitch attitudes, should be detailed in the profile for the specific type.

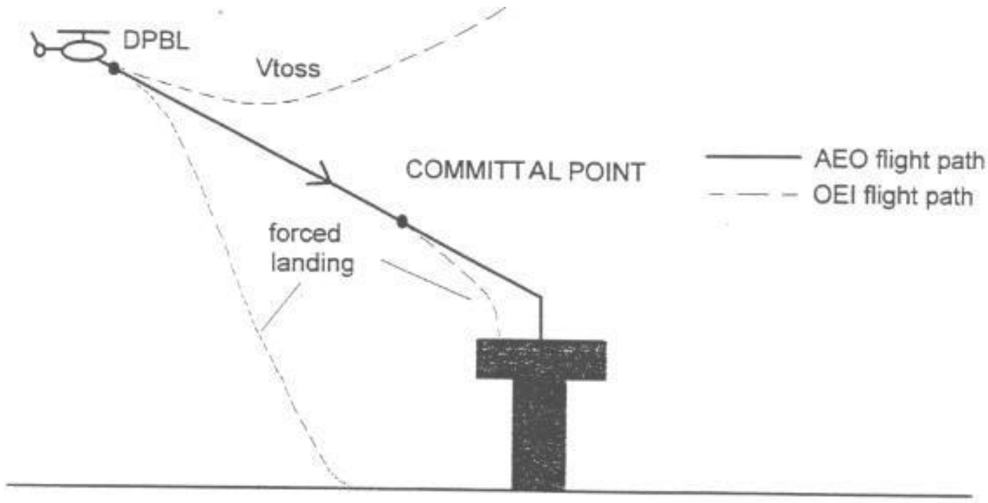
11 Take-off from helidecks which have significant movement

11.1 This technique should be used when the helideck movement and any other factors, eg insufficient visual cues, makes a successful rejected take-off unlikely. Weight should be reduced to permit an improvedone engine inoperative capability, as necessary.

11.2 The optimum take-off moment is when the helideck is level and at its highest point, eg horizontal on top of the swell. Collective pitch should be applied positively and sufficiently to make an immediate transition to climbing forward flight. Because of the lack of a hover, the take-off profile should be planned andbriefed prior to lift off from the deck.

12 Standard landing profile

12.1 The approach should be commenced into wind to a point outboard of the helideck. Rotor tip cl earance from the helideck edge should be maintained until the aircraft approaches this position at the requisite height (type dependent) with approximately 10 kts of ground-speed and a minimal rate of descent. The aircraft is then flown on a flight path to pass over the deck edge and into a hover over the safe landing area.



13 Offset landing profile

13.1 If the normal landing profile is impracticable due to obstructions and the prevailing wind velocity, the offset procedure may be used. This should involve flying to a hover position, approximately 90° offset from the landing point, at the appropriate height and maintaining rotor tip clearance from the deck edge. The helicopter should then be flown slowly but positively sideways and down to position in a low hover over the landing point. Normally, CP will be the point at which helicopter begins to transition over the helideck edge.

14 Training

14.1 These techniques should be covered in the training required by ANTR OPS 3, Subpart N.

IEM OPS 3.520 & 3.535
Take-off and landing
See ANTR OPS 3.520 and ANTR OPS 3.535

1 This IEM describes three types of operation to/from helidecks and elevated heliports or landing location by helicopters operating in Performance Class 2.

2 In two cases of take-off and landing, exposure time is used. During the exposure time (which is only approved for use when complying with ANTR OPS 3.517(a)) the probability of a power unit failure is regarded as extremely remote. If a power unit failure (engine failure) occurs during the exposure time a safe force landing may not be possible.

3 Take Off - Non-Hostile Environment (without an approval to operate with an exposure time) ANTR OPS 3.520(a)(2).

3.1 Figure 1 shows a typical take-off profile for Performance Class 2 operations from a helideck or an elevated heliport or landing location in a non-hostile environment.

3.2 If an engine failure occurs during the climb to the rotation point, compliance with 3.520(a)(2) will enable a safe landing or a safe forced landing on the deck.

3.3 If an engine failure occurs between the rotation point and the DPATO, compliance with 3.520(a)(2) will enable a safe forced landing on the surface, clearing the deck edge.

3.4 At or after the DPATO, the OEI flight path should clear all obstacles by the margins specified in ANTR OPS 3.525.

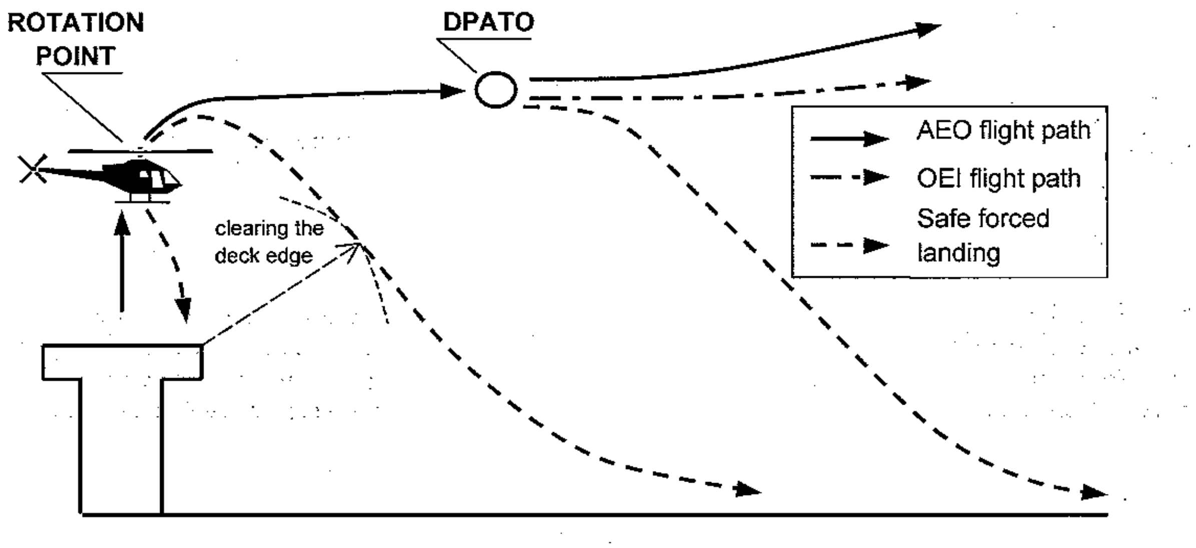


Figure 1

4 Take Off - Non-Hostile Environment (with exposure time) ANTR OPS 3.520(a)(3)

4.1 Figure 2 shows a typical take-off profile for Performance Class 2 operations from a helideck or an elevated heliport or landing location in a non-hostile environment (with exposure time).

4.2 If an engine failure occurs after the exposure time and before DPATO, compliance with 3.520(a)(3) will enable a safe force landing on the surface.

4.3 At or after the DPATO, the OEI flight path should clear all obstacles by the margins specified in ANTR OPS 3.525.

Note: an engine failure outside of exposure time should result in a safe-forced- landing or safe continuation of the flight.

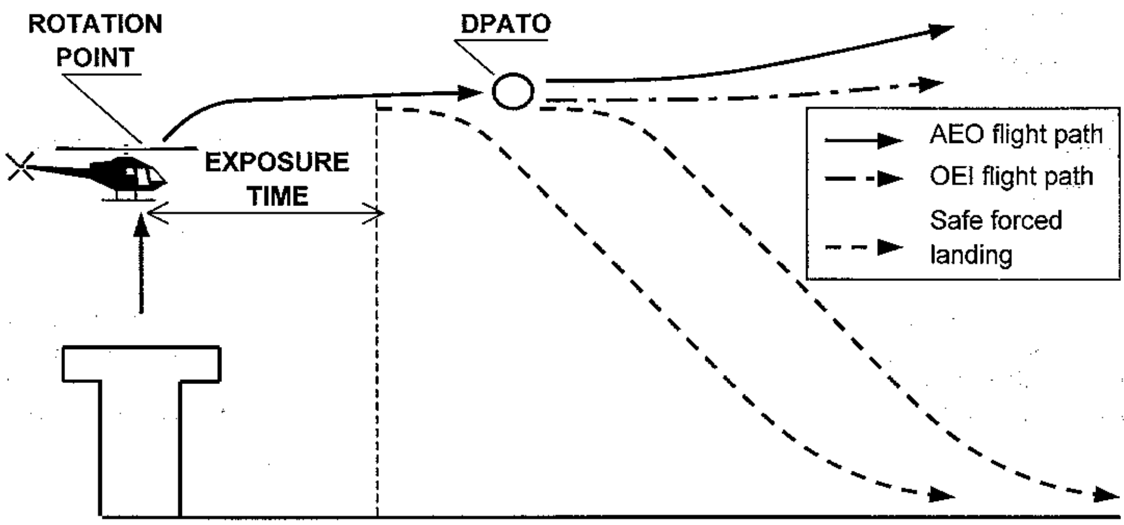


Figure 2

5 Take Off - Non-Congested Hostile Environment (with exposure time) ANTR OPS 3.520(a)(4)

5.1 Figure 3 shows a typical take off profile for Performance Class 2 operations from a helideck or an elevated heliport or landing location in a non-congested hostile environment (with exposure time).

5.2 If an engine failure occurs after the exposure time the helicopter is capable of continuing the flight.

5.3 At or after the DPATO, the OEI flight path should clear all obstacles by the margins specified in ANTR OPS 3.525.

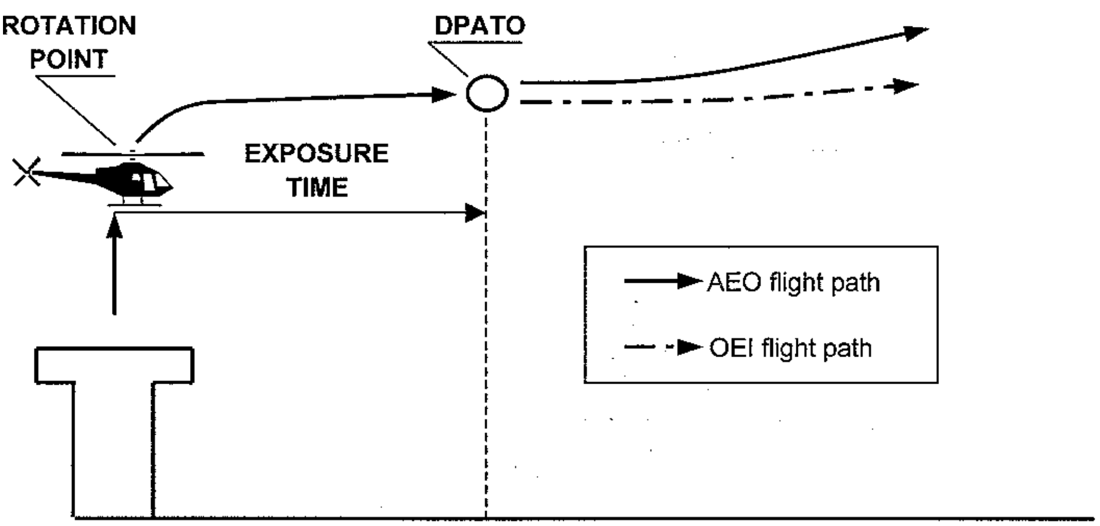


Figure 3

6. Landing - Non-Hostile Environment (without an approval to operate with an exposure time) ANTR OPS 3.535(a)(2)

6.1 Figure 4 shows a typical landing profile for Performance Class 2 operations to a helideck or an elevated heliport or landing location in a non-hostile environment.

6.2 The DPBL is defined as a "window" in terms of airspeed, rate of descent, and height above the landing surface. If an engine failure occurs before the DPBL, the pilot may elect to land or to execute a balked landing.

6.3 In the event of an engine failure being recognised after the DPBL and before the committal point,compliance with 3.535(a)(2) will enable a safe force landing on the surface.

6.4 In the event of an engine failure at or after the committed point, compliance with 3.5 35(a)(2) will enable a safe force landing on the deck.

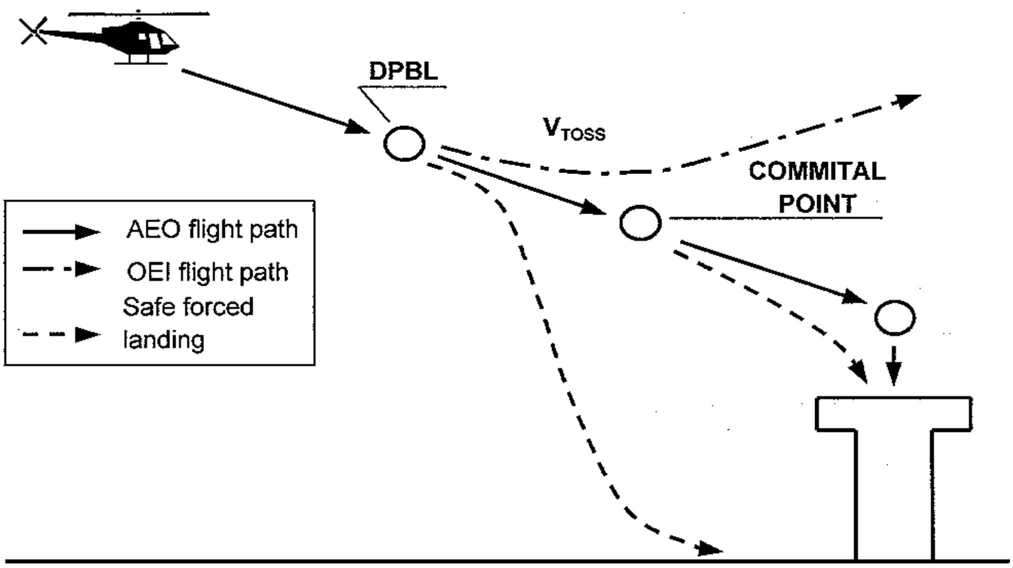


Figure 4

7 Landing - Non-Hostile Environment (with exposure time) ANTR OPS 3.535(a)(3)

7.1 Figure 5 shows a typical landing profile for Performance Class 2 operations to a helideck or an elevated heliport or landing location in a non-hostile environment (with exposure time).

7.2 The DPBL is defined as a “window” in terms of airspeed, rate of descent, and height above the landing surface. If an engine failure occurs before the DPBL, the pilot may elect to land o r to execute a balked landing.

7.3 In the event of an engine failure being recognised before the exposure time compliance with 3.535(a)(3) will enable a safe force landing on the surface.

7.4 In the event of an engine failure after the exposure time, compliance with 3.535(a)(3) will enable a safe force landing on the deck.

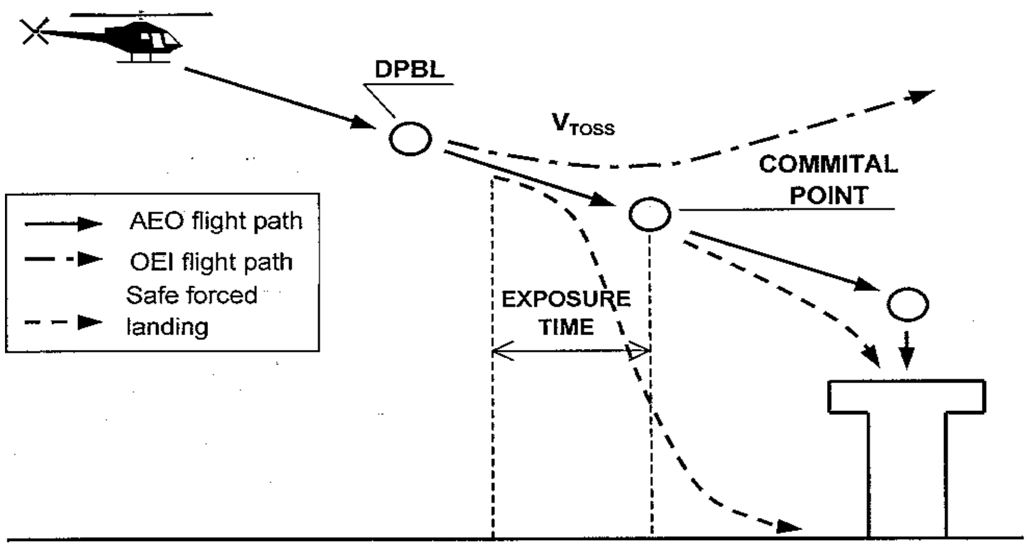


Figure 5

8. Landing - Non-Congested Hostile Environment (with exposure time) ANTR OPS 3.535(a)(4)

8.1 Figure 6 shows a typical landing profile for Performance Class 2 operations to a helideck or an elevated heliport or landing location in a non-congested hostile environment (with exposure time).

8.2 In the event of an engine failure at any point during the approach and landing phase up to the start of exposure time, compliance with ANTR OPS 3.535(a)(4) will enable the helicopter, after clearing all obstacles under the flight path, to continue the flight.

8.3 In the event of an engine failure after the exposure time, compliance with 3.535(a)(4) will enable a safe force landing on the deck.

AC/AMC/IEM I – PERFORMANCE CLASS 3

AC OPS 3.540(b)
The take-off and landing phases (Performance Class 3)
See ANTR-OPS 3.540(b)

1. To understand the use of ground level exposure in Performance Class 3, it is important first to be aware of the logic behind the use of 'take-off and landing phases'; once this is clear, it is easier to appreciate the aspects and limits of the use of ground level exposure. This AC shows the derivation of the term from the ICAO definition of the 'en-route phase' and then gives practical examples of the use, and limitations on the use, of ground level exposure in ANTR-OPS 3.540(b).

2. The take-off phase in Performance Class 1 and Performance Class 2 may be considered to be bounded by 'the specified point in the take-off' from which the Take-off Flight Path begins.

2.1 In Performance Class 1 this specified point is defined as "the end of the Take-off Distance Required".

2.2 In Performance Class 2 this specified point is defined as "DPATO or, as an alternative, no later than 200 ft above the take-off surface".

2.3 There is no simple equivalent point for bounding of the landing in Performance Class 1 & 2.

3. Take-off Flight Path is not used in Performance Class 3 and, consequently, the term 'take-off and landing phases' is used to bound the limit of exposure. For the purpose of Performance Class 3, the takeoff and landing phases are considered to be bounded by:

for the take-off no later than Vy or 200 ft above the take-off surface; and

for the landing 200 ft above the landing surface.

Note: in ICAO Annex 6 Part III, En- route phase is defined as being "That part of the flight from the end of the take-off and initial climb phase to the commencement of the approach and landing phase. " The use of take-off and landing phase in this text is used to distinguish the take-off from the initial climb, and the landing from the approach: they are considered to be complimentary and not contradictory.

4. Ground level exposure – and exposure for elevated heliports or landing locations/helidecks in a non-hostile environment – is permitted for operations under an approval in accordance with Appendix 1 to ANTR-OPS 3.517(a). Exposure in this case is limited to the 'take-off and landing phases'. What is the practical effect of this bounding of exposure? Consider a couple of examples:

A clearing: the operator may consider a take-off/landing in a clearing when there is sufficient power, with all engines operating, to clear all obstacles in the take-off path by an adequate margin (this, in ICAO, is meant to indicate 35 ft). Thus, the clearing may be bounded by bushes, fences, wires and, in the extreme, by power lines, high trees etc. Once the obstacle has been cleared – by using a steep or a vertical climb (which itself may infringe the HV diagram) - the helicopter reaches Vy or 200 ft, and from that point a safe forced landing must be possible. The effect is that whilst operation to a clearing is possible, operation to a clearing in the middle of a forest is not (except when operated in accordance with Appendix 1 to ANTR-OPS 3.005(e)).

A heliport or landing location surrounded by rocks: the same applies when operating to a landing site that is surrounded by rocky ground. Once Vy or 200ft has been reached, a safe forced landing must be possible.

An elevated heliport or landing location/helideck: when operating to an elevated heliport or landing location/helideck in Performance Class 3, exposure is considered to be twofold: firstly, to a deck-edge strike if the engine fails after the decision to transition has been taken; and secondly, to operations in the HV diagram due to the height of the heliport or landing location/helideck. Once the take-off surface has been cleared and the helicopter has reached the knee of the HV diagram, the helicopter should be capable of making a safe forced landing.

5. Operation in accordance with ANTR-OPS 3.540(b) does not permit excursions into a hostile environment per se and is specifically concerned with the absence of space to abort the take-off or landing when the take-off and landing space are limited; or when operating in the HV diagram.

6. Specifically, the use of this exception to the requirement for a safe forced landing (during take-off or landing) does not permit semi-continuous operations over a hostile environment such as a forest or hostile sea area. It can therefore be seen as a limited alleviation from ANTR-OPS 3.540(a)(2) which states that: "operations are only

conducted to/from those heliports or landing locations and over such routes, areas and diversions contained in a non-hostile environment".

AC/AMC/IEM J – MASS & BALANCE

AC OPS 3.605
Mass values
See ANTR OPS 3.605

In accordance with ICAO Annex 5 and the International System of Units (SI), the actual and limiting masses of helicopters, the payload and its constituent elements, the fuel load etc, are expressed inANTR OPS 3 in units of mass (kg). However, in most approved Flight Manuals and other operational documentation, these quantities are published as weights in accordance with the common language. In the SI system, a weight is a force rather than a mass. Since the use of the term 'weight' does not cause any problem in the day-to-day handling of helicopters, its continued use in operational applications and publications is acceptable.

IEM OPS 3.605(e)
Fuel density
See ANTR OPS 3.605(e)

1 If the actual fuel density is not known, the operator may use the standard fuel density values specified in the Operations Manual for determining the mass of the fuel load. Such standard values should be based on current fuel density measurements for the airports or areas concerned. Typical fuel density values are:

a.	Gasoline (piston engine fuel)	-	0·71
b.	Jet fuel JP 1	-	0·79
c.	Jet fuel JP 4	-	0·76
d.	Oil	-	0·88

IEM to Appendix 1 to ANTR OPS 3.605, sub-paragraph (a)(2)(iii)
Accuracy of weighing equipment
See Appendix 1 to ANTR OPS 3.605, sub-paragraph (a)(2)(iii)

1 The mass of the helicopter as used in establishing the dry operating mass and the centre of gravity must be established accurately. Since a certain model of weighing equipment is used for initial and periodic weighing of helicopters of widely different mass classes, one single accuracy criterion for weighing equipment cannot be given. However, the weighing accuracy is considered satisfactory if the following accuracy criteria are met by the individual scales/cells of the weighing equipment used:

a.	For a scale/cell load below 2,000 kg	-	an accuracy of ± 1%;
b.	For a scale/cell load from 2,000 kg to 20,000 kg	-	an accuracy of ± 20 kg; and
c.	For a scale/cell load above 20,000 kg	-	an accuracy of ± 0·1 %.

IEM to Appendix 1 to ANTR OPS 3.605, sub-paragraph (d)
Centre of gravity limits
See Appendix 1 to ANTR OPS 3.605, sub-paragraph (d)

1 In the Certificate Limitations section of the Helicopter Flight Manual, forward and aft centre of gravity (CG) limits are specified. These limits ensure that the certification stability and control criteria are met throughout the whole flight. The operator should ensure that these limits are observed by defining operational procedures or a CG envelope which compensates for deviations and errors as listed below:

1.1 Deviations of actual CG at empty or operating mass from published values due, for example, to weighing errors, unaccounted modifications and/or equipment variations.

1.2 Deviations in fuel distribution in tanks from the applicable schedule.

1.3 Deviations in the distribution of baggage and cargo in the various compartments as compared with the assumed load distribution as well as inaccuracies in the actual mass of baggage and cargo.

1.4 Deviations in actual passenger seating from the seating distribution assumed when preparing the mass and balance documentation. (See Note)

1.5 Deviations of the actual CG of cargo and passenger load within individual cargo compartments or cabin sections from the normally assumed mid position.

1.6 Deviations of the CG caused by application of the prescribed fuel usage procedure (unless already covered by the certified limits).

1.7 Deviations caused by in-flight movement of cabin crew, pantry equipment and passengers.

NOTE: Large CG errors may occur when 'free seating' (freedom of passengers to select any seat when entering the helicopter) is permitted. Although in most cases reasonably even longitudinal passenger seating can be expected, there is a risk of an extreme forward or aft seat selection causing very large and unacceptable CG errors (assuming that the balance calculation is done on the basis of an assumed even distribution). The largest errors may occur at a load factor of approximately 50% if all passengers are seated in either the forward or aft half of the cabin. Statistical analysis indicates that the risk of such extreme seating adversely affecting the CG is greatest on small helicopters.

AMC OPS 3.620(a)
Passenger mass established by use of a verbal statement
See ANTR OPS 3.620(a)

1 When asking each passenger on helicopters with less than 6 passenger seats for his/her mass (weight), a specific constant should be added to account for clothing. This constant should be determined by the operator on the basis of studies relevant to his particular routes, etc. and should not be less than 4 kg.

2 Personnel boarding passengers on this basis should assess the passenger's stated mass and the mass of passengers' clothing to check that they are reasonable. Such personnel should have received instruction on assessing these mass values.

IEM OPS 3.620(h)
Statistical evaluation of passenger and baggage mass data
See ANTR OPS 3.620(h)

1 Sample size (see also Appendix 1 to ANTR OPS 3.620(h)).

1.1 For calculating the required sample size it is necessary to make an estimate of the standard deviation on the basis of standard deviations calculated for similar populations or for preliminary surveys. The precision of a sample estimate is calculated for 95% reliability or 'significance', i.e. there is a 95% probability that the true value falls within the specified confidence interval around the estimated value. This standard deviation value is also used for calculating the standard passenger mass.

1.2 As a consequence, for the parameters of mass distribution, i.e. mean and standard deviation, three cases have to be distinguished:

a. μ, σ = the true values of the average passenger mass and standard deviation, which are unknown and whichare to be estimated by weighing passenger samples.

b. μ', σ' = the 'a priori' estimates of the average passenger mass and the standard deviation, i.e. values resulting from an earlier survey, which are needed to determine the current sample size.

c. , s = the estimates for the current true values of m and s, calculated from the sample.

The sample size can then be calculated using the following formula:

where:

$$n = \frac{(1{\cdot}96 * XT' * 100)^2}{(e'_r * \mu')^2}$$

n = number of passengers to be weighed (sample size)

e'_r = allowed relative confidence range (accuracy) for the estimate of μ by (see also equation in paragraph 3).

NOTE: The allowed relative confidence range specifies the accuracy to be achieved when estimating the true mean. For example, if it is proposed to estimate the true mean to within ± 1%, then e'_r will be 1 in theabove formula.

1·96 = value from the Gaussian distribution for 95% significance level of the resulting confidence interval.

2 Calculation of average mass and standard deviation. If the sample of passengers weighed is drawn at random, then the arithmetic mean of the sample () is an unbiased estimate of the true average mass (µ) of the population.

2.1 Arithmetic mean of sample

$$\bar{x} = \frac{\sum_{j=1}^{n} x_j}{n}$$

where:

x_j = mass values of individual passengers (sampling units).

2.2 Standard deviation

$$s = \sqrt{\frac{\sum_{j=1}^{n} (x_j - \bar{x})^2}{n-1}}$$

where:

$x_j -$ = deviation of the individual value from the sample mean.

3 Checking the accuracy of the sample mean. The accuracy (confidence range) which can be ascribed to the sample mean as an indicator of the true mean is a function of the standard deviation of the sample which has to be checked after the sample has been evaluated. This is done using the formula:

$$e_r = \frac{1.96 * s * 100}{\sqrt{n} * \bar{x}} \ (\%)$$

whereby e_r should not exceed 1% for an all adult average mass and not exceed 2% for an average male and/or female mass. The result of this calculation gives the relative accuracy of the estimate of µ at the 95% significance level. This means that with 95% probability, the true average mass µ lies within the interval:

$$\bar{x} \pm \frac{1.96 * s}{\sqrt{n}}$$

4 Example of determination of the required sample size and average passenger mass

4.1 Introduction. Standard passenger mass values for mass and balance purposes require passenger weighing programs be carried out. The following example shows the various steps required for establishing the sample size and evaluating the sample data. It is provided primarily for those who are not well-versed in statistical computations. All mass figures used throughout the example are entirely fictitious.

4.2 Determination of required sample size. For calculating the required sample size, estimates of the standard (average) passenger mass and the standard deviation are needed. The 'a priori' estimates from an earlier survey may be used for this purpose. If such estimates are not available, a small representative sample of about 100 passengers has to be weighed so that the required values can be calculated. The latter has been assumed for the example.

Step 1: estimated average passenger massStep 2: estimated standard deviation

n	x_j (kg)
1	79.9
2	68.1
3	77.9
4	74.5
5	54.1
6	62.2
7	89.3
8	108.7
85	63.2
86	75.4

n	x_j	$(x_j - x)$	$(xj - x)^2$
1	79.9	+9.3	86.49
2	68.1	–2.5	6.25
3	77.9	+7.3	53.29
4	74.5	+3.9	15.21
5	54.1	–16.5	272.25
6	62.2	–8.4	70·56
7	89.3	+18.7	349.69
8	108.7	+38.1	1451.61
85	63.2	–7.4	54.76
86	75.4	–4.8	23.04

$\sum_{j=1}^{86}$ 6071.6 $\sum_{j=1}^{86}$ 6071.6 34 683.40

$$\mu' = \bar{x} = \frac{\sum x_j}{n} = \frac{6071 \cdot 6}{86}$$

$$= 70{\cdot}6 \text{ kg}$$

$$\sigma' = \sqrt{\frac{\sum (x_j - \bar{x})^2}{n-1}}$$

$$\sigma' = \sqrt{\frac{34\,683 \cdot 40}{86-1}}$$

$$\sigma' = 20{\cdot}20 \text{ kg}$$

Step 3: required sample size.

The required number of passengers to be weighed should be such that the confidence range, e'_r, does not exceed 1% as specified in paragraph 3.

$$n \geq \frac{(1 \cdot 96 * \sigma' * 100)^2}{(e'_r * \mu')^2}$$

$$n \geq \frac{(1 \cdot 96 * 20 \cdot 20 * 100)^2}{(1 * 70 \cdot 6)^2}$$

$$n \geq 3145$$

The result shows that at least 3145 passengers have to be weighed to achieve the required accuracy. If e'_r is chosen as 2% the result would be n ≥ 786.

Step 4: after having established the required sample size a plan for weighing the passengers is to be worked out, as specified in Appendix 1 to ANTR OPS 3.620(h).

4.3 Determination of the passenger average mass

Step 1: Having collected the required number of passenger mass values, the average passenger mass can be calculated. For the purpose of this example it has been assumed that 3180 passengers were weighed. The sum of the individual masses amounts to 231186·2 kg.

$$n = 3180$$

$$\sum_{j=1}^{3180} X_j = 231186 \cdot 2 \quad \text{kg}$$

$$\bar{x} = \frac{\sum x_j}{n} = \frac{231186 \cdot 2}{3180} \quad \text{kg}$$

$$\bar{x} = 72 \cdot 7 \quad \text{kg}$$

Step 2: calculation of the standard deviation.

For calculating the standard deviation the method shown in paragraph 4.2 step 2 should be applied.

$$\sum (x_j - \bar{x})^2 = 745\,145 \cdot 20$$

$$s = \sqrt{\frac{\sum (x_j - \bar{x})^2}{n-1}}$$

$$s = \sqrt{\frac{745\,145 \cdot 20}{3180 - 1}}$$

$$s = 15{\cdot}31 \text{ kg}$$

Step 3: calculation of the accuracy of the sample mean.

$$e_r = \frac{1 \cdot 96 * s * 100}{\sqrt{n} * \bar{x}} \%$$

$$e_r = \frac{1{\cdot}96 * 15{\cdot}31 * 100}{\sqrt{3180} * 72{\cdot}7}\ \%$$

e_r = 0·73%

Step 4: calculation of the confidence range of the sample mean.

$$\bar{x} \pm \frac{1{\cdot}96 * s}{\sqrt{n}}$$

$$\bar{x} \pm \frac{1{\cdot}96 * 15{\cdot}31}{\sqrt{3180}}\ \text{kg}$$

72·7 ± 0·5 kg

The result of this calculation shows that there is a 95% probability of the actual mean for all passengers lying within the range 72·2 kg to 73·2 kg.

AMC to Appendix 1 to ANTR OPS 3.620(h), sub-paragraph (c)(4)
Guidance on passenger weighing surveys
See Appendix 1 to ANTR OPS 3.620(h), sub-paragraph (c)(4)

1 Operators seeking approval to use standard passenger masses differing from those prescribed in ANTR OPS 3.620, Tables 1 and 2, on similar routes or networks may pool their weighing surveys provided that:

a. The BCAA has given prior approval for a joint survey;

b. The survey procedures and the subsequent statistical analysis meet the criteria of Appendix 1 to ANTR OPS 3.620(h); and

c. In addition to the joint weighing survey results, results from individual operators participating in the joint survey should be separately indicated in order to validate the joint survey results.

IEM to Appendix 1 to ANTR OPS 3.620(h)
Guidance on passenger weighing surveys
See Appendix 1 to ANTR OPS 3.620(h)

1 This IEM summarises several elements of passenger weighing surveys and provides explanatory and interpretative information.

2 Information to the BCAA. The operator should advise the BCAA about the intent of the passenger weighing survey, explain the survey plan in general terms and obtain prior approval to proceed (ANTR OPS 3.620(h) refers).

3 Detailed survey plan

3.1 The operator should establish and submit for approval to the BCAA a detailed weighing survey plan that is fully representative of the operation, i.e. the network or route under consideration and the survey should involve the weighing of an adequate number of passengers (ANTR OPS 3.620(h)).

3.2 A representative survey plan means a weighing plan specified in terms of weighing locations, dates and flight numbers giving a reasonable reflection of the operator's timetable and/or area of operation (See Appendix 1 to ANTR OPS 3.620(h), sub-paragraph (a)(1)).

3.3 The minimum number of passengers to be weighed is the highest of the following (See Appendix 1 to ANTR OPS 3.620(h) sub-paragraph (a)):

a. The number that follows from the general requirement that the sample should be representative of the total operation to which the results will be applied; this will often prove to be the overriding requirement; or

b. The number that follows from the statistical requirement specifying the accuracy of the resulting mean values which should be at least 2% for male and female standard masses and 1% for all adult standard masses, where applicable. The required sample size can be estimated on the basis of a pilot sample (at least 100 passengers) or from a previous survey. If analysis of the results of the survey indicates that the requirements on the accuracy of the mean values for male or female standard masses or all adult standard masses, as applicable, are not met, an additional number of representative passengers should be weighed in order to satisfy the statistical requirements.

3.4 To avoid unrealistically small samples a minimum sample size of 2000 passengers (males + females) is also required, except for small helicopters where in view of the burden of the large number of flights to be weighed to cover 2000 passengers, a lesser number is considered acceptable.

4 Execution of weighing programme

4.1 At the beginning of the weighing programme it is important to note, and to account for, the data requirements of the weighing survey report (See paragraph 7 below).

4.2 As far as is practicable, the weighing programme should be conducted in accordance with the specified survey plan.

4.3 Passengers and all their personal belongings should be weighed as close as possible to the boarding point and the mass, as well as the associated passenger category (male/female/child), should be recorded.

5 Analysis of results of weighing survey

5.1 The data of the weighing survey should be analysed as explained in IEM OPS 3.620(h). To obtain an insight to variations per flight, per route etc. this analysis should be carried out in several stages, i.e. by flight, by route, by area, inbound/outbound, etc. Significant deviations from the weighing survey plan should be explained as well as their possible effect(s) on the results.

6 Results of the weighing survey

6.1 The results of the weighing survey should be summarised. Conclusions and any proposed deviations from published standard mass values should be justified. The results of a passenger weighing survey are average masses for passengers, including hand baggage, which may lead to proposals to adjust the standard mass values given in ANTR OPS 3.620 Tables 1, 2 and 3. As stated in Appendix 1 to ANTR OPS 3.620(h), sub-paragraph (c), these averages, rounded to the nearest whole number may, in principle, be applied as standard mass values for males and females on helicopters with 20 and more passenger seats. Because of variations in actual passenger masses, the total passenger load also varies and statistical analysis indicates that the risk of a significant overload becomes unacceptable for helicopters with less that 20 seats. This is the reason for passenger mass increments on small helicopters.

6.2 The average masses of males and females differ by some 15 kg or more and because of uncertainties in the male/female ratio the variation of the total passenger load is greater if all adult standard masses are used than when using separate male and female standard masses. Statistical analysis indicates that the use of all adult standard mass values should be limited to helicopters with 30 passenger seats or more.

6.3 As indicated in Appendix 1 to ANTR OPS 3.620(h), standard mass values for all adults must be based on the averages for males and females found in the sample, taking into account a reference male/female ratio of 80/20 for all flights. The operator may, based on the data from his weighing programme, or by proving a different male/female ratio, apply for approval of a different ratio on specific routes or flights.

7 Weighing survey report

7.1 The weighing survey report, reflecting the content of paragraphs 1–6 above, should be prepared in a standard format as follows:

WEIGHING SURVEY REPORT

1 Introduction

Objective and brief description of the weighing survey

2 Weighing survey plan

Discussion of the selected flight number, heliports or landing locations, dates, etc.

Determination of the minimum number of passengers to be weighed.

Survey plan.

3 Analysis and discussion of weighing survey results

Significant deviations from survey plan (if any).

Variations in means and standard deviations in the network.

Discussion of the (summary of) results.

4 Summary of results and conclusions

Main results and conclusions.

Proposed deviations from published standard mass values.

Attachment 1

Applicable summer and/or winter timetables or flight programmes.

Attachment 2

Weighing results per flight (showing individual passenger masses and sex); means and standard deviations per flight, per route, per area and for the total network.

IEM OPS 3.620(i) & (j)
Adjustment of standard masses
See ANTR OPS 3.620(i) & (j)

1. When standard mass values are used, ANTR OPS 3.620(i) and 3.620(j) require the operator to identify and adjust the passenger and checked baggage masses in cases where significant numbers of passengers or quantities of baggage are suspected of exceeding the standard values. This requirement implies that the Operations Manual should contain appropriate directives to ensure that:

a. Check-in, operations and cabin staff and loading personnel report or take appropriate action when a flight is identified as carrying a significant number of passengers whose masses, including hand baggage, are expected to exceed the standard passenger mass, and/or groups of passengers carrying exceptionally heavy baggage (e.g. military personnel or sports teams); and

b. On small helicopters, where the risks of overload and/or CG errors are the greatest, commanders pay special attention to the load and its distribution and make proper adjustments.

IEM to Appendix 1 to ANTR OPS 3.625
Mass and balance documentation
See Appendix 1 to ANTR OPS 3.625

The CG position need not be mentioned on the mass and balance documentation if, for example, the load distribution is in accordance with a pre-calculated balance table or if it can be shown that for the planned operations a correct balance can be ensured, whatever the real load is.

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AC/AMC/IEM K – INSTRUMENTS, EQUIPMENT AND FLIGHT DOCUMENTS

IEM OPS 3.630
Instruments and Equipment - Approval and Installation
See ANTR OPS 3.630

1 For Instruments and Equipment required by ANTR OPS 3 Subpart K, “Approved” means that compliance with the applicable TSO design requirements and performance specifications, or equivalent, in force at the time of the equipment approval application, has been demonstrated. Where a TSO does not exist, the applicable airworthiness standards apply unless otherwise prescribed in ANTR OPS 3 or ANTR- M.

2 “Installed” means that the installation of Instruments and Equipment has been demonstrated to complywith the applicable airworthiness requirements of ~~CFR 14 PART 27/ 29 or CS-27/CS-29~~, the respective Certification Specification / TCDS as accepted by BCAA for the respective category helicopters or the relevant code used for Type Certification, and any applicable requirement prescribed in ANTR OPS 3.

3 Instruments and Equipment approved in accordance with design requirements and perform ance specifications other than TSOs, before the applicability dates prescribed in ANTR OPS 3.001(b), are acceptable for use or installation on helicopters operated for the purpose of commercial airtransportation provided that any additional OPS requirement is complied with.

4 When a new version of a TSO (or of a specification other than a TSO) is issued, Instruments and Equipment approved in accordance with earlier requirements may be used or installed on helicopters operated for the purpose of commercial air transportation provided that such Instruments and Equ ipment are operational, unless removal from service or withdrawal is required by means of an amendment to ANTR OPS 3 or ANTR M.

IEM OPS 3.647
Equipment for operations requiring a radio communication and/or radio navigation system
See ANTR OPS 3.647

A headset, as required by ANTR OPS 3.647, consists of a communication device which includes two earphones to receive and a microphone to transmit audio signals to the helicopter’s communication system. To comply with the minimum performance requirements, the earphones and microphone should match with the communication system’s characteristics and the flight deck environment. The headset should be adequately adjustable to fit the pilot’s head. Headset boom microphones should be of the noise cancelling type.

AMC OPS 3.650/3.652
Flight and Navigational Instruments and Associated Equipment
See ANTR OPS 3.650/3.652

1 Individual requirements of these paragraphs may be met by combinations of instruments or by integrated flight systems or by a combination of parameters on electronic displays provided that the information so available to each required pilot is not less than that provided by the instruments and associated equipment as specified in this Subpart.

2 The equipment requirements of these paragraphs may be met by alternative means of compliance when equivalent safety of the installation has been shown during type certification approval of the helicopter for the intended kind of operation.

IEM OPS 3.650/3.652
Flight and Navigational Instruments and Associated Equipment
See ANTR OPS 3.650/3.652

	FLIGHTS UNDER VFR		FLIGHTS UNDER IFR OR AT NIGHT	
INSTRUMENT	SINGLE PILOT	TWO PILOTS REQUIRED	SINGLE PILOT	TWO PILOTS REQUIRED
(a)	(b)	(c)	(d)	(e)
1 Magnetic Direction Indicator	1	1	1	1
2 Accurate Time Piece	1	1	1	1
3 OAT Indicator	1	1	1	1
4 Sensitive Pressure Altimeter	1	2	2 (Note 1)	2
5 Air Speed Indicator	1	2	1	2
6 Heated Pitot System	1 (Note 2)	2 (Note 2)	1	2
7 Pitot Heat Failure Annuciator	-	-	1 (Note 3)	2 (Note 3)
8 Vertical Speed Indicator	1	2	1	2
9 Slip Indicator	1	2	1	2
10 Attitude Indicator	1 (Note 4 or Note 5)	2 (Note 4 or Note 5)	1 (Note 8)	2 (Note 8)
11 Gyroscopic Direction Indicator	1 (Note 4 or Note 5)	2 (Note 4 or Note 5)	1 (Note 8)	2 (Note 8)
12 Magnetic Gyroscopic Direction Indicator	-	-	1 (Note 7)	2 (Note 7)
13 Standby Attitude Indicator	-	-	1 (Note 6)1	1 (Note 6)
14 Alternate Source of Static Pressure	-	-	1	1
15 Chart Holder	-	-	1 (Note 7)	1 (Note 7)

NOTE 1: For single pilot night vfr operation one sensitive pressure altimeter may be substituted by a radio altimeter (ANTROPS 3.652(c)).

NOTE 2: Required for helicopters with a maximum certificated take-off mass (MCTOM) over 3 175 kg or having a maximum approved passenger seating configuration (MAPSC) of more than 9 (ANTR-OPS 3.650(l)).

NOTE 3: The pitot heater failure annunciation applies to any helicopter issued with an individual Certificate of Airworthiness after 1 August 1999. It also applies before that date when: the helicopter has a MCTOM greater than 3 175 kg and a maximum approved passenger seating configuration (MAPSC) greater than 9 (ANTR-OPS 3.652(d)).

NOTE 4: Required for helicopters with a maximum certificated take-off mass (MCTOM) over 3 175 kg (ANTR OPS 3.650(i)).

NOTE 5: Required for any helicopters when operating over water; when out of sight of land or when the visibilityis less than 1500 m (ANTR-OPS 3.650(i)).

NOTE 6: For helicopters with a maximum certificated take-off mass (MCTOM) over 3 175 kg, CS-29 1303(g) may require either a gyroscopic rate-of-turn indicator combined with a slip-skid indicator (turn and bank indicator) or a standby attitude indicator satisfying the requirements of ANTR-OPS 3.652(h). (However, the original type certification standard should be referred to determine the exact requirement.)

NOTE 7: For IFR operation only

NOTE 8: For VFR night operations only.

AMC OPS 3.650(g) & 3.652(k)
Flight and Navigational Instruments and Associated Equipment
See ANTR OPS 3.650(g) & 3.652(k)

A means to indicate outside air temperature may be an air temperature indicator which provides indications that are convertible to outside air temperature.

AMC OPS 3.652(d) & (m)(2)
Flight and Navigational Instruments and Associated Equipment
See ANTR OPS 3.652(d) & (m)(2)

A combined pitot heater warning indicator is acceptable provided that a means exists to identify the failed heater in systems with two or more sensors.

AMC OPS 3.655
Procedures for single pilot operation under IFR without an autopilot.
See ANTR OPS 3.655

1 Operators approved to conduct single pilot IFR operations in a helicopter without altitude hold and heading mode, should establish procedures to provide equivalent safety levels. These procedures should include the following:

a. Appropriate training and checking additional to that contained in Appendix 1 to ANTR OPS 3.940(c).

b. Appropriate increments to the heliport or landing location operating minima contained in Appendix 1 to ANTR OPS 3.430.

2 Any sector of the flight which is to be conducted in IMC should not be planned to exceed 45 minutes.

AMC OPS 3.690(b)(6)
Crew member interphone system
See ANTR OPS 3.690(b)(6)

1 The means of determining whether or not an interphone call is a normal or an emergency call may be one or a combination of the following:

i. Lights of different colours;

ii. Codes defined by the operator (e.g. Different number of rings for normal and emergency calls);

iii. Any other indicating signal acceptable to the BCAA.

IEM OPS 3.700
Flight Recorders
See ANTR OPS 3.700

Since 1973, and the inclusion in Annex 6 of SARPs for the carriage of flight recorders, new and revised requirements were introduced concerning flight recorders. These amendments include an update of the provisions pertaining to flight recorders, recording of digital communications, FDR requirements for new aircraft, revised parameter listings, and two-hour duration CVRs. Through the years, the applicability date and the carriage of flight recorders to be installed, as defined by the SARPs, are quite complex.

The tables below summarize the flight recorders carriage requirements for helicopters.

Table 1. SARPs for the recording of flight parameters in Section II

Date	Maximum certificated take-off mass (MCTOM)			
	Seating configuration of more than 19 passengers or over 7000 kg	Over 3175 kg	Over 2250 kg up to 3175 kg	Less than 3175 kg
	All helicopters first certificate of airworthiness	All helicopters first certificate of airworthiness	All turbine helicopters new type certificate	All helicopters first certificate of airworthiness
1989 →	ANTR OPS 3.705(a)(2)	ANTR OPS 3.705(a)(3)		
2016 →	ANTR OPS 3.705(a)(1)			
2018 →			ANTR OPS 3.705(a)(4)	ANTR OPS 3.705(a)(5)

Table 2. SARPs for the recording of flight parameters in Section III

Date	Maximum certificated take-off mass (MCTOM)	
	Seating configuration of more than 19 passengers or over 7000 kg	Over 3175 kg
	All helicopters first certificate of airworthiness	All helicopters first certificate of airworthiness
1989 →	ANTR OPS 3.705(a)(2)	ANTR OPS 3.705(a)(3)
2016 →	ANTR OPS 3.705(a)(1)	ANTR OPS 3.705(a)(1)

Table 3. CVR/CARS installation SARPs in Section II and Section III

Date	Maximum certificated take-off mass (MCTOM)	
	Over 7 000 kg	Over 3175 kg
	All helicopters	All helicopters first certificate of airworthiness
1987 →	ANTR OPS 3.710(a)	ANTR OPS 3.710(b)

AC OPS 3.700(b)
Combination Recorder
See ANTR OPS 3.700, 3.705, 3.715, 3.720

Compliance with Cockpit Voice Recorder and Flight Data Recorder requirements may be achieved by the carriage of a combination recorder.

AC OPS 3.715/3.720
Flight Data Recorders - 1 and 2
See ANTR OPS 3.715/3.720

1. Account should be taken of the operational performance requirements of EUROCAE Document ED-112, ED56A (Minimum Operational Performance Specification For Flight Data Recorder Systems).

2. The parameters to be recorded should meet, as far as practicable, the performance specifications (designated ranges, sampling intervals, accuracy limits and minimum resolution in read-out) defined inthe relevant tables of EUROCAE Minimum Operational Performance Specification for Flight Data Recorder Systems, Document ED-112, ED56A. The remarks columns of those tables are acceptable means of compliance to the parameter specifications.

IEM OPS 3.740
Placards
(See ANTR OPS 3.740)

The markings required must:

a be painted, or affixed by other equally permanent means;

b be red in colour, and in any case in which the colour of the adjacent back-ground is such as to render red markings not readily visible, be outlined in white or some other contrasting colour in such a manner as to render them readily visible;

c be kept at all times clean and un-obscured.

AMC OPS 3.745
First-Aid Kits
See ANTR OPS 3.745

The following should be included in the First-Aid Kits:

Bandages (unspecified)
Burns dressings (unspecified)
Wound dressings, large and small
Safety pins and scissors
Small adhesive dressings
Antiseptic wound cleaner
Adhesive wound closures
Adhesive tape
Disposable resuscitation aid
Simple analgesic e.g. paracetamol
Antiemetic e.g. cinnarizine
Nasal decongestant
First-Aid handbook
Splints, suitable for upper and lower limbs
Gastrointestinal Antacid +
Anti-diarrhoeal medication e.g. Loperamide +
Ground/Air visual signal code for use by survivors.
Disposable Gloves
A list of contents in at least 2 languages (English and one other). This should include information on the effects and side effects of drugs carried.

Note: An eye irrigator whilst not required to be carried in the first-aid kit should, where possible, be available for use on the ground.

\+ *For helicopters with more than 9 passenger seats installed.*

AMC OPS 3.750
Universal Precaution Kit
See ANTR OPS 3.750

The Universal Protection Kit shall contain as a minimum the following:

Dry powder that can convert a small liquid spill into a sterile granulated gel

Germicidal disinfectant for surface cleaning

Skin wipes

Face/eye mask (separate or combined)

Gloves (disposable)

Protective apron

Large absorbent towel

Pick-up scoop with scraper

Bio-hazard disposal waste bag

Instructions

AMC OPS 3.790
Hand Fire Extinguishers
See ANTR OPS 3.790

1 The number and location of hand fire extinguishers should be such as to provide adequate availability for use, account being taken of the number and size of the passenger compartments, the need to minimise the hazard of toxic gas concentrations and the location of toilets, galleys etc. These considerations may result in the number being greater than the minimum prescribed.

2 There should be at least one fire extinguisher suitable for both flammable fluid and electrical equipment fires installed on the flight deck. Additional extinguishers may be required for the protection of other compartments accessible to the crew in flight. Dry chemical fire extinguishers should not be used on the flight deck, or in any compartment not separated by a partition from the flight deck, because of the adverse effect on vision during discharge and, if non-conductive, interference with electrical contacts by the chemical residues.

3 Where only one hand fire extinguisher is required in the passenger compartments it should be located near the cabin crew member’s station, where provided.

4 Where two or more hand fire extinguishers are required in the passenger compartments and their location is not otherwise dictated by consideration of paragraph 1 above, an extinguisher should be located near each end of the cabin with the remainder distributed throughout the cabin as evenly as is practicable.

5 Unless an extinguisher is clearly visible, its location should be indicated by a placard or sign. Appropriate symbols may be used to supplement such a placard or sign.

AMC OPS 3.810
Megaphones
See ANTR OPS 3.810

Where one megaphone is required, it should be readily accessible from a cabin crew member’s assigned seat. Where two or more megaphones are required, they should be suitably distributed in the passenger cabin(s) and readily accessible to crew members assigned to direct emergency evacuations. This does not necessarily require megaphones to be positioned such that they can be reached by a crew member when strapped in a cabin crew member’s seat.

IEM OPS 3.820
Automatic Emergency Locator Transmitter
See ANTR OPS 3.820

1 Types of automatic Emergency Locator Transmitters are defined as follows:

a. Automatic Fixed (ELT (AF)). This type of ELT is intended to be permanently attached to the helicopter before and after a crash and is designed to aid SAR teams in locating a crash site;

b. Automatic Portable (ELT (AP)). This type of ELT is intended to be rigidly attached to the helicopter before a crash, but readily removable from the helicopter after a crash. It functions as an ELT during the crash sequence. If the ELT does not employ an integral antenna, the aircraft-mounted antenna may be disconnected and an auxiliary antenna (stored on the ELT case) attached to the ELT. The ELT can be tethered to a survivor or a life-raft. This type of ELT is intended to aid SAR teams in locating the crash site or survivor(s);

c. Automatic Deployable (ELT (AD)). This type of ELT is intended to be rigidly attached to the helicopter before the crash and automatically ejected and deployed after the crash sensor has determined that a crash has occurred. This type of ELT should float in water and is intended to aid SAR teams in locating the crash site.

2 To minimise the possibility of damage in the event of crash impact, the Automatic Emergency Locator Transmitter should be rigidly fixed to the helicopter structure as far aft as practicable with its antenna and connections so arranged as to maximise the probability of the signal being radiated after a crash.

IEM OPS 3.825
Life Jackets
See ANTR OPS 3.825

For the purpose of ANTR OPS 3.825, seat cushions are not considered to be flotation devices.

IEM OPS 3.827
Crew Survival Suits – Estimating Survival Time
See ANTR OPS 3.827

1 Introduction

1.1 A person accidentally immersed in cold seas (typically offshore Northern Europe) will have a better chance of survival if he is wearing an effective survival suit in addition to a life -jacket. By wearing the survival suit, he can slow down the rate which his body temperature falls and protect himse lf form the greater risk of drowning brought about by incapacitation due to hypothermia.

1.2 The complete survival suit system – suit, life-jacket and clothes worn under the suit – should be able to keep the wearer alive long enough for the rescue services to find and recover him. In practice the limit is about 3 hours. If a group of persons in the water cannot be rescued within this time they are likely to have become so scattered and separated that location will be extremely difficult, especially in the r ough water typical of Northern European sea areas. If it is expected that in water protection is required for periods greater than 3 hours, improvements should be sought in the search and rescue procedures rather than in the immersion suit protection.

2 Survival times

2.1 The aim must be to ensure that a man in the water can survive long enough to be rescued, i.e. his survival time must be greater than the likely rescue time. The factors affecting both times are shown in Figure 1. The figure emphasises that survival time is influenced by many factors, physical and human. Some of the factors are relevant to survival in cold water, some are relevant in water at any temperature.

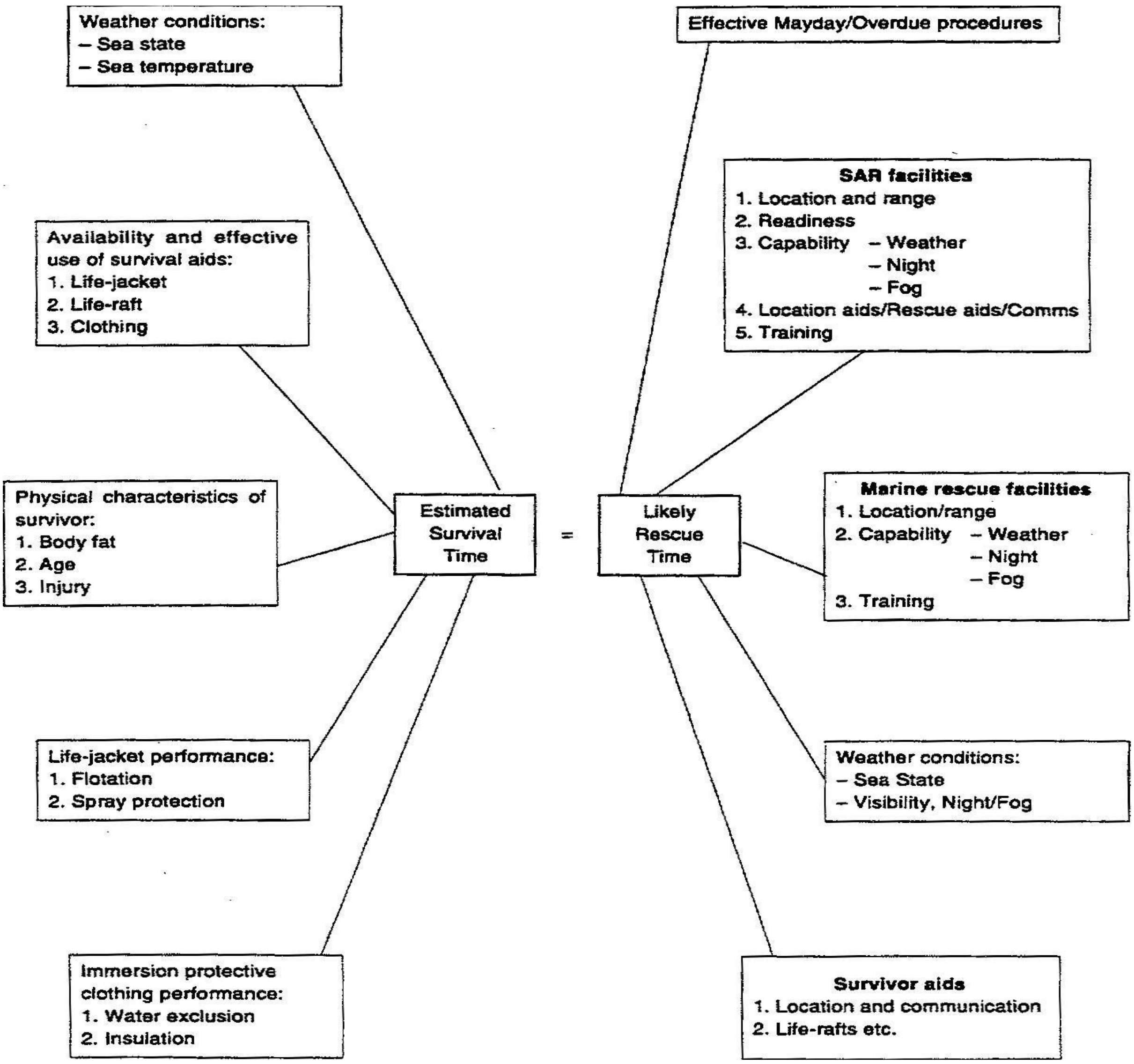

Fig. 1 The Survival Equation

2.2 Broad estimates of likely survival times for the thin offshore individual are given in Fig. 2. As survival time is significantly affected by the prevailing weather conditions at the time of immersion, the Beaufort wind scale has been used as an indicator of these surface conditions.

Clothing assembly	Beaufort wind force	Times within which the most vulnerable individuals are likely to drown	
		(water temp 5°c)	(water temp 13°c)
Working clothes (no immersion suit)	0 – 2 3 – 4 5 and above	Within ¾ hour Within ½ hour Significantly less than ½ hour	Within 1 ¼ hours Within ½ hour Significantly less than ½ hour
Immersion suit worn over working clothes (with leakage inside suit)	0 -2 3 – 4 5 and above	May well exceed 3 hours Within 2 ¾ hours Significantly less than 2 ¾ hours. May well exceed 1 hour	May well exceed 3 hours May well exceed 3 hours May well exceed 3 hours

2.3 Consideration must also be given to escaping from the helicopter itself should it submerge or invert in the water. In this case escape time is limited to the length of time the occupants can hold their breath. The breath hold time can be greatly reduced by the effect of cold shock. Cold shock is caused by the sudden drop in skin temperature on immersion, and is characterised by a gasp reflex and uncontrolled breathing.

The urge to breathe rapidly becomes overwhelming and, if still submerged, the individual will inhale water resulting in drowning. Delaying the onset of cold shock by wearing an immersion suit will extend the available escape time from a submerged helicopter.

2.4 The effects of water leakage and hydrostatic compression on the insulation quality of clothing are well recognised. In a nominally dry system the insulation is provided by still air trapped within the clothing fibres and between the layers of suit and clothes. It has been observed that many systems lose some of their insulative capacity either because the clothes under the 'waterproof' survival suit get wet to some extent or because of hydrostatic compression of the whole assembly. As a result of water leakage and compression, survival times will be shortened. [The wearing of warm clothing under the suit is recommended.]

2.5 Whatever type of survival suit and other clothing is provided, it should not be forgotten that significant heat loss can occur from the head.

AMC OPS 3.830(a)(2)
Life-rafts and ELT for extended overwater flights
See ANTR OPS 3.830(a)(2)

1 Each life-raft required by ANTR OPS 3.830 shall conform to the following specification:

a. They shall be of an approved design and stowed so as to facilitate their ready use in an emergency;

b. They shall be radar conspicuous to standard airborne radar equipment;

c. When carrying more than one life-raft on board, at least 50% shall be jettisonable by the crew while seated at their normal station, where necessary by remote control;

d. Those life-rafts which are not jettisonable by remote control or by the crew shall be of such weight as to permit handling by one person. 40 kg shall be considered a maximum weight.

2 Each life-raft required by ANTR OPS 3.830 shall contain at least the following:

a. One approved survivor locator light;

b. One approved visual signalling device;

c. One canopy (for use as a sail, sunshade or rain catcher;

d. One radar reflector;

e. One 20 m retaining line designed to hold the life-raft near the helicopter but to release it if the helicopter becomes totally submerged;

f. One sea anchor;

g. One survival kit, appropriately equipped for the route to be flown, which shall contain at least the following:

i. One life-raft repair kit;

ii. One bailing bucket;

iii. One signalling mirror;

iv. One police whistle;

v. One buoyant raft knife;

vi. One supplementary means of inflation;

vii. Seasickness tablets;

viii. One first-aid kit;

ix. One portable means of illumination;

x. One half litre of pure water and one sea water desalting kit;

xi. One comprehensive illustrated survival booklet in an appropriate language.

3 Batteries used in the ELTs should be replaced (or recharged, if the battery is rechargeable) when the equipment has been in use for more than 1 cumulative hour, and also when 50% of their useful life (or for rechargeable, 50% of their useful life of charge), as established by the equipment manufacturer has expired. The new expiration date for the replacement (or recharged) battery must be legibly marked on the outside of the equipment. The battery useful life (or useful life of charge) requirements of this paragraph do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals.

AMC OPS 3.830(a)(3)
Survival Emergency Locator Transmitter (ELT(S))
See ANTR OPS 3.830(a)(3)

1 A survival ELT (ELT(S)) is intended to be removed from the helicopter and activated by survivors of a crash. An ELT(S) should be stowed so as to facilitate its ready removal and use in an emergency. An ELT(S) may be activated manually or automatically (e.g. by water activation). It should be designed tobe tethered to a liferaft or a survivor.

IEM OPS 3.835
Survival Equipment
See ANTR OPS 3.835

1 The expression ‘Areas in which search and rescue would be especially difficult’ should be interpreted in the context of this ANTR as meaning:

a. Areas so designated by the State responsible for managing search and rescue; or

b. Areas that are largely uninhabited and where:

i. The State responsible for managing search and rescue has not published any information to confirm that search and rescue would not be especially difficult; and

ii. The State referred to in (a) above does not, as a matter of policy, designate areas as being especially difficult for search and rescue.

AMC OPS 3.835(c)
Survival Equipment
See ANTR OPS 3.835(c)

1 The following additional survival equipment should be carried when required:

a. 500 ml of water for each 4, or fraction of 4, persons on board;

b. One knife;

c. First Aid Equipment;

d. One set of Air/Ground codes;

In addition, when polar conditions are expected, the following should be carried:

e. A means for melting snow;

f. 1 snow shovel and 1 ice saw;

g. Sleeping bags for use by $^{1}/_{3}$ of all persons on board and space blankets for the remainder or space blankets for all passengers on board;

h. 1 Arctic/Polar suit for each crew member carried.

2 If any item of equipment contained in the above list is already carried on board the helicopter in accordance with another requirement, there is no need for this to be duplicated.

IEM OPS 3.837(a)(2)
Additional requirements for helicopters operating to helidecks located in a hostile sea area
See ANTR OPS 3.837

1 Operators should be aware that projections on the exterior surface of the helicopter, which are located in a zone delineated by boundaries which are 1.22 m (4 ft) above and 0.61 m (2 ft) below the established static water line could cause damage to a deployed liferaft. Examples of projections which need to be considered are aerials, overboard vents, unprotected split pin tails, guttering and any projection sharper than a three dimensional right angled corner.

2 While the boundaries specified in para 1 above are intended as a guide, the total area which should be considered should also take into account the likely behaviour of the liferaft afte r deployment in all sea states up to the maximum in which the helicopter is capable of remaining upright.

3 Operators and maintenance organisations are reminded that wherever a modification or alteration is made to a helicopter within the boundaries specified, the need to prevent the modification or alteration causing damage to a deployed liferaft should be taken into account in the design.

4 Particular care should also be taken during routine maintenance to ensure that additional hazards are not introduced by, for example, leaving inspection panels with sharp corners proud of the surrounding fuselage surface, or allowing door sills to deteriorate to a point where sharp edges become a hazard.

5 The same considerations apply in respect of emergency flotation equipment.

IEM OPS 3.843(c)
Flights overwater - Performance Class 2 take-off and landing
See ANTR OPS 3.843(c)

When helicopters are operated in Performance Class 2 and are taking-off or landing over water, they are exposed to a critical power unit failure. They should therefore be designed for landing on water, certificated in accordance with ditching provisions, or have the appropriate floats fitted (for a non -hostile environment).

AC/AMC/IEM L – COMMUNICATION, NAVIGATION AND SURVEILLANCE EQUIPMENT

IEM OPS 3.845
Communication and Navigation Equipment - Approval and Installation
See ANTR OPS 3.845

1 For Communication and Navigation Equipment required by ANTR OPS 3 Subpart L, “Approved” means that compliance with the applicable TSO design requirements and performance specifications, or equivalent, in force at the time of the equipment approval application, has been demonstrated. Where a TSO does not exist, the applicable airworthiness standards or equivalent apply unless otherwise prescribed in ANTR OPS 3 or ANTR M.

2 “Installed” means that the installation of Communication and Navigation Equipment has been demonstrated to comply with the applicable airworthiness requirements of ~~CFR 14 PART 27 / 29 or CS-27/CS-29~~, the respective Certification Specification / TCDS as accepted by BCAA for the respective Category Helicopters or the relevant code used for Type Certification, and any applicable requirement prescribed in ANTR OPS 3.

3 Communication and Navigation Equipment approved in accordance with design requirements and performance specifications other than TSOs, before the applicability dates prescribed in ANTR OPS 3.001(b), are acceptable for use or installation on helicopters operated for the purpose of commercialair transportation provided that any additional OPS requirement is complied with.

4 When a new version of a TSO (or of a specification other than a TSO) is issued, Communication and Navigation Equipment approved in accordance with earlier requirements may be used or installed on helicopters operated for the purpose of commercial air transportation provided that such Communication and Navigation Equipment are operational, unless removal from service or withdrawal is required bymeans of an amendment to ANTR OPS 3 or ANTR M. The same provisions apply in the case where an existing TSO (or a specification) is superseded by a new TSO (or a new specification).

AC OPS 3.865(e)
FM Immunity Equipment Standards
See ANTR OPS 3.865(e)

1 FM immunity performance Standards for ILS Localiser, VOR receivers and VHF communication receivers have been incorporated in ICAO Annex 10, Volume I - Radio Navigation Aids Fifth Edition dated July 1996, Chapter 3, Paragraphs 3.1.4, 3.3.8 and Volume III, Part II - Voice Communications Systems, Paragraph 2.3.3.

2 Acceptable equipment standards, consistent with ICAO Annex 10, are contained in EUROCAE Minimum Operational Performance Specifications, documents ED-22B for VOR receivers, ED-23B for VHF communication receivers and ED-46B for LOC receivers and the corresponding RTCA documents DO-186, DO-195 and DO-196.

Note: Operations within the Bahraini FIR do not require FM Immunity.

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AC/AMC/IEM M – HELICOPTER MAINTENANCE (Withdrawn)

This Subpart has been entirely withdrawn due to the implementation of ANTR M.

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AC/AMC/IEM N – FLIGHT CREW

AMC OPS 3.940(a)(4)
Crewing of inexperienced flight crew members
See ANTR OPS 3.940(a)(4)

1 The operator should consider that when two flight crew members are required, a flight crew member, following completion of a Type Rating or command course, and the associated line flying under supervision, is inexperienced until either:

a. He has achieved 50 flight hours on the type and/or in the role within a period of 60 days; or

b. He has achieved 100 flight hours on the type and/or in the role (no time limit).

2 A lesser number of flight hours, on the type and/or in the role, may be acceptable to the BCAA when:

a. A new operator is commencing operations; or

b. The operator introduces a new helicopter type; or

c. Flight crew members have previously completed a type conversion course with the same operator (re - conversion); and

d. Subject to any other conditions which the BCAA may impose.

IEM OPS 3.940(b)(1)
Composition of Flight Crew
See ANTR OPS 3.940(b)(1)

1 In some States the Airspace Authorities have determined that all flight at night should be conducted under IFR. These States then make provisions for helicopter flights at night to be conducted under conditions similar to night VFR in other States.

2 For States (where national legislation requires flight in accordance with IFR at night) who take advantage of this alleviation, the operator should comply with guidance published by the BCAA to ensure that the pilot is appropriately qualified.

AC No 1 to ANTR OPS 3.943
Crew Resource Management (CRM)
See ANTR OPS 3.943/3.945(a)(9)/3.955(b)(6)/3.965(e)/3.965(a)(3)(iv)
See AC No. 2 to ANTR OPS 3.943

1 General

1.1 Crew Resource Management (CRM) is the effective utilisation of all available resources (e.g. crew members, helicopter systems, supporting facilities and persons) to achieve safe and efficient operation.

1.2 The objective of CRM is to enhance the communication and management skills of the flight crew member concerned. The emphasis is placed on the non-technical aspects of flight crew performance.

2 Initial CRM Training

2.1 Initial CRM training programme is designed to provide knowledge of, and familiarity with, human factors relevant to flight operations.

2.2 A CRM trainer should:

a. have followed a theoretical HPL course covering the whole syllabus of the HPL examination; or

b. have successfully passed the Human Performance and Limitations (HPL) examination (see the requirements applicable to the issue of Flight Crew Licences); and

c. have and maintain adequate knowledge of the operation and helicopter type; and

d. be supervised by suitably qualified CRM training personnel when conducting their first initial CR M training session; and

e. have knowledge of group management, group dynamics and personal awareness.

2.3 The operator should ensure that initial CRM training addresses the nature of the operations of the company concerned, as well as the associated procedures and the culture of the company. This will include areas of operations which produce particular difficulties or involve adverse climatic conditions and any unusual hazards.

2.4 If the operator does not have sufficient means to establish initial CRM tra ining, use may be made of a course provided by another operator, or a third party or training organisation acceptable to the BCAA.In this event the operator should ensure that the content of the course meets his operational requirements. When crew members from several companies follow the same course, CRM core elements should be specific to the nature of operations of the companies and the trainees concerned.

2.5 A flight crew member's CRM skills should not be assessed during initial CRM training.

3 Conversion Course CRM training

3.1 If the flight crew member undergoes a conversion course with a change of helicopter type and/or achange of operator, elements of the Initial CRM course should be covered as required.

3.2 A flight crew member should not be assessed when completing elements of CRM training which are part of the operator's conversion course.

4 Command course CRM training

4.1 The operator should ensure that elements of the Initial CRM course are integrated into the command course and covered as required.

4.2 A flight crew member should not be assessed when completing elements of CRM training which are part of the command course, although feedback should be given.

5 Recurrent CRM training

5.1 A flight crew member should not be assessed when completing elements of CRM training which are part of recurrent training.

6. Implementation of CRM

6.1 The following table indicates which elements of CRM should be included in each type of training

Table 1

<table>
<tr><th>Core Elements
(a)</th><th>Initial CRM training
(b)</th><th>Operator's conversion course when changing type
(c)</th><th>Operators conversion course when changing operator
(d)</th><th>Command course
(e)</th><th>Recurrent training
(f)</th></tr>
<tr><td>Human error and reliability, error chain, error prevention and detection</td><td rowspan="7">In depth</td><td>In depth</td><td>Overview</td><td>Overview</td><td rowspan="7">Overview</td></tr>
<tr><td>Company safety culture, SOPs, organisational factors</td><td rowspan="2">Not required</td><td>In depth</td><td rowspan="6">In depth</td></tr>
<tr><td>Stress, stress management, fatigue and vigilance</td><td rowspan="3">Not required</td></tr>
<tr><td>Information acquisition and processing, situational awareness, workload management</td><td rowspan="4">Overview</td></tr>
<tr><td>Decision making</td></tr>
<tr><td>Communication and coordination inside and outside the cockpit</td><td rowspan="2">Overview</td></tr>
<tr><td>Leadership and team behaviour synergy</td></tr>
<tr><td>Automation, philosophy of the use of automation (if relevant to the type)</td><td></td><td rowspan="2">In depth</td><td>In depth</td><td rowspan="2">As required</td><td rowspan="2">As required</td></tr>
<tr><td>Specific type related differences</td><td>As required</td><td>Not required</td></tr>
<tr><td>Case based studies</td><td>In depth</td><td>In depth</td><td>In depth</td><td>In depth</td><td>As appropriate</td></tr>
</table>

7 Co-ordination between flight crew and crew members other than flight crew training

7.1 Operators should, as far as is practicable, provide combined training for flight crew and crew members other than flight crew including briefing and debriefing.

7.2 There should be an effective liaison between flight crew and other crew members training departments. Provision should be made for flight and other crew instructors to observe and comment on each other's training.

AC No. 2 to ANTR OPS 3.943
Crew Resource Management (CRM)
See ANTR OPS 3.943/3.945(a)(9)/3.955(b)/3.965(e)/3.965(a)(3)(iv)
See AC No. 1 to ANTR OPS 3.943

1 CRM training should reflect the culture of the operator and be conducted by means of both classroom training and practical exercises including group discussions and accident and serious incident reviews to analyze communication problems and instances or examples of a lack of information or crew management.

2 Whenever it is practicable to do so, consideration should be given to conducting relevant parts of CRM training in synthetic training devices which reproduce, in an acceptable way, a realistic operational environment and permit interaction. This includes, but is not limited to, simulators with appropriate LOFT scenarios.

3 It is recommended that, whenever possible, initial CRM training be conducted in a group session outside the company premises so that the opportunity is provided for flight crew members to interact and communicate away from the pressures of their usual working environment.

4 Assessment of CRM Skills

4.1 Assessment is the process of observing, recording, interpreting and evaluating, where appropriate, pilot performance and knowledge against a required standard in the context of overall performance. It includes the concept of self-critique, and feedback which can be given continuously during training or in summary following a check.

4.2 CRM skills assessment should be included in an overall assessment of the flight crew members performance and be in accordance with approved standards. Suitable methods of assessment should be established, together with the selection criteria and training requirements of the assessors and their relevant qualifications, knowledge and skills.

4.3 Individual assessments are not appropriate until the crew member has completed the initial CRM course and completed the first OPC. For first CRM skills assessment, the following methodology is considered satisfactory:

a. The operator should establish the CRM training programme including an agreed terminology. This should be evaluated with regard to methods, length of training, depth of subjects and effectiveness.

b. A training and standardisation programme for training personnel should then be established.

c. For a transition period, the evaluation system should be crew rather than individually based.

5. Levels of Training (For any CRM training, the following two levels are recognised):.

a. Overview. When Overview training is required it will normally be instructional in style. Such trainin g should refresh knowledge gained in earlier training.

b. In Depth. When In Depth Training is required it will normally be interactive in style and should include, as appropriate, case studies, group discussions, role play and consolidation of knowledge an d skills.Core elements should be tailored to the specific needs of the training phase being undertaken.

AC OPS 3.945(a)(9)
Crew Resource Management - Use of Automation
See ANTR OPS 3.945(a)(9)

1 The conversion course should include training in the use and knowledge of automation and in the recognition of systems and human limitations associated with the use of automation. The operator should therefore ensure that a flight crew member receives training on:

a. The application of the operations policy concerning the use of automation as stated in the Operations Manual; and

b. System and human limitations associated with the use of automation.

2 The objective of this training should be to provide appropriate knowledge, skills and behavioural patterns for managing and operating automated systems. Special attention should be given to how automation increases the need for crews to have a common understanding of the way in which the system performs, and any features of automation which make this understanding difficult.

AMC OPS 3.945
Conversion Course Syllabus
See ANTR OPS 3.945

1 General

1.1 The conversion course should be conducted in the following order:

a. Ground training covering all helicopter systems and emergency procedures (with or without flight simulator or other training device).

b. Emergency and safety equipment training and checking (completed before flying training on the helicopter commences).

c. Flying training (flight simulator and/or helicopter).

d. Line flying under supervision.

2 Ground training

2.1 Ground training should comprise a properly organised programme of ground instruction by training staff with adequate facilities, including any necessary audio, mechanical and visual aids. However, if the helicopter concerned is relatively simple, private study may be adequate if the operator provides suitable manuals and/or study notes.

2.2 The course of ground instruction should incorporate formal tests on such matters, where applicable, as helicopter systems, performance and flight planning, etc.

3 Flying training

3.1 Flying training should be structured and sufficiently comprehensive to familiarise the flight crew member thoroughly with all aspects of limitations and normal operation of the helicopter, including the use of all cockpit equipment, and with all abnormal/emergency procedures and should be carried out by suitably qualified Type Rating Instructors and/or Type Rating Examiners.

3.2 In planning flying training on helicopters with a flight crew of 2 or more, particular emphasis should be placed on the practice of Line Orientated Flying Training (LOFT) with emphasis on Crew Resource Management (CRM) and the use of correct crew coordinated procedures, including coping with incapacitations.

3.3 Generally the same training and practice in the flying of the helicopter should be given to co-pilots as well as commanders. The 'flight handling' sections of the syllabus for commanders and co -pilots alike should include all the requirements of the appropriate proficiency check required by ANTR OPS 3.965.

3.4 Training should include all elements of an instrument rating test where it is likely that the flight crew member will be required to operate under IFR.

3.5 Unless the training programme has been carried out in an appropriate flight simulator, and in a manner approved for zero flight time conversions, the training required should include an element of proficiency training on a helicopter, including at least 3 take-offs and landings.

3.6 Unless already covered by paragraph 3.3 above before they are assigned to line duty all flight crew should have successfully completed a proficiency check with a Type Rating Examiner.

4 Emergency and safety equipment training and checking. Emergency and safety equipment training should take place whenever practicable in conjunction with crew members doing similar training with emphasis on co-ordinated procedures and two-way communications.

4.1 For new crew members, or as applicable on conversion, the following should be addressed:

a. Instruction should be given on aeromedical topics which should include at least:

i. First aid subjects in general, and as appropriate to the helicopter type and crew complement;

ii. Guidance on the avoidance of food poisoning;

iii. The possible dangers associated with the contamination of the skin or eyes by aviation fuel and other fluids and the immediate treatment;

iv. The recognition and treatment of hypoxia and hyperventilation; and,

v. Survival training and guidance on hygiene appropriate to the routes operated.

b. Training should also include:

i. The importance of effective coordination between flight crew and crew members;

ii. The use of smoke protection equipment and protective clothing where carried. In the case of the first type of helicopter so equipped, training should be associated with experience of movement in a cosmetic smoke filled environment; and

iii. Actual fire fighting using equipment representative of that carried in the helicopter;

iv. The operational procedures of security, rescue and emergency services.

c. Operators should provide survival training appropriate to their areas of operation, (e.g. polar, desert, jungle or sea), including the use of any survival equipment carried.

d. A comprehensive drill to cover all ditching procedures should be practised where flotation equipment is carried. This should include practice of the actual donning and inflation of a life -jacket, together with a demonstration or film of the inflation of life-rafts and/or slide-rafts and associated equipment. This practice should, in initial training, be conducted using the equipment in water, although previous certificated training with another operator or the use of similar equipment will be accepted in lieu of further wet drill training.

e. Instruction on the location of emergency and safety equipment, correct use of all appropriate drills, and procedures that could be required of flight crew in different emergency situations. Evacuation of the helicopter (or a realistic training device) by use of a slide where fitted should be included when the Operations Manual procedure requires the early evacuation of flight crew to assist on the ground.

f. On completion of emergency and safety equipment training the flight crew member should undergo the check specified in ANTR OPS 3.965(c).

5 Line flying under supervision

5.1 Following completion of flying training and checking as part of the conversion course, all flight crew members should operate a minimum number of sectors and/or flying hours under the supervision of a nominated flight crew member. The minimum figures should be specified in the Operations Manual and should be selected after due note has been taken of the complexity of the helicopter and the experience of the flight crew member.

5.2 On completion of the sectors and/or flying hours under supervision, a line check should be completed.

6 Passenger handling. Other than general training on dealing with people, emphasis should be placed on the following:

a. Advice on the recognition and management of passengers who appear or become intoxicated with alcohol, under the influence of drugs or aggressive;

b. Methods used to motivate passengers and the crowd control necessary to expedite a helicopter evacuation;

c. Awareness of the types of dangerous goods which may, and may not, be carried in a passenger cabin, including the completion of a dangerous goods training programme; and

d. The importance of correct seat allocation with reference to helicopter mass and balance. Particular emphasis should also be given on the seating of disabled passengers and the necessity of seating able- bodied passengers adjacent to unsupervised exits.

7 Discipline and responsibilities. Amongst other subjects, emphasis should be placed on discipline and an individual's responsibilities in relation to:

a. His ongoing competence and fitness to operate as a crew member with special regard to flight time limitation requirements; and

b. Security procedures.

8. Passenger briefing/safety demonstrations. Training should be given in the preparation of passengers for normal and emergency situations.

IEM OPS 3.945
Line Flying under Supervision
See ANTR OPS 3.945

1 Line flying under supervision provides the opportunity for a flight crew member to carry into practice the procedures and techniques he has been made familiar with during ground and flying training on aconversion course. This is accomplished under the supervision of a flight crew member specifically nominated and trained for the task. At the end of line flying under supervision the respective student crew member is able to perform a safe and efficient flight conducted within the tasks of his crew member station.

2 A variety of reasonable combinations may exist with respect to:

a. A flight crew member's previous experience;

b. The complexity of the helicopter concerned; and

c. The type of route/role/area operations,

IEM OPS 3.945(a)(8)
Completion of the operator's Conversion Course
See ANTR OPS 3.945(a)(8)

1 A conversion course is deemed to have started when the flying or FSTD has begun. The theoretical element of a conversion course may be undertaken ahead of the practical element.

2 Under certain circumstances a conversion course may have started and reached a stage where, for unforeseen reasons, it is not possible to complete it without a delay. In these circumstances the operator may apply to the BCAA to allow the pilot to revert to the original type.

3 Before the resumption of the conversion course the operator should establish with the BCAA how much of the conversion course needs to be re-covered before continuing with the remainder of the course.

IEM to Appendix 1 to ANTR OPS 3.955(a)(1)(v)
Upgrading to commander - CRM training
See Appendix 1 to ANTR OPS 3.955(a)(1)(v)

1 The objective of this training is to enhance the communication and management skill s of the flight crew member concerned. The emphasis is placed on the non-technical aspects of flight crew performance.

2 This CRM training should contain the following elements:

a. The basic module

i. Situational awareness;

ii. Appropriate assertiveness/guidelines for effective speaking up;

iii. Effective communication within the crew;

iv. Enhancing crew co-operation;

v. Identifying and managing stress.

b. The specific module; aimed at management skills.

i. Information management including the effective utilisation of all available resources such as other crew members, aircraft systems, supporting facilities and information from outside.

ii. Leadership;

iii. Delegation;

iv. Judgement and decision making;

v. Effective communication skills as desired for commanders.

3 This training should include both:

a. Classroom training; and

b. Practical exercises including group discussions and accident reviews to analyse communication problems and instances or examples of a lack of information or crew management.

AMC OPS 3.965
Recurrent Training and Checking
See ANTR OPS 3.965

1 General. The line check is performed in the helicopter. All other training and checking should be performed in the helicopter or an appropriate Synthetic Training Device or, in the case of emergencyand safety equipment training, in a suitable alternative training device. The type of equipment used for training and checking should be representative of the instrumentation, equipment and layout of the helicopter type operated by the flight crew member.

2 Line Checks

2.1 The operator has a statutory obligation to check that his pilots are competent to perform their duties. The line check is considered a particularly important factor in the development, maintenance and refinement of high operating standards, and can provide the operator with a valuable indication of the usefulness of his training policy and methods. The requirement is for a test of ability to perform satisfactorily a complete line operation from start to finish, including pre-flight and post-flight procedures and use of the equipment provided and for an involvement of an overall assessment of the ability to perform the duties required as specified in the Operations Manual. The route chosen should be such asto give adequate representation of the scope of a pilot's normal operations. The line check is not intended to determine competence on any particular route.

2.2 The commander in particular should also demonstrate his ability to 'manage' the operation and take appropriate command decisions.

a. Since pilots may carry out either the handling or the non-handling duties, all pilots should be checked in both roles.

3 Proficiency Training and Checking. When a flight simulator is used, the opportunity should be taken, where possible, to use Line Oriented Flying Training (LOFT).

AC OPS 3.965(d)
Emergency and Safety Equipment Training
See ANTR OPS 3.965(d)

1 The successful resolution of helicopter emergencies requires interaction between crew members and emphasis should be placed on the importance of effective co-ordination and two-way communication between all crew members in various emergency situations.

2 Emergency and Safety Equipment training should include joint practice in helicopter evacuations so that all who are involved are aware of the duties other crew members should perform. When such practice is not possible, combined flight crew and other crew member training should include joint discussion of emergency scenarios.

3 Emergency and safety equipment training should, as far as is practicable, take place in conjunction with other crew members undergoing similar training with emphasis on co-ordinated procedures and two-way communication between the flight deck and the cabin.

IEM to Appendix 1 to ANTR OPS 3.965
Recurrent training and checking
See Appendix 1 to ANTR OPS 3.965

1 Use and approval of Synthetic Training Devices (FSTD) training. Training and checking provides an opportunity for the practice of abnormal/emergency procedures which rarely arise in normal oper ations and is a part of a structured programme of recurrent training. This should be carried out in a Synthetic Training Device whenever possible.

2 Where there is a Flight Manual limitation on the use of certain emergency power ratings, procedures to permit realistic engine-failure training and demonstration of competence, without actual use of the emergency power ratings, must be developed in conjunction with the aircraft manufacturer and included in the aircraft flight manual. These procedures must also be approved by the BCAA.

3 Where the emergency drills require action by the non-handling pilot, the check should additionally cover knowledge of these drills.

4 Because of the unacceptable risk when simulating emergencies such as rotor failure, icing problems, certain types of engine(s) (e.g. during continued take-off or go-around, total hydraulic failure etc.), or because of environmental considerations associated with some emergencies (e.g. fuel dumping) these emergencies should preferably be covered in a Synthetic Training Device. If no Synthetic Training Device is available these emergencies may be covered in the helicopter using a safe airborne simulation, bearing in mind the effect of any subsequent failure, and discussion on the ground.

5 The operator proficiency check may include the annual instrument rating test. In this case a combined check report may be used details of which shall be contained in the Operations Manual.

AMC to Appendix 1 to ANTR OPS 3.965 sub-paragraph (a)(3)(iii)(D)
Water survival training
See Appendix 1 to ANTR OPS 3.965 sub-paragraph (a)(3)(iii)(D)

1 Where life-rafts are fitted for extended overwater operations (such as Sea Pilot transfer; offshore operation; regular, or scheduled, coast to coast overwater operations; or other operations designated as such by the BCAA), a comprehensive wet drill to cover all ditching procedures should be practised by aircraft crews. This wet drill is to include, as appropriate, practice of the actual donning and inflation of a life-jacket, together with a demonstration or film of the inflation of life-rafts. Crews should board the same (or similar) life-rafts from the water whilst wearing a life-jacket. Training should include the use of all survival equipment carried on board life-rafts and any additional survival equipment carried separately on board the aircraft.

2 Consideration should be given to the provision of further specialist training such as underwater escape training.

Note: Wet practice drill is always to be given in initial training unless the crew member concerned has received similar training provided by another operator and such an arrangement is acceptable to the BCAA.

AMC OPS 3.975
Route/Role/Area Competence Qualification
See ANTR OPS 3.975

1 Route/role/area competence training should include knowledge of:

a. Terrain and minimum safe altitudes;

b. Seasonal meteorological conditions;

c. Meteorological, communication and air traffic facilities, services and procedures;

d. Search and rescue procedures;

e. Navigational facilities associated with the route along which the flight is to take place; and

f. Obstructions, physical layout, lighting, approach aids and arrival, departure, holding and instrument approach procedures and applicable operating minima.

g. Information related to RFFS (rescue and Fire Fighting Services) protection shall be described in the operators Operations Manual for aerodrome information against helicopter Fire Fighting required.

2 Depending on the complexity of the route and/or aerodrome, the following methods of familiarisation should be used:

a. For the less complex route/role/area and/or heliport or landing location, familiarisation by self-briefing with route documentation, or by means of programmed instruction, and

b. For the more complex routes and/or heliports or landing locations, in addition to sub-paragraph 2a above, in-flight familiarisation as a commander, co-pilot or observer under supervision, or familiarisation in an approved flight simulator using a data base appropriate to the route concerned.

3 Route competence may be revalidated by operating on the route within the previous period of validity instead of the procedure given in paragraph 2 above.

AMC OPS 3.980
Operation on more than one type or variant
See ANTR OPS 3.980

1 Operators of more than one helicopter variant or type should provide in the Operations Manual:

a. Flight crew members minimum experience level;

b. The process whereby flight crew qualified on one type or variant will be trained and qualified on another type or variant; and

c. Any additional recency requirements that may be required.

2 If a flight crew member operates more than one type or variant the following provisions should be satisfied:

a. The recency requirements specified in ANTR OPS 3.970 should be met and confirmed prior to commercial air transport operations on any type, and the minimum number of flights on each type within a three month period specified in the Operations Manual;

b. ANTR OPS 3.965 requirements with regard to recurrent training;

c. ANTR OPS 3.965 requirements with regard to proficiency checks may be satisfied by a 6 monthly check on any one type or variant operated. However, a proficiency check on each type or variant operated should be completed every 12 months;

d. For helicopters with a maximum certificated take-off mass (MCTOM) exceeding 5 700 kg, or with a maximum approved passenger seating configuration (MAPSC) of more than 19:

i. The flight crew member should not fly more than two helicopter types;

ii. A minimum of 3 months and 150 hours experience on the type or variant should be achieved before the flight crew member should commence the conversion course onto the new type or variant;

iii. 28 days and/or 50 hours flying should then be achieved exclusively on the new type or variant; and

iv. A flight crew member should not be rostered to fly more than one type or significantly different variant of a type during a single duty period.

e. In the case of all other helicopters, a flight crew member should not operate more than three helicopter types or significantly different variant.

f. For a combination of helicopter and aeroplane:

i. A flight crew member may fly one helicopter type or variant and one aeroplane type irrespective of their maximum certificated take-off mass (MCTOM) or the maximum approved passenger seating configuration (MAPSC) that may be carried.

ii. If the helicopter type is covered by paragraph 2.d. then paragraphs 2.d.ii., 2.d.iii. and 2.d.iv should also apply in this case.

IEM OPS 3.985
Training records
See ANTR OPS 3.985

A summary of training should be maintained by the operator to show a trainee's completion of each stage of training and checking.

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AC/AMC/IEM O – CREW MEMBERS OTHER THAN FLIGHT AND CABIN CREW

AC OPS 3.995(b)
Minimum requirements
See ANTR OPS 3.995(a)(2)

1 The initial medical examination or assessment and any re-assessment of crew members should be conducted by, or under the supervision of, a medical practitioner acceptable to the BCAA.

2 The operator should maintain a medical record for each crew member.

3 The following medical requirements are applicable for each crew member:

a. Good health;

b. Free from any physical or mental illness which might lead to incapacitation or inability to perform crew duties;

c. Normal cardio respiratory function;

d. Normal central nervous system;

e. Adequate visual acuity 6/9 with or without glasses;

f. Adequate hearing; and

g. Normal function of ear, nose and throat.

AC OPS 3.1005
Initial training
See ANTR OPS 3.1005

1 The operator should ensure that all elements of initial training are conducted by suitably qualified persons.

2 *Fire and Smoke Training*. The operator should ensure that fire and smoke training includes:

2.1 Emphasis on the responsibility of crew to deal promptly with emergencies involving fire and smoke and, in particular, emphasis on the importance of identifying the actual source of the fire;

2.2 The classification of fires and the appropriate type of extinguishing agents and procedures for particular fire situations, the techniques of application of extinguishing agents, the consequences of misapplication, and of use in a confined space; and

2.3 The general procedures of ground-based emergency services at heliports or landing locations.

3 *Water Survival Training*. The operator should ensure that, when extended overwater operations are to be conducted, water survival training includes the actual donning and use of personal flotation equipment in water by each crew member. Before first operating on a helicopter fitted with life-rafts orother similar equipment, training must be given on the use of this equipment, as well as actual practice in water.

4 *Survival Training*. The operator should ensure that survival training is appropriate to the areas of operation, (e.g. polar, desert, jungle, sea or mountain).

5 *Medical aspects and First Aid*. The operator should ensure that medical and first aid training includes:

5.1 Instruction on first aid and the use of first-aid kits; and

5.2 The physiological effects of flying and with particular emphasis on hypoxia (when applicable).

6 *Passenger handling*. The operator should ensure that training for passenger handling includes the following:

6.1 Regulations covering the safe stowage of cabin baggage and the risk of it becoming a hazard to occupants of the cabin or otherwise obstructing or damaging emergency equipment or helicopter exits;

6.2 Duties to be undertaken in the event of encountering turbulence including securing the cabin;

6.3 Precautions to be taken when live animals are carried in the cabin;

6.4 Dangerous Goods training as prescribed in Subpart R; and

6.5 Security procedures, including the provisions of Subpart S.

7 *Communication*. The operator should ensure that, during training, emphasis is placed on the importance of effective communication between crew members and flight crew including technique, common

language and terminology.

8 *Discipline and responsibilities*. The operator should ensure that each crew member receives training on:

8.1 The importance of crew members performing their duties in accordance with the Operations Manual;

8.2 Continuing competence and fitness to operate as a crew member with special regard to flight and duty time limitations and rest requirements;

8.3 An awareness of the aviation regulations relating to crew members and the role of the BCAA;

8.4 General knowledge of relevant aviation terminology, theory of flight, passenger distribution, meteorology and areas of operation;

8.5 Pre-flight briefing of the crew members and the provision of necessary safety information with regard to their specific duties;

8.6 The importance of ensuring that relevant documents and manuals are kept up-to-date with amendments provided by the operator;

8.7 The importance of identifying when crew members have the authority and responsibility to initiate an evacuation and other emergency procedures; and

8.8 The importance of safety duties and responsibilities and the need to respond prom ptly and effectively to emergency situations.

9 *Crew Resource Management*. The operator should ensure that appropriate ANTR OPS 3 requirements are included in the training of crew members.

AC OPS 3.1010
Conversion and Differences training
See ANTR OPS 3.1010

1 *General.* The operator should ensure that:

1.1 Conversion and differences training is conducted by suitably qualified persons; and

1.2 During conversion and differences training, training is given on the location, removal and use of all safety and survival (and additional) equipment carried on the helicopter, as well as all normal and emergency procedures related to the helicopter type, variant and configuration to be operated.

2 *Fire and smoke training*. The operator should ensure that either:

2.1 Each crew member is given realistic and practical training in the use of all fire fighting equipment including protective clothing representative of that carried in the helicopter. This training should include:

a. Each crew member extinguishing a fire characteristic of a helicopter interior fire except that, in the caseof Halon extinguishers, an alternative extinguishing agent may be used; and

b. The donning and use of protective breathing equipment (when fitted) by each crew member in an enclosed, simulated smoke-filled environment; or

2.2 Each crew member fulfils the recurrent training requirements of AC OPS 3.1015 subparagraph 3.3.

3 *Operation of doors and exits*. The operator should ensure that:

3.1 Each crew member operates and actually opens all normal and emergency exits for passenger evacuation in a helicopter or representative training device; and

3.2 The operation of all other exits is demonstrated.

4 Evacuation procedures and other emergency situations. The operator should ensure that:

4.1 Emergency evacuation training includes the recognition of planned or unplanned evacuations on landor water. This training must include recognition of when exits are unusable or when evacuation equipment is unserviceable; and

4.2 Each crew member is trained to deal with the following:

a. An in-flight fire, with particular emphasis on identifying the actual source of the fire; and

b. Other in-flight emergencies.

5 *Pilot incapacitation*. The operator should ensure that, where the flight crew is more than one, the crew member is trained to assist if a pilot becomes incapacitated. This training should include a demonstration of:

5.1 The pilot's seat mechanism;

5.2 Fastening and unfastening the pilot's seat harness;

5.3 Use of the pilot's oxygen equipment, when applicable; and

5.4 Use of pilots' checklists.

6 *Safety equipment*. The operator should ensure that each crew member is given realistic training on, and demonstration of, the location and use of safety equipment including the following:

6.1 Life-rafts, including the equipment attached to, and/or carried in, the raft, where applicable;

6.2 Lifejackets, infant lifejackets and flotation cots, where applicable;

6.3 Fire extinguishers;

6.4 Fire axe or crow-bar;

6.5 Emergency lights including torches;

6.6 Communications equipment, including megaphones;

6.7 Survival packs, including their contents;

6.8 Pyrotechnics (actual or representative devices);

6.9 First-aid kits, their contents and emergency medical equipment; and

6.10 Other safety equipment or systems where applicable.

7 *Passenger Briefing/Safety Demonstrations.* The operator should ensure that training is given in the preparation of passengers for normal and emergency situations in accordance with ANTR OPS 3.285.

8 The operator should ensure that all appropriate ANTR OPS 3 requirements are included in the training of crew members.

AC OPS 3.1015
Recurrent training
See ANTR OPS 3.1015

1 The operator should ensure that recurrent training is conducted by suitably qualified persons.

2 The operator should ensure that every year the programme of practical training includes the following:

2.1 Emergency procedures including pilot incapacitation, when applicable;

2.2 Evacuation procedures;

2.3 Touch-drills by each crew member for opening normal and emergency exits for passenger evacuation;

2.4 The location and handling of emergency equipment, and the donning by each crew member of lifejackets, and protective breathing equipment (PBE), when applicable;

2.5 First aid and the contents of the first-aid kit(s);

2.6 Stowage of articles in the cabin;

2.7 Dangerous goods procedures as prescribed in Subpart R;

2.8 Security procedures;

2.9 Incident and accident review; and

2.10 Crew Resource Management.

3 The operator should ensure that, every 3 years, recurrent training also includes:

3.1 The operation and actual opening of all normal and emergency exits for passenger evacuation in a helicopter or representative training device;

3.2 Demonstration of the operation of all other exits;

3.3 Each crew member being given realistic and practical training in the use of all fire-fighting equipment, including protective clothing, representative of that carried in the helicopter. This training should include:

a. Each crew member extinguishing a fire characteristic of a helicopter interior fire except that, in the case of Halon extinguishers, an alternative extinguishing agent may be used; and

b. The donning and use of protective breathing equipment (when fitted) by each crew member in an enclosed, simulated smoke-filled environment.

3.4 Use of pyrotechnics (Actual or representative devices); and

3.5 Demonstration of the use of the life-raft, where fitted.

4 The operator should ensure that all appropriate ANTR OPS 3 requirements are included in the training of crew members.

AC OPS 3.1020
Refresher training
See ANTR OPS 3.1020

1 The operator should ensure that refresher training is conducted by suitably qualified persons and, for each crew member, includes at least the following:

1.1 Emergency procedures including pilot incapacitation, when applicable;

1.2 Evacuation procedures;

1.3 The operation and actual opening of all normal and emergency exits for passenger evacuation in a helicopter or representative training device;

1.4 Demonstration of the operation of all other exits; and

1.5 The location and handling of emergency equipment, and the donning of lifejackets, and protective breathing equipment, when applicable.

AC OPS 3.1025
Checking
See ANTR OPS 3.1025

1 Elements of training which require individual practical participation should be combined with practical checks.

2 The checks required by ANTR OPS 3.1025 should be accomplished by the method appropriate to the type of training including:

a. Practical demonstration; and/or

b. Computer based assessment; and/or

c. In-flight checks; and/or

d. Oral or written tests.

AC/AMC/IEM P – MANUALS, LOGS & RECORDS

IEM OPS 3.1040(b)
Elements of the Operations Manual subject to approval
See ANTR OPS 3.1040(b)

1 A number of the provisions of OPS require the prior approval of the BCAA. As a consequence, the related sections of the Operations Manual should be subject to special attention. In practice, there are two possible options:

a. The BCAA approves a specific item (e.g. with a written response to an application) which is then included in the Operations Manual. In such cases, the BCAA merely checks that the Operations Manual accurately reflects the content of the approval. In other words, such text has to be acceptable to theBCAA; or

b. The operator's application for an approval includes the related, proposed, Operations Manual text in which case, the BCAA's written approval encompasses approval of the text.

2 In either case, it is not intended that a single item should be subject to two separate approvals.

3 The following list indicates only those elements of the Operations Manual which require specific approval by the BCAA.

Ops Manual Section
(App. 1 to ANTR- ANTR OPS 3.1045)

Subject			OPS Reference
A 2.4	Operational Control		3.195
A 5.2(f)	Procedures for flight crew to operate on more than one type or variant		3.980
A 5.3(c)	Procedures for cabin crew to operate on four helicopter types		3.1030(a)
A 8.1.1	Method of determination of minimum flight attitudes		3.250(b)
A 8.1.8	(i)	Standard mass values other than those specified in Subpart J Mass and balance:	3.620(i
	(ii)	Alternative documentation and related procedures	3.625(c
	(iii)	Omission of data from documentation	App. 1 to ANTR OPS 3.625,§(a)(1)(ii)
	(iv)	Special standard masses for the traffic load	App. 1 to ANTR OPS 3.605, § (b)
A 8.1.11	Tech Log		~~3.915(b)~~ 3.1071
A 8.3.2(c)	RNAV (PBN)		3.243
A 8.4	All Weather Operations		3.440(a)(3), (b) & App.1 to ANTR OPS 3.455, Note 2
A 8.6	Use of MEL		3.030(a)
A 9	Dangerous Goods		3.1155
B 1.1(b)	Max. approved passenger seating configuration		3.480(a)(15)
B 6(b)	Use of on-board mass and balance systems		App. 1 to ANTR OPS 3.625, § (c)
B 9	MEL		3.030(a)
D 2.1	Cat II Training syllabus flight crew		3.450(a)(2)
	Recurrent training programme flight crew		3.965(a)(2)
D 2.2	Recurrent training programme cabin crew		3.1015(b)
D 2.3(a)	Dangerous Goods		3.1220(a)

IEM OPS 3.1040(c
Operations Manual - Language
See ANTR OPS 3.1040(c)

1 ANTR OPS 3.1040(c) requires the Operations Manual to be prepared in the English language. However, it is recognised that there may be circumstances where approval for the use of another language, for

part or all of the Operations Manual, is justifiable. The criteria on which such an approval may be based should include at least the following:

a. The language(s) commonly used by the operator;

b. The language of related documentation used, such as the HFM;

c. Size of the operation;

d. Scope of the operation i.e. domestic or international route structure;

e. Type of operation e.g. VFR/IFR; and

f. The period of time requested for the use of another language.

AMC OPS 3.1045
Operations Manual Contents
See ANTR OPS 3.1045

1 Appendix 1 to ANTR OPS 3.1045 prescribes in detail the operational policies, instructions, procedures and other information to be contained in the Operations Manual in order that operations personnel can satisfactorily perform their duties. When compiling an Operations Manual, the operator may take advantage of the contents of other relevant documents. Material produced by the operator for Part B of the Operations Manual may be supplemented with or substituted by applicable parts of the Helicopter Flight Manual required by ANTR OPS 3.1050 or, where such a document exists, by a Helicopter Operating Manual produced by the manufacturer of the helicopter. For Part C of the Operations Manual, material produced by the operator may be supplemented with or substituted by applicable Route G uide material produced by a specialised professional company .

2 If the operator chooses to use material from another source in his Operations Manual he should either copy the applicable material and include it directly in the relevant part of the Operatio ns Manual, or the Operations Manual should contain a statement to the effect that a specific manual(s) (or parts thereof) may be used instead of the specified part(s) of the Operations Manual.

3 If the operator chooses to make use of material from an alternative source (e.g. Jeppesen) as explained above, this does not absolve the operator from the responsibility of verifying the applicability and suitability of this material. (See ANTR OPS 3.1040(k).)

IEM OPS 3.1045(c)
Operations Manual Structure
See ANTR OPS 3.1045(c) & Appendix 1 to ANTR OPS 3.1045

1 ANTR OPS 3.1045(a) prescribes the main structure of the Operations Manual as follows:

Part A - General/Basic;

Part B - Helicopter Operating Matters - Type Related;

Part C - Route and Aerodrome Instructions and Information;

Part D - Training.

2 ANTR OPS 3.1045 (c) requires the operator to ensure that the detailed structure of the Operations Manual is acceptable to the BCAA.

3 Appendix 1 to ANTR OPS 3.1045 contains a comprehensively detailed and structured list of all items to be covered in the Operations Manual. Since it is believed that a high degree of standardisation of Operations Manuals will lead to improved overall flight safety, it is strongly recommended that the structure described in this IEM should be used by operators as far as possible. A List of Contents based upon Appendix 1 to ANTR OPS 3.1045 is given below.

4 Manuals which do not comply with the recommended structure may require a longer time to be accepted/approved by the BCAA.

5 To facilitate comparability and usability of Operations Manuals by new personnel, formerly employed by another operator, operators are recommended not to deviate from the numbering system used in Appendix 1 to ANTR OPS 3.1045. If there are sections which, because of the nature of the operation,

do not apply, it is recommended that operators maintain the numbering system described below and insert 'Not applicable' or 'Intentionally blank' where appropriate.

Operations Manual Structure

(List of Contents)

Part A GENERAL/BASIC

0 ADMINISTRATION AND CONTROL OF OPERATIONS MANUAL

0.1. Introduction
0.2 System of amendment and revision

1 ORGANISATION AND RESPONSIBILITIES

1.1 Organisational structure
1.2 Names of nominated postholders
1.3 Responsibilities and duties of operations management personnel
1.4 Authority, duties and responsibilities of the commander
1.5. Duties and responsibilities of crew members other than the commander

2 OPERATIONAL CONTROL AND SUPERVISION

2.1 Supervision of the operation by the operator
2.2 System of promulgation of additional operational instructions and information
2.3 Safety management system
2.4 Operational control
2.5 Powers of the BCAA

3 QUALITY SYSTEM

4 CREW COMPOSITION

4.1 Crew Composition
4.2 Intentionally blank
4.3 Flight crew incapacitation
4.4 Operation on more than one type

5 QUALIFICATION REQUIREMENTS

5.1 Description of licence, qualification/competency, training, checking etc.
5.2 Flight crew
5.3 Cabin crew
5.4 Training, checking and supervisory personnel
5.5 Other operations personnel

6 CREW HEALTH PRECAUTIONS

6.1 Crew health precautions

7 FLIGHT TIME LIMITATIONS

7.1 Flight and Duty Time limitations and Rest requirements
7.2 Exceedances of flight and duty time limitations and/or reduction of rest periods

8 OPERATING PROCEDURES

8.1 Flight Preparation Instructions

8.1.1 Minimum Flight Altitudes
8.1.2 Criteria for determining the usability of aerodromes
8.1.3 Methods for the determination of Heliport or Landing Location Operating Minima
8.1.4 En-route Operating Minima for VFR flights or VFR portions of a flight
8.1.5 Presentation and Application of Heliport or Landing Location and En-route Operating Minima
8.1.6 Interpretation of meteorological information
8.1.7 Determination of the quantities of fuel, oil and water methanol carried
8.1.8 Mass and Centre of Gravity

8.1.9 ATS Flight Plan
8.1.10 Operational Flight Plan
8.1.11 Operator's Helicopter Technical Log
8.1.12 List of documents, forms and additional information to be carried

8.2 Ground Handling Instructions

8.2.1 Fuelling procedures
8.2.2 Helicopter, passengers and cargo handling procedures related to safety
8.2.3 Procedures for the refusal of embarkation
8.2.4 De-icing and Anti-icing on the Ground

8.3 Flight Procedures

8.3.1 VFR/IFR policy
8.3.2 Navigation Procedures
8.3.3 Altimeter setting procedures
8.3.4 Audio voice alerting device
8.3.5 *Intentionally blank*
8.3.6 *Intentionally blank*
8.3.7 Policy and procedures for in-flight fuel management
8.3.8 Adverse and potentially hazardous atmospheric conditions
8.3.9 Wake Turbulence and Rotor Downwash
8.3.10 Crew members at their stations
8.3.11 Use of safety belts for crew and passengers
8.3.12 Admission to Cockpit
8.3.13 Use of vacant crew seats
8.3.14 Incapacitation of crew members
8.3.15 Cabin Safety Requirements
8.3.16 Passenger briefing procedures
8.3.17 *Intentionally blank*

8.4 All Weather Operations

8.5 *Intentionally blank*

8.6 Use of the Minimum Equipment and Configuration Deviation List(s)

8.7 Non revenue flights

8.8 Oxygen Requirements

9 DANGEROUS GOODS AND WEAPONS

10 SECURITY

11 HANDLING OF ACCIDENTS AND OCCURRENCES

12 RULES OF THE AIR

Part B HELICOPTER OPERATING MATTERS TYPE RELATED

0 GENERAL INFORMATION AND UNITS OF MEASUREMENT

1 LIMITATIONS

2 EMERGENCY PROCEDURES

3 NORMAL PROCEDURES

4 PERFORMANCE

4.1 Performance data
4.2 Additional performance data

5 MASS AND BALANCE

6 LOADING

7 FLIGHT PLANNING

8 CONFIGURATION DEVIATION LIST

9 MINIMUM EQUIPMENT LIST

10 SURVIVAL AND EMERGENCY EQUIPMENT INCLUDING OXYGEN

11 EMERGENCY EVACUATION PROCEDURES

11.1 Instructions for preparation for emergency evacuation
11.2 Emergency evacuation procedures

12 HELICOPTER SYSTEMS

Part C ROUTE AND AERODROME INSTRUCTIONS AND INFORMATION

Part D TRAINING

1 TRAINING SYLLABI AND CHECKING PROGRAMMES - GENERAL

2 TRAINING SYLLABI AND CHECKING PROGRAMMES

2.1 Flight Crew
2.2 Cabin Crew
2.3 Operations Personnel including Crew Members
2.4 Operations Personnel other than Crew Members

3 PROCEDURES

3.1 Procedures for training and checking

3.2 Procedures to be applied in the event that personnel do not achieve or maintain required standards

3.3 Procedures to ensure that abnormal or emergency situations are not simulated during commercial air transportation flights

4 DOCUMENTATION AND STORAGE

IEM to Appendix 1 to ANTR OPS 3.1045
Operations Manual Contents

With reference to Operations Manual Section B, paragraph 9 (Minimum Equipment List) and 12 (Helicopter Systems) operators should give consideration to using the ATA number system when allocating chapters and numbers for helicopter systems.

IEM OPS 3.1055(a)(12)
Signature or equivalent
See ANTR OPS 3.1055(a)(12)

1 ANTR OPS 3.1055 requires a signature or its equivalent. This IEM gives an example of how this can be arranged where normal signature by hand is impracticable and it is desirable to arrange the equivalent verification by electronic means.

2 The following conditions should be applied in order to make an electronic signature the equivalent of a conventional hand-written signature:

i. Electronic 'signing' should be achieved by entering a Personal Identification Number (PIN) code with appropriate security etc.;

ii. Entering the PIN code should generate a print-out of the individual's name and professional capacity on the relevant document(s) in such a way that it is evident, to anyone having a need for that information, who has signed the document;

iii. The computer system should log information to indicate when and where each PIN code has been entered;

iv. The use of the PIN code is, from a legal and responsibility point of view, considered to be fully equivalent to signature by hand;

v. The requirements for record keeping remain unchanged; and.

vi. All personnel concerned should be made aware of the conditions associated with electronic signature and should confirm this in writing.

IEM OPS 3.1055(b)
Journey log
See ANTR OPS 3.1055(b)

The 'other documentation' referred to in this paragraph might include such items as the operational flight plan, the helicopter technical log, cockpit flight report, crew lists etc.

AC/AMC/IEM Q – FATIGUE MANAGEMENT REQUIREMENTS

IEM to ANTR OPS 3.1101
General Rostering Principles based on Fatigue Science

The following are general rostering principles based on fatigue science.

The perfect schedule for the human body is daytime duties with unrestricted sleep at night. Anything else is acompromise.

(a) The circadian body clock does not adapt fully to altered schedules such as night work. It does adapt progressively to a new time zone, but full adaptation usually takes longer than the 24-48 hours of most layovers.

(b) Whenever a duty period overlaps a crew member's usual sleep time, it can be expected to restrict sleep. Examples include early duty start times, late duty end times, and night work.

(c) The more that a duty period overlaps a crew member's usual sleep time, the less sleep the crew member is likely to obtain. Working right through the usual night time sleep period is the worst case scenario.

(d) Night duty also requires working through the time in the circadian body clock cycle when self-rated fatigue and mood are worst and additional effort is required to maintain alertness and performance.

(e) The longer a crew member is awake, the worse their alertness and performance become.

(f) Across consecutive duties with restricted sleep, crew members will accumulate a sleep debt and fatigue-related impairment will increase.

(g) To recover from sleep debt, crew members need a minimum of two full nights of sleep in a row, when they are fully adapted to the local time zone. The frequency of recovery breaks should be related to the rate of accumulation of sleep debt.

(h) Keep short notice changes to a minimum, especially where they infringe or overlap the Window of CircadianLow (WOCL).

These scientific principles can be used by rostering personnel, trained in fatigue hazard identification, to develop evidence-based scheduling rules [see ANTR OPS 1.1103 (a) (3)]. Rosters need to be published sufficiently in advance to allow crew members to plan for work and rest periods.

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AC/AMC/IEM R – TRANSPORT OF DANGEROUS GOODS BY AIR

IEM OPS 3.1152 (a)(5) & (a)(6)
Terminology - Dangerous Goods Accident and Dangerous Goods Incident
See ANTR OPS 3.1152(a)(5) & (a)(6)

As a dangerous goods accident (see ANTR OPS 3.1152(a)(5)) and dangerous goods incident (see ANTR OPS 3.1152(a)(6)) may also constitute an aircraft accident or incident the criteria for reporting both types of occurrence should be satisfied.

IEM OPS 3.1155
Approval to transport dangerous goods
See ANTR OPS 3.1155

1 Permanent approval for the transport of dangerous goods will be reflected on the Air Operator Certificate. In other circumstances an approval may be issued separately.

2 Before the issue of an approval for the transport of dangerous goods, the operator should satisfy the BCAA that adequate training has been given, that all relevant documents (e.g. for ground handling, helicopter handling, training) contain information and instructions on dangerous goods, and that there are procedures in place to ensure the safe handling of dangerous goods at all stages of air transport.

3 The exemption or approval indicated in ANTR OPS 3.1165(b)(1) or (2) is in addition to that indicated by ANTR OPS 3.1155.

IEM OPS 3.1160(a)
Scope
See ANTR OPS 3.1160(a)

1 The Technical Instructions contain all the information which is relevant to the transport of dangerous goods by air, irrespective of what type of aircraft is used and in what circumstances.

2 Unless the wording in the Technical Instructions makes it otherwise apparent, all the provisions of the Technical Instructions apply on every occasion when dangerous goods are carried by helicopter. Dangerous goods may be carried other than in accordance with the Technical Instructions only when:

a They have been exempted under ANTR OPS 3.1165(b)(1); or

b. An approval has been issued under ANTR OPS 3.1175 or 3.1210; or

c. The BCAA has specified different markings under ANTR OPS 3.1180(b).

AMC OPS 3.1175
Packing
See ANTR OPS 3.1175

Refer to the packing requirements stipulated at the relevant chapters of Part-4 to the Technical Instruction for safe transport of dangerous goods by air (ICAO Doc 9284).

AMC OPS 3.1180(b)
Marking
See ANTR OPS 3.1180(b)

Refer to the packaging & marking requirements stipulated in the relevant chapters of Part-6 to the Technical Instruction for safe transport of dangerous goods by air (ICAO Doc 9284).

AMC OPS 3.1210(a)
Loading Restrictions
See ANTR OPS 3.1210(a)

Refer to loading restriction requirements stipulated at the relevant chapters of Part-7 to the Technical Instruction for safe transport of dangerous goods by air (Do

AMC OPS 3.1215(b)
Provision of information
See ANTR OPS 3.1215(b)

Refer to the provision of information stipulated at the relevant chapters of Part-7 & Part-8 to the Technical Instruction for safe transport of dangerous goods by air (ICAO Doc 9284).

AMC OPS 3.1215(e)
Information in the Event of a helicopter Incident or Accident
See ANTR OPS 3.1215(e)

Refer to the reporting requirement stipulated at the relevant chapters of Part-7 to the Technical Instruction for safe transport of dangerous goods by air (ICAO Doc 9284).

AMC OPS 3.1220
Training
See ANTR OPS 3.1220

Refer to the training requirement stipulated at chapter 4 of Part-1 to the Technical Instruction for safe transport of dangerous goods by air (ICAO Doc 9284).

IEM OPS 3.1220
Training
See ANTR OPS 3.1220

Refer to the training requirement stipulated at chapter 4 of Part-1 to the Technical Instruction for safe transport of dangerous goods by air (ICAO Doc 9284).

AMC OPS 3.1225
Dangerous Goods Incident and Accident Reports
See ANTR OPS 3.1225

Refer to the form ASSD-OF-03-DGR for reporting of DG incidents and accidents.

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AC S – SECURITY

AC OPS 3.1240
Training programmes
See ANTR OPS 3.1240

Individual crew member knowledge and competence should be based on the relevant elements described in ICAO doc 9811, “Manual of the implementation of the Security provisions of Annex 6” and ECAC DOC 30 part “Training for Cockpit and Cabin crew”.

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