Helicopter Operations Requirements

The Civil Aviation Authority of Thailand

Issue 03 Revision 00, Issued Date TBA

RECORD OF REVISIONS

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Issue 03 Revision 00

Issue No. Revision No.	Date	Subject	Inserted by
Issue 01 Revision 00	1 June 2018	-	CAAT (OPS)
Issue 01 Revision 01	16 May 2019	1) Added Chapter 2 paragraph 2.3.7 Refuelling with passengers on board or rotors turning. 2) Repealed Chapter 2 paragraph 2.9 Operation Over Bangkok. 3) Added Chapter 2 paragraph 2.10 Fatigue Management. 4) Added Chapter 4 paragraph 4.3 Flight Recorders. 5) Minor change in Chapter 10 Paragraph 10.1 6) Added new Appendix A: Flight Data Recorders and Aircraft Data Recording Systems. 7) 7) Added word “operator of Thai registered helicopter” instead of “operator”	CAAT (OPS)
Issue 02 Revision 00	14 NOV 2019	1) Added page number into table of contents 2) Changed Chapter 2 between paragraph 2.5 DUTIES OF FLIGHT OPERATIONS OFFICERS / FLIGHT DISPATCHER and paragraph 2.6 DUTIES OF PILOT-IN-COMMAND 3) Moved Chapter 2 paragraph 2.8 PSYCHOACTIVE SUBSTANCE to be paragraph 2.9 4) Deleted Chapter 2 paragraph 2.9 *(Reserved)* 5) Moved Chapter 2 paragraph 2.10 FATIGUE MANAGEMENT to be paragraph 2.8 6) Changed numbering Chapter 4 paragraph 4.3.3 to be paragraph 4.3.1 Flight data recorder and aircraft data recording system (FDRs) 7) Changed numbering Chapter 4 paragraph 4.3.4 to be paragraph 4.3.2 Cockpit voice recorders (CVRs) and cockpit audio recording systems 8) Changed numbering Chapter 4 paragraph 4.3.5 to be paragraph 4.3.3 Flight recorder - Data Link Recorder 9) Added Chapter 4 paragraph 4.3.1.1 note 2 10) Changed Chapter 4 between paragraph 4.3.2.3 and paragraph 4.3.2.4. 11) Added Chapter 12 Helicopter Emergency Medical Service Operations 12) Added Appendix D Guidelines for Helicopter emergency medical service	CAAT (OPS)

Issue No. Revision No.	Date	Subject	Inserted by
Issue 02 Revision 00	14 NOV 2019	13) Amended Chapter 4 paragraph 4.3.1(Note 2), paragraph 4.3.2 paragraph 4.3.3 paragraph 4.7.3 paragraph 4.14 and paragraph 4.18 14) Added Chapter 4 paragraph 4.3(c) in to Chapter 4 paragraph 4.3.1and paragraph 4.7.3. 15) Amended Chapter 5 paragraph 5.16 (a) 16) Amended Chapter 6 paragraph 6.1 paragraph 6.1.3 paragraph 6.1.4 paragraph 6.5.1 paragraph 6.5.2 paragraph 6.7.1 and paragraph 6.7.1 17) Added Chapter 6 paragraph 6.1.3 (a),(b) paragraph 6.1.6 paragraph 6.2.4 paragraph 6.5.1 paragraph 6.5.2 paragraph 6.5.3 paragraph 6.5.4 and paragraph 6.6 and paragraph 6. 18) Amended Chapter 9 paragraph 9.7. 19) Added Appendix A paragraph 1.1 20) Amended Appendix A paragraph 1.2 paragraph 1.3 and paragraph 1.4	CAAT (AIR)
Issue 02 Revision 01	21 FEB 2020	1) Amended Chapter 1 paragraph 1.1.6 2) Amended Chapter 6 paragraph 6.5.1 and paragraph 6.5.3	CAAT (OPS)
Issue 03 Revision 00	TBA	1) Amend definition: Continuous Descent Final Approach (CDFA), Maintenance, Maintenance release, Operations specification and repair. 2) Add definition: Low-visibility operation (LVO) and Special approval. 3) Add chapter 1: paragraph 1.3.3 and paragraph 1.3.4 4) Amend chapter 1: paragraph 1.3.2. 5) Renumbering chapter 1: paragraph 1.3.3 to paragraph 1.3.5 and paragraph 1.3.4 to paragraph 1.3.6. 6) Amend chapter 2 : paragraph 2.2.8.1, paragraph 2.2.8.2, paragraph 2.2.8.3, paragraph 2.2.8.4, paragraph 2.2.8.4 (b) 3), paragraph 2.2.8.5, paragraph 2.2.8.8, paragraph 2.3.5.3, paragraph 2.3.4.3, paragraph 2.3.5.5, paragraph 2.3.7.4, paragraph 2.4.1.2, paragraph 2.4.4.4, paragraph 2.4.7.2, paragraph 2.4.9.3, paragraph 2.4.9.4 and paragraph 2.5.3 7) Add chapter 2 : paragraph 2.2.8.3 (i), paragraph 2.2.8.3 (j) and paragraph 2.2.8.6 8) Re-numbering : paragraph 2.2.8.6 to paragraph 2.2.8.7, paragraph 2.2.8.7 to paragraph 2.2.8.8, paragraph 2.2.8.8 to paragraph 2.2.8.9, paragraph 2.2.8.9 to paragraph 2.2.8.10, paragraph 2.3.7.4 to paragraph 2.3.7.5 and paragraph 2.3.7.5 to paragraph 2.3.7.6 9) Delete chapter 2 : 4) and 5) in paragraph 2.2.8.4 (b) 10) Move chapter 2: paragraph 2.3.6.3 (d) to 2.3.6.4, paragraph 2.3.6.3 (e) to 2.3.6.5 and paragraph 2.6.2 to paragraph 2.6.1 (c) 11) Amend chapter 3:paragraph 3.1.2, paragraph 3.2.2	CAAT (OPS/AIR)

		12) Delete chapter 3: paragraph 3.1.4, paragraph 3.2.7.1 13) Add chapter 3: paragraph 3.1.3, paragraph 3.1.5 14) Move chapter 3 : chapter 3: paragraph 3.1.3 to 3.1.4 15) Re-numbering : paragraph 3.2.7.2 to paragraph 3.2.7.1, paragraph 3.2.7.3 to paragraph 3.2.7.2 and paragraph 3.2.7.4 to paragraph 3.2.7.3 16) Add chapter 4: paragraph 4.2.2 (c) 4), paragraph 4.3.1.3, paragraph 4.3.4, paragraph 4.3.4.1, paragraph 4.3.4.2, paragraph 4.3.4.3, paragraph 4.3.4.4 and paragraph 4.4.2.1 17) Amend chapter 4: paragraph 4.2.2.1, paragraph 4.2.3, paragraph 4.3.2.1, paragraph 4.3.3.2 (a), paragraph 4.3.3.2 (b), paragraph 4.4.3 (m), paragraph 4.7.3, paragraph 4.12.1, paragraph 4.13, paragraph 4.16.1, paragraph 4.17, paragraph 4.17.2 (a), paragraph 4.17.2 (b), paragraph 4.17.3 and paragraph 4.17.3 (a) 18) Delete chapter 4: paragraph ***Type of flight recorders*** and paragraph ***Flight Recorder for Helicopters*** 19) Move chapter 4 : paragraph 4.8 to paragraph 4.7.4 and paragraph 4.18 to paragraph 4.18 (below ELECTRONIC FLIGHT BAGS (EFBs)) 20) Renumbering: paragraph 4.9 to paragraph 4.8, paragraph 4.10 to paragraph 4.9, paragraph 4.11 to paragraph 4.10, paragraph 4.12 to paragraph 4.11, paragraph 4.13 to paragraph 4.12, paragraph 4.14 to paragraph 4.13, paragraph 4.15 to paragraph 4.14, paragraph 4.16 to paragraph 4.15 and paragraph 4.17 to paragraph 4.16 21) amend Chapter 5 : paragraph 5.1.1, paragraph 5.2.2, paragraph 5.2.3 and paragraph 5.2.4 22) amend chapter 6 : paragraph 6.5.2, paragraph 6.5.4 and paragraph 6.7.2 23) amend chapter 7 : paragraph 7.4.2.2 (b), 24) amend chapter 9: Major changes paragraph 9.2 25) add appendix A : note 1, note 2, note 3, not 4 (below APPENDIX A:Flight Data Recorders and Aircraft Data Recording Systems), Table A-5 Data link communications (DLC) recording installation clarification and (g) in paragraph 3 (b) 26) amend appendix A : paragraph 1.1 4), paragraph 1.1 5), paragraph 1.1 6), paragraph 1.2 (d) and paragraph 1.2 (e) 27) Delete Appendix A : (b) in paragraph 3 (3) 28) Renumbering: paragraph 3 (3) (c) to (b), paragraph 3 (3) (d) to (c), paragraph 3 (3) (e) to (d), paragraph 3 (3) (f) to (e), paragraph 3 (3) (g) to (f),	

RECORD OF AMENDMENTS ANNEX 6 PART III Section I, II

AMENDMENTS				**AMENDMENTS**			
No.	Date applicable	Date entered in HOR	Entered by	No.	Date applicable	Date entered in HOR	Entered by
21	27 APR 2017	1 JUN 2018	OPS				
22	8 NOV 2018	17 MAY 2019	OPS				
23	5 NOV 2020	**xxxxxxx**	OPS				

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DEFINITIONS & ABBREVIATIONS

Definitions

In this requirement, unless the context otherwise requires -

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

(a) unlawful seizure of aircraft in flight,

(b) unlawful seizure of aircraft on the ground,

(c) hostage-taking on board an aircraft or on aerodromes,

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

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

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

Aerodrome. A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

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

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

Note.— The aircraft operating manual is part of the operations manual.

Air operator certificate (AOC). A certificate authorizing an operator to carry out specified commercial air transport operations.

Air traffic service (ATS). A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).

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

Alternate heliport. A heliport to which a helicopter may proceed when it becomes either impossible or inadvisable to proceed to or to land at the heliport of intended landing where the necessary services and facilities are available, where aircraft performance requirements can be met and which is operational at the expected time of use. Alternate heliports include the following:

Take-off alternate. An alternate heliport at which a helicopter would be able to land should this become necessary shortly after take-off and it is not possible to use the heliport of departure.

En-route alternate. An alternate heliport at which a helicopter would be able to land in the event that a diversion becomes necessary while en-route.

Destination alternate. An alternate heliport at which a helicopter would be able to land should it become either impossible or inadvisable to land at the heliport of intended landing.

Note. — The heliport from which a flight departs may be an en-route or a destination alternate heliport for that flight.

Approach and landing phase — helicopters. That part of the flight from 300 m (1 000 ft) above the elevation of the FATO, if the flight is planned to exceed this height, or from the commencement of the descent in the other cases, to landing or to the balked landing point.

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

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

Cabin crew member. A crew member who performs, in the interest of safety of passengers, duties assigned by the operator or the pilot-in-command of the aircraft, but who shall not act as a flight crew member.

Combined vision system (CVS). A system to display images from a combination of an enhanced vision system (EVS) and a synthetic vision system (SVS).

Commercial air transport operation. An aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire.

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

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

Congested hostile environment. A hostile environment within a congested area.

Continuing airworthiness. The set of processes by which an aircraft, engine, rotor or part complies with the applicable airworthiness requirements and remains in a condition for safe operation throughout its operating life.

Continuing airworthiness records. Records which are related to the continuing airworthiness status of an aircraft, engine, rotor or associated part.

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

Crew member. A person assigned by an operator to duty on an aircraft during a flight duty period.

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.

Note. — Dangerous goods are classified in Annex 18, Chapter 3.

Decision altitude (DA) *or* ***decision height (DH).*** A specified altitude or height in a three-dimensional (3D) instrument approach operation at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

Note 1. — Decision altitude (DA) is referenced to mean sea level and decision height (DH) is referenced to the threshold elevation.

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

Note 3. — For convenience where both expressions are used they may be written in the form "decision altitude/height" and abbreviated "DA/H".

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 one engine inoperative, is not assured and a forced landing may be required.

Note.— Defined points apply to helicopters operating in performance Class 2 only.

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 one engine inoperative, is not assured and a forced landing may be required.

Note.— Defined points apply to helicopters operating in performance Class 2 only.

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

Elevated heliport. A heliport located on a raised structure on land.

Emergency locator transmitter (ELT). A generic term describing equipment which broadcast distinctive signals on designated frequencies and, depending on application, may be automatically activated by impact or be manually activated. An ELT may be any of the following:

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

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

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

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

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

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

Note.— EVS does not include night vision imaging systems (NVIS).

En-route phase. That part of the flight from the end of the take-off and initial climb phase to the commencement of the approach and landing phase.

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

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. Where the FATO is to be used by helicopters operating in performance Class 1, the defined area includes the rejected take-off area available.

Final approach segment (FAS). That segment of an instrument approach procedure in which alignment and descent for landing are accomplished.

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

Flight duty period. The total time from the moment a flight crew member commences duty, immediately subsequent to a rest period and prior to making a flight or a series of flights, to the moment the flight crew member is relieved of all duties having completed such flight or series of flights.

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

Flight operations officer/ flight dispatcher. A person designated by the operator to engage in the control and supervision of flight operations, whether licensed or not, suitably qualified in accordance with Annex 1, who supports, briefs and/or assists the pilot-in-command in the safe conduct of the flight.

Flight plan. Specified information provided to air traffic services units, relative to an intended flight or portion of a flight of an aircraft.

Flight recorder. Any type of recorder installed in the aircraft for the purpose of complementing accident/incident investigation.

Automatic deployable flight recorder (ADFR). A combination flight recorder installed on the aircraft which is capable of automatically deploying from the aircraft.

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

Flight simulation training device. Any one of the following three types of apparatus in which flight conditions are simulated on the ground:

A flight simulator, which provides an accurate representation of the flight deck of a particular aircraft type to the extent that the mechanical, electrical, electronic, etc. aircraft systems control functions, the normal environment of flight crew members, and the performance and flight characteristics of that type of aircraft are realistically simulated;

A flight procedures trainer, which provides a realistic flight deck environment, and which simulates instrument responses, simple control functions of mechanical, electrical, electronic, etc. aircraft systems, and the performance and flight characteristics of aircraft of a particular class;

A basic instrument flight trainer, which is equipped with appropriate instruments, and which simulates the flight deck environment of an aircraft in flight in instrument flight conditions.

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

Note 1.— The State may provide guidance in those cases where the definition of flight time does not describe or permit normal practices. Examples are: crew change without stopping the rotors; and rotors running engine wash procedure following a flight. In any case, the time when rotors are running between sectors of a flight is included within the calculation of flight time.

Note 2.— This definition is intended only for the purpose of flight and duty time regulations.

General aviation operation. An aircraft operation other than a commercial air transport operation or an aerial work operation.

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

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

Helicopter. A heavier-than-air aircraft supported in flight chiefly by the reactions of the air on one or more power-driven rotors on substantially vertical axes.

Note.— Some States use the term "rotorcraft" as an alternative to "helicopter".

Helideck. A heliport located on a floating or fixed offshore structure.

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

Note 1.— Throughout this 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 areas other than heliports.

Heliport operating minima. The limits of usability of a heliport for:

(a) take- off, expressed in terms of runway visual range and/ or visibility and, if necessary, cloud conditions;

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

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

Hostile environment. An environment in which:

(a) a safe forced landing cannot be accomplished because the surface and surrounding environment are 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.

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

***Human performance*.** Human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

Instrument approach operations. An approach and landing using instruments for navigation guidance based on an instrument approach procedure. There are two methods for executing instrument approach operations:

(a) a two- dimensional (2D) instrument approach operation, using lateral navigation guidance only; and

(b) a three- dimensional (3D) instrument approach operation, using both lateral and vertical navigation guidance.

Note. — Lateral and vertical navigation guidance refers to the guidance provided either by:

a) a ground-based radio navigation aid; or

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

Instrument approach procedure (IAP). A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en- route obstacle clearance criteria apply. Instrument approach procedures are classified as follows:

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

Note. — Non- precision approach procedures may be flown using a continuous descent final approach (CDFA) technique. CDFAs with advisory VNAV guidance calculated by on-board equipment (see PANS- OPS (Doc 8168), Volume I, Part II, Section 5, Chapter 1, 1. 9. 1) are considered 3D instrument approach operations. CDFAs with manual calculation of the required rate of descent are considered 2D instrument approach operations. For more information on CDFAs, refer to PANS- OPS (Doc 8168), Volume I, Part II, Section 5, Chapter 1, 1.8 and 1.9.

Approach procedure with vertical guidance (APV). A performance- based navigation (PBN) instrument approach procedure designed for 3D instrument approach operations Type A.

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

Note.— Refer to Chapter 2, 2.2.8.3, for instrument approach operation types.

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

Note. — The specified minima for visual meteorological conditions are contained in AOCR Appendix T.

Integrated survival suit. A survival suit which meets the combined requirements of the survival suit and life jacket.

Landing decision point (LDP). The point used in determining landing performance from which, an engine failure occurring at this point, the landing may be safely continued or a balked landing initiated.

Note.— LDP applies only to helicopters operating in performance Class 1.

Low-visibility operations (LVO). Approach operations in RVRs less than 550 m and/or with a DH less than 60 m (200 ft) or take-off operations in RVRs less than 400 m.

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

Maintenance organization's procedures manual. A document endorsed by the head of the maintenance organization which details the maintenance organization' s structure and management responsibilities, scope of work, description of facilities, maintenance procedures and quality assurance or inspection systems.

Maintenance programme. A document which describes the specific scheduled maintenance tasks and their frequency of completion and related procedures, such as a reliability programme, necessary for the safe operation of those aircraft to which it applies.

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

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

Maximum mass. Maximum certificated take-off mass.

Minimum descent altitude (MDA) or ***minimum descent height (MDH).*** A specified altitude or height in a 2D instrument approach operation or circling approach operation below which descent must not be made without the required visual reference.

Note 1. — Minimum descent altitude (MDA) is referenced to mean sea level and minimum descent height (MDH) is referenced to the aerodrome elevation or to the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. A minimum descent height for a circling approach is referenced to the aerodrome elevation.

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

Note 3. — For convenience when both expressions are used they may be written in the form "minimum descent altitude/height" and abbreviated "MDA/H".

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

Modification. A change to the type design of an aircraft, engine or propeller.

Note.— A modification may also include the embodiment of the modification which is a maintenance task subject to a maintenance release.

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

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

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

Note 1.— The Performance- based Navigation (PBN) Manual *(Doc 9613), Volume II, contains detailed guidance on navigation specifications.*

Note 2. — The term RNP, previously defined as "a statement of the navigation performance necessary for operation within a defined airspace", has been removed from this Annex as the concept of RNP has been overtaken by the concept of PBN. The term RNP in this Annex is now solely used in the context of navigation specifications that require performance monitoring and alerting, e.g. RNP 4 refers to the aircraft and operating requirements, including a 4 NM lateral performance with on- board performance monitoring and alerting that are detailed in Doc 9613.

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

Note. — Civil twilight ends in the evening when the centre of the sun's disc is 6 degrees below the horizon and begins in the morning when the centre of the sun's disc is 6 degrees below the horizon.

Non-congested hostile environment. A hostile environment outside a congested area.

Non-hostile environment. An environment in which:

(a) a safe forced landing can be accomplished because the surface and surrounding environment are adequate;

(b) the helicopter occupants can be adequately protected from the elements;

(c) search and rescue response/ capability is provided consistent with anticipated exposure; and

(d) the assessed risk of endangering persons or property on the ground is acceptable.

Note.— Those parts of a congested area satisfying the above requirements are considered non- hostile.

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

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

Note 2. — For convenience when both expressions are used they may be written in the form "obstacle clearance altitude/height" and abbreviated "OCA/H".

Offshore operations. Operations which routinely have a substantial proportion of the flight conducted over sea areas to or from offshore locations. Such operations include, but are not limited to, support of offshore oil, gas and mineral exploitation and sea-pilot transfer.

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

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

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

Operational flight plan. The operator's plan for the safe conduct of the flight based on considerations of helicopter performance, other operating limitations and relevant expected conditions on the route to be followed and at the heliports concerned.

Operations in performance Class 1. Operations with performance such that, in the event of a critical engine failure, performance is available to enable the helicopter to safely continue the flight to an appropriate landing area, unless the failure occurs prior to reaching the take-off decision point (TDP) or after passing the landing decision point (LDP), in which cases

the helicopter must be able to land within the rejected take-off or landing area.

Operations in performance Class 2. Operations with performance such that, in the event of critical engine failure, performance is available to enable the helicopter to safely continue the flight to an appropriate landing area, 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.

Operations in performance Class 3. Operations with performance such that, in the event of an engine failure at any time during the flight, a forced landing will be required.

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

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

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

Operator's maintenance control manual. A document which describes the operator's procedures necessary to ensure that all scheduled and unscheduled maintenance is performed on the operator's aircraft on time and in a controlled and satisfactory manner.

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

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

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

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

Performance- based surveillance (PBS). Surveillance based on performance specifications applied to the provision of air traffic services.

Note. — An RSP specification includes surveillance performance requirements that are allocated to system components in terms of the surveillance to be provided and associated

data delivery time, continuity, availability, integrity, accuracy of the surveillance data, safety and functionality needed for the proposed operation in the context of a particular airspace concept.

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

Point of no return. The last possible geographic point at which an aircraft can proceed to the destination aerodrome as well as to an available en-route alternate aerodrome for a given flight.

Psychoactive substances. Alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine, other psychostimulants, hallucinogens, and volatile solvents, whereas coffee and tobacco are excluded.

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

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

Required surveillance performance (RSP) specification. A set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based surveillance.

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

Safe forced landing. Unavoidable landing or ditching with a reasonable expectancy of no injuries to persons in the aircraft or on the surface.

Safety management system (SMS). A systematic approach to managing safety, including the necessary organizational structures, accountability, responsibilities, policies and procedures.

Series of flights. Series of flights are consecutive flights that:

(a) begin and end within a period of 24 hours; and

(b) are all conducted by the same pilot-in-command.

Specific approval. A specific approval is an approval which is documented in the operations specifications for commercial air transport operations or in the list of specific approvals for non-commercial operations.

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

Note.— In the case of the registration of aircraft of an international operating agency on other than a national basis, the States constituting the agency are jointly and severally bound to assume the obligations which, under the Chicago Convention, attach to a State of Registry. See, in this regard, the Council Resolution of 14 December 1967 on Nationality and Registration of Aircraft Operated by International Operating Agencies which can be found in Policy and Guidance Material on the Economic Regulation of International Air Transport *(Doc 9587).*

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

Note.— State of the Aerodrome includes heliports and landing locations.

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

Synthetic vision system (SVS). A system to display data- derived synthetic images of the external scene from the perspective of the flight deck.

Take-off and initial climb phase. That part of the flight from the start of take-off to 300 m (1 000 ft) above the elevation of the FATO, if the flight is planned to exceed this height, or to the end of the climb in the other cases.

Take- off decision point (TDP). The point used in determining take- off performance from which, an engine failure occurring at this point, either a rejected take-off may be made or a take- off safely continued.

Note.— TDP applies only to helicopters operating in performance Class 1.

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

Note.— The specified minima are contained in AOCR, Appendix T.

VTOSS. The minimum speed at which climb shall be achieved with the critical engine inoperative, the remaining engines operating within approved operating limits.

Note.— The speed referred to above may be measured by instrument indications or achieved by a procedure specified in the flight manual.

Abbreviations

ACAS Airborne collision avoidance systems
ADRS Aircraft data recording system
ADS-C Automatic dependent surveillance — contract
AFCS Automatic flight control system
AIR Airborne image recorder
AIRS Airborne image recording system
AOC Air operator certificate
AOCR Air Operator Certificate Requirements
APCH Approach
AR Authorization required
ATC Air traffic control
ATM Air traffic management
ATN Aeronautical telecommunication network
ATS Air traffic services
CAAT The Civil Aviation Authority of Thailand
CARS Cockpit audio recording system
CAT I Category I
CAT II Category II
CAT III Category III
CAT IIIA Category IIIA
CAT IIIB Category IIIB
CAT IIIC Category IIIC
CFIT Controlled flight into terrain
cm Centimetre
CPDLC Controller-pilot data link communications
CVR Cockpit voice recorder
CVS Combined vision system
DA Decision altitude
DA/H Decision altitude/height
DH Decision height
DLR Data link recorder
DLRS Data link recording system
DME Distance measuring equipment
EFB Electronic flight bag
EFIS Electronic flight instrument system
EGT Exhaust gas temperature
EICAS Engine indication and crew alerting system
ELT Emergency locator transmitter
ELT(AD) Automatic deployable
ELT ELT(AF) Automatic fixed
ELT ELT(AP) Automatic portable
ELT ELT(S) Survival ELT
EPR Engine pressure ratio
EUROCAE European Organization for Civil Aviation Equipment
EVS Enhanced vision system
FANS Future air navigation system
FATO Final approach and take-off area
FDR Flight data recorder
FM Frequency modulation ft Foot
g Normal acceleration
hPa Hectopascal
HUD Head-up display
HEMS Helicopter Emergency Medical Service

IFR Instrument flight rules
ILS Instrument landing system
IMC Instrument meteorological conditions
inHg Inch of mercury
kg Kilogram
km Kilometre
kN Kilonewton
kt Knot
LDAH Landing distance available
LDP Landing decision point
LDRH Landing distance required
LED Light emitting diode
m Metre
mb Millibar
MDA Minimum descent altitude
MDA/H Minimum descent altitude/height
DH Minimum descent height
MEL Minimum equipment list
MHz Megahertz
MLS Microwave landing system
MMEL Master minimum equipment list
MOPS Minimum operational performance specification
N1 Low pressure compressor speed (two-stage compressor); fan speed (three-stage compressor)
NM Nautical mile
NVIS Night vision imaging systems
OCA Obstacle clearance altitude
OCA/H Obstacle clearance altitude/height
OCH Obstacle clearance height
PANS Procedures for Air Navigation Services
PBC Performance-based communication
PBN Performance-based navigation
PBS Performance-based surveillance
PNR Point of no return
psi Pound per square inch R Rotor radius
RCP Required communication performance
RNAV Area navigation
RNP Required navigation performance
RSP Required surveillance performance
RTCA Radio Technical Commission for Aeronautics
RVR Runway visual range
SI International System of Units
SOP Standard operating procedure
SVS Synthetic vision system
T4 Engine exhaust gas temperature
TDP Take-off decision point
TIT Turbine inlet temperature
TLOF Touchdown and lift-off area
TODAH Take-off distance available
TODRH Take-off distance required
UTC Coordinated universal time
VFR Visual flight rules
VMC Visual meteorological conditions
VNAV Vertical navigation
VTOSS Take-off safety speed
Vy Best rate of climb speed
°C Degrees Celsius
% Per cent

CHAPTER 1 GENERAL

1.1 COMPLIANCE WITH LAWS, REGULATIONS AND PROCEDURES

1.1.1 The operator of Thai registered helicopter shall ensure that all employees when abroad know that they must comply with the laws, regulations and procedures of those States in which their operations are conducted.

1.1.2 The operator of Thai registered helicopter shall ensure that 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 heliports to be used and the air navigation facilities relating thereto. The operator shall ensure that other members of the flight crew are familiar with such of these 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. Obstacle clearance criteria and procedures used in certain States may differ from PANS-OPS, and knowledge of these differences is important for safety reasons.*

1.1.3 The operator of Thai registered helicopter or a designated representative shall have responsibility for operational control.

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

1.1.5 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 chapter 2, paragraph 2.6.1 shall include, where necessary, notification to the appropriate authorities of the nature of the situation without delay, and requests for assistance if required.

1.1.6 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 to CAAT in accordance with The Civil Aviation Authority of Thailand Requirement No.22 on "Occurrence Reporting in Civil Aviation".

1.1.7 The operators of Thai registered helicopter 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 helicopter will be flown.

1.1.8 The operators of Thai registered helicopter shall ensure that flight crew members demonstrate the ability to speak and understand the language used for radiotelephony communications as specified in Announcement of The Civil Aviation Authority of Thailand on Language Proficiency Rating.

1.2 *Reserved*

1.3 SAFETY MANAGEMENT

1.3.1 The operator of Thai registered helicopter of a certified take-off mass in excess of 7000 kg or having a passenger seating configuration of more than 9 and fitted with a flight data recorder should establish and maintain a flight data analysis programme as part of its safety management system.

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

Note – As of 7 Nov 2019, guidance on the establishment of flight data analysis programmes shall be non-punitive is included in the Manual on Flight Data Analysis Programmes (FDAP) Doc 10000

1.3.3 As of 7 November 2019, States shall not allow 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:

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

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

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

d) de-identified; or

e) disclosed under secure procedures.

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

1.3.4 The operator of Thai registered helicopter shall establish a safety management system in order to achieve an acceptable level of safety by the CAAT.

1.3.5 The operator of Thai registered helicopter shall implement an acceptable safety management system that, as a minimum:

(a) Identifies safety hazards.

(b) ensures the implementation of remedial action necessary to maintain acceptable level of safety.

(c) provides for continuous monitoring and regular assessment of the safety performance.

(d) aims at a continuous improvement of the overall performance of the safety management system.

1.3.6 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.

1.3.7 The operator of Thai registered helicopter shall establish a flight safety documents system, for the use and guidance of operational personnel as part of its safety management system.

1.3.8 The safety management system shall be according to the CAAT Guidance Material for Safety Management Systems and shall address the following:

(a) Safety policy and objectives

1) Management commitment and responsibility

2) Safety accountabilities and responsibility

3) Appointment of key safety personnel

4) Emergency response planning

5) Documentation and record

(b) Safety risk management

1) Hazard identification processes

2) Risk assessment and mitigation processes

(c) Safety assurance

1) Safety performance monitoring and measurement

2) Management of change

3) Continuous improvement and audit

4) Safety promotion

5) Training and education

6) Safety communication

1.2 DANGEROUS GOODS

1.2.1 The operator of Thai registered helicopter shall comply with AOCR with respect to control of and carriage of Dangerous Goods.

CHAPTER 2 FLIGHT OPERATIONS

2.1 OPERATING FACILITIES

2.1.1 The operator of Thai registered helicopter shall ensure that a flight will not be commenced unless it has been ascertained by every reasonable means available that the ground and/or water facilities available and directly required on such flight, for the safe operation of the helicopter and the protection of the passengers, are adequate for the type of operation under which the flight is to be conducted and are adequately operated for this purpose.

2.1.2 The operator of Thai registered helicopter shall ensure that any inadequacy of facilities observed in the course of operations is reported to the CAAT, without undue delay. The required facilities which are published in Aeronautical Information Publication: AIP or Notice to Airmen: NOTAM shall be available for operations during the publish time in any weather condition.

2.2 OPERATIONAL CERTIFICATION AND SUPERVISION

2.2.1 **Air Operator Certificate;**

2.2.1.1 An operator of Thai registered helicopter shall not engage in commercial air transport operations unless in possession of a valid Air Operator Certificate issued in accordance with AOCR, Chapter 1.

2.2.1.2 The operator of Thai registered helicopter shall conduct commercial air transport operations in accordance with the operations specifications issued by the CAAT.

2.2.1.3 The issue of the Air Operator certificate by the CAAT is dependent on the organisation demonstrating an adequate organisation, 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.

2.2.1.4 The continued validity of an air operator certificate shall depend upon the operator maintaining the requirements of paragraph 2.2.1.3 under the supervision of the CAAT.

2.2.1.5 The air operator certificate and operations specifications associated with the air operator certificate shall contain the information in accordance with AOCR, Appendix A.

2.2.2 ***(*Reserved*)***

2.2.3 Operations Manual

2.2.3.1 The operator of Thai registered helicopter shall make available, for the use and guidance of operations personnel concerned, an operation manual constructed using the guidance contained in AOCR Chapter 2 and Appendix K2. The operations manual shall be amended or revised as is necessary to ensure that the information contained therein is kept up to date. All such amendments or revisions shall be notified to all personnel that are required to use this manual.

2.2.3.2 The operator of Thai registered helicopter shall provide a copy of the operations manual together with all amendments and/ or revisions, for review and acceptance and, where required, to the CAAT for approval.

2.2.3.3 The operator of Thai registered helicopter shall incorporate in the operations manual such mandatory material as the CAAT may require.

2.2.4 Operating Instructions – General

2.2.4.1 The operator of Thai registered helicopter shall ensure that all operations personnel are properly instructed in their particular duties and responsibilities and the relationship of such duties to the operation as a whole.

2.2.4.2 A helicopter rotor shall not 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.

2.2.4.3 The operator of Thai registered helicopter 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 take-off and initial climb phase for the existing take-off conditions and intended take- off technique. This information shall be based on the helicopter manufacturer's data and shall be included in the operations manual.

2.2.5 In-Flight Simulation of Emergency Situations

An operator of Thai registered helicopter shall ensure that when passengers or cargo are being carried, no emergency or abnormal situations shall be simulated.

2.2.6 Checklists

The operator of Thai registered helicopter shall provide the checklists to be used by flight crews prior to, during and after all phases of operations, and in emergency, to ensure compliance with the operating procedures contained in the aircraft operating manual, the flight manual or other documents associated with the certificate of airworthiness and

otherwise in the operations manual. The design and utilization of checklists shall observe Human Factors principles. The checklists constructed using the guidance contained in AOCR.

2.2.7 Minimum Flight Altitudes (Operations Under IFR)

2.2.7.1 The operator of Thai registered helicopter shall establish minimum flight altitudes for those routes flown for which minimum flight altitudes have been established by the State flown over or the Kingdom of Thailand, provided that they are not less than those established by that State, unless specifically approved.

2.2.7.2 The operator of Thai registered helicopter shall specify the method by which it is intended to determine minimum flight altitudes for operations conducted over routes for which minimum flight altitudes have not been established by the State flown over, or the Kingdom of Thailand, and shall include this method in the operations manual. The minimum flight altitudes determined in accordance with the above method shall not be lower than specified in Regulation on Civil Aviation Board (RCAB) No. 94 on Rules of The Air.

2.2.8 Heliport or Landing Location Operating Minima

2.2.8.1 The operator of Thai registered helicopter shall establish operating minima for each heliport or landing location to be used in operations and the method of determination of such minima shall be approved by the CAAT. Such minima shall not be lower than any that may be established for such heliports or landing locations by the responsible authority or agency for the state in which the heliport or landing location is located, except when specifically approved by that State. Refer to AOCR Appendix B.

2.2.8.2 Operational credit(s) for operations with helicopters equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS shall be authorized by the CAAT. Where the operational credit relates to low visibility operations, the operator shall obtain a specific approval from the CAAT. Such authorizations shall not affect the classification of the instrument approach procedure.

Note. – Operational credit includes:

a) for the purposes of an approach ban (2.4.1.2), a minima below the heliport or landing location operating minima;

b) reducing or satisfying the visibility requirements; or

c) requiring fewer ground facilities as compensated for by airborne capabilities.

2.2.8.3 The operator of Thai registered helicopter shall establish the heliport or landing location operating minima which will apply to any particular operation and shall take full account of:

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

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

(c) the physical characteristics of the heliport, and direction of approach;

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

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

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

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

(h) the obstacles in the climb-out areas and necessary clearance margins**;**

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

(j) any minima that may be promulgated by the State of the Aerodrome.

2.2.8.4 The operator of Thai registered helicopter shall classify instrument approach operations based on 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 800m 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 30 m **(**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 III would be considered a CAT III operation or an operation with a DH in the range of CAT II but with an RVR in the range of CAT I would be considered a CAT II operation). This does not apply if the RVR and/or DH has been approved as operational credits.

Note 2.— The 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.— 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).

2.2.8.5 The operator of Thai registered helicopter shall not conduct instrument approach operations in low visibility which shall only be conducted when RVR information is provided unless specific approval by CAAT is obtained.

Note.— Guidance on low visibility operations is contained in the Manual of All-Weather Operations (Doc 9365).

2.2.8.6 For take-off in low visibility, the operator of Thai registered helicopter shall obtain specific approval for the minimum take off RVR from the CAAT.

Note.— In general, visibility for take-off is defined in terms of RVR. An equivalent horizontal visibility may also be used.

2.2.8.7 For instrument approach operations, heliport or landing location operating minima below 800 m visibility shall not be authorized unless RVR information or an accurate measurement or observation of visibility is provided**.**

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

2.2.8.9 The operating minima for 3D instrument approach operations using instrument approach procedures shall be determined by establishing a decision altitude **(**DA**)** or

decision height (DH) and the minimum visibility or RVR.

2.2.8.10 For Take-off minima, Required RVR/Visibility, Non-Precision Approach, Precision approach Category I Operations, Visual Flight Rules Operating Minima, Onshore Circling, Airborne Radar Approach (ARA), Helicopter equipped with automatic landing systems, HUD, EVS, SVS or CVS, the operator shall establish and maintain in accordance with AOCR Chapter 9.

2.2.9 Fuel and Oil records

2.2.9.1 The operator of Thai registered helicopter shall maintain fuel and oil records to enable the CAAT to ascertain that, for each flight, the requirements of paragraph 2.3.6 have been complied with.

2.2.9.2 Fuel and oil records of every flight shall be retained by the operator for a period at least 3 months.

2.2.10 Crew

2.2.10.1 Pilot in Command

For each flight, the operator shall designate one pilot to act as pilot-in-command.

2.2.10.2 Flight time, flight duty periods, rest periods

An operator of Thai registered helicopter shall formulate rules to limit flight time and flight duty periods and for the provision of adequate rest periods for all its crew members to ensure proper fatigue management was performed. These rules shall be in accordance with Announcement of the Civil Aviation Authority of Thailand on Flight Time and Flight Duty Period Limitation requirements and included in the operations manual.

2.2.10.3 If there is any necessity to deviate from the Announcement of the Civil Aviation Authority of Thailand on Flight Time and Flight Duty Period Limitation requirement, the operator shall determine the different operations procedure and demonstrate a level of safety which shall be acceptable to the CAAT.

2.2.10.4 The operator of Thai registered helicopter shall maintain current records of the flight time, flight duty periods and rest periods of all its crew members for a period of 15 months from the date of crew member's duty.

2.2.11 Passengers

2.2.11.1 An operator of Thai registered helicopter shall ensure that passengers are made familiar with the location and use of:

(a) seat belts or harnesses;

(b) emergency exits;

(c) life jackets, if the carriage of life jackets is prescribed;

(d) oxygen dispensing equipment, if the provision of oxygen for the use of passengers is prescribed; and

(e) other emergency equipment provided for individual use, including passenger emergency briefing cards.

2.2.11.2 The operator of Thai registered helicopter shall ensure that the passengers are informed of the location and general manner of use of the principal emergency equipment carried for collective use.

2.2.11.3 In an emergency during flight, passengers shall be instructed in such emergency action as may be appropriate to the circumstances.

2.2.11.4 The operator of Thai registered helicopter shall ensure that, during take- off and landing and whenever considered necessary by reason of turbulence or any emergency occurring during flight, all passengers on board a helicopter shall be secured in them by means of the seat belts or harnesses provided.

2.2.12 Over-water flights

All helicopters on flights over water in a hostile environment in accordance with Chapter 4 paragraph 4.5.1 shall be certificated for ditching. Sea state shall be an integral part of ditching information.

2.3 FLIGHT PREPARATION

2.3.1 A flight, or series of flights, shall not be commenced until flight preparation forms have been completed certifying that the pilot-in-command is satisfied that:

(a) the helicopter is airworthy.

(b) the instruments and equipment prescribed in Chapter 4 of this requirement, for the particular type of operation to be undertaken, are installed and are sufficient for the flight.

(c) a maintenance release as prescribed in Chapter 6 of this requirement has been issued in respect of the helicopter.

(d) the mass of the helicopter and centre of gravity location are such that the flight can be conducted safely, taking into account the flight conditions expected.

(e) any load carried is properly distributed and safely secured.

(f) a check has been completed indicating that the operating limitations of Chapter 3 of this requirement can be complied with for the flight to be undertaken.

(g) the Standards of paragraph 2.3.3 of this requirement relating to operational flight planning have been complied with.

2.3.2 Completed flight preparation forms shall be kept by an operator for a period of at least 3 months.

2.3.3 Operational flight planning

2.3.3.1 An operational flight plan shall be completed for every intended flight or series of flights, and approved by the pilot- in- command, and flight operations officer if he/ she completes the operational flight plan. It shall be lodged with the appropriate authority. The operator shall determine the most efficient means of lodging the operational flight plan.

2.3.3.2 The details of operational flight plans are in accordance with AOCR, Chapter 5, Para 11.3. The operations manual shall describe the content and use of the operational flight plan.

2.3.4 Alternate heliports

2.3.4.1 Take-off alternate heliport

(a) A take- off alternate heliport shall be selected and specified in the operational flight plan if the weather conditions at the heliport of departure are at or below the applicable heliport operating minima.

(b) For a heliport to be selected as a take- off alternate, the available information shall indicate that, at the estimated time of use, the conditions will be at or above the heliport operating minima for that operation.

2.3.4.2 Destination Alternate Heliport

(a) For a flight to be conducted in accordance with IFR, at least one destination alternate shall be specified in the operational flight plan and the flight plan, unless:

1) the duration of the flight and the meteorological conditions prevailing are such that there is reasonable certainty that, at the estimated time of arrival at the heliport of intended landing, and for a reasonable period before and after such time, the approach and landing may be made under visual meteorological conditions as prescribed by the CAAT; or

2) the heliport of intended landing is isolated and no suitable alternate is available. A point of no return (PNR) shall be determined.

(b) For a heliport to be selected as a destination alternate, the available information shall indicate that, at the estimated time of use, the conditions will be at or above the heliport operating minima for that operation.

(c) For a flight departing to a destination which is forecast to be below the heliport operating minima, two destination alternates shall be selected**.** The first destination alternate should be at or above the heliport operating minima for destination and the second at or above the heliport operating minima for alternate**.**

2.3.4.3 When an off**-** shore alternate heliport is specified, it shall be specified subject to the following**:**

(a) the offshore alternates shall be used only after a PNR**.** Prior to a PNR, onshore alternates shall be used**.**

(b) mechanical reliability of critical control systems and critical components shall be considered and taken into account when determining the suitability of the alternates**.**

(c) one engine inoperative performance capability shall be attainable prior to arrival at the alternate**.**

(d) to the extent possible, deck availability shall be guaranteed**.**

(e) weather information must be reliable and accurate**.**

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

2.3.4.4 Offshore alternates shall not be used when it is possible to carry enough fuel to have an onshore alternate**.** Offshore alternates should not be used in a hostile environment**.**

2.3.5 Meteorological Conditions

2.3.5.1 A flight to be conducted in accordance with VFR shall not be commenced unless current meteorological reports or a combination of current reports and forecasts indicate that the meteorological conditions along the route or that part of the route to be flown or in the intended area of operations under VFR will, at the appropriate time, be such as to enable compliance with these rules and in accordance with the minimum visibilities for VFR operations stated in AOCR, Appendix T**.**

2.3.5.2 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**.**

2.3.5.3 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 CAAT, 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 (Doc 9976).

2.3.5.4 A flight to be operated in known or expected icing conditions shall not be commenced unless the helicopter is certificated and equipped to cope with such conditions.

2.3.5.5 A flight to be planned or expected to operate in suspected or known ground icing conditions shall not be commenced unless the helicopter has been inspected for icing and, if necessary, has been given appropriate de- icing/ anti- icing treatment. Accumulation of ice or other naturally occurring contaminants shall be removed so that the helicopter is kept in an airworthy condition prior to take-off.

Note.— Guidance material is given in the Manual of Aircraft Ground De-icing/Anti-icing Operations (Doc 9640).

2.3.6 Fuel and Oil Requirements

2.3.6.1 ***All helicopters***. 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.

2.3.6.2 ***VFR operations***. The fuel and oil carried in order to comply with paragraph 2.3.6.1 shall, in the case of VFR operations, be at least the amount to allow the helicopter to:

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

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

(c) 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 CAAT.

2.3.6.3 ***IFR operations***. The fuel and oil carried in order to comply with paragraph 2.3.6.1 shall, in the case of IFR operations, be at least the amount to allow the helicopter:

(a) When an alternate is not required, in terms of paragraph 2.3.4.2 (a) 1), to fly to and execute an approach at the heliport or landing location to which the flight is planned, and thereafter to have:

1) final reserve fuel to fly 30 minutes at holding speed at 450 m (1500ft) above the destination heliport or landing location under standard temperature conditions and approach and land; and

2) 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 CAAT.

(b) 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:

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

2) 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

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 CAAT.

(c) When no alternate heliport or landing location is available, in terms of paragraph 2.3.4.2(a) (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 that will, based on geographic and environmental considerations, enable a safe landing to be made.

2.3.6.4 In computing the fuel and oil required in paragraph 2.3.6.1, at least the following shall be considered:

(a) meteorological conditions forecast;

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

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

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

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

2.3.6.5 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.

2.3.7 Refuelling with passengers on board or rotors turning

Note.— Except where otherwise stated, all helicopter refuelling provisions relate to operations using jet fuels. See 2.3.7.5 for restrictions specific to AVGAS/wide cut fuels.

2.3.7.1 A Thai registered helicopter shall not be refuelled, rotors stopped or turning, when:

(a) passengers are embarking or disembarking; or

(b) when oxygen is being replenished.

2.3.7.2 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:

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

(b) a constant two-way communication shall be maintained by the helicopter's intercommunication system or other suitable means between the ground crew supervising the refueling 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.

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

2.3.7.3 The operator of Thai registered helicopter shall establish procedures and specify conditions under which such refueling may be carried out.

2.3.7.4 In addition to the requirements of 2.3.7.2, operational procedures should specify that at least the following precautions are taken:

(a) doors on the refuelling side of the helicopter remain closed where possible, unless these are the only suitable exits;

(b) doors on the non-refuelling side of the helicopter remain open, weather permitting, unless otherwise specified by the RFM;

(c) fire-fighting facilities of the appropriate scale be positioned so as to be immediately available in the event of a fire;

(d) if the presence of fuel vapour is detected inside the helicopter, or any other hazard arises during refuelling, fuelling be stopped immediately;

(e) the ground or deck area beneath the exits intended for emergency evacuation be kept clear;

(f) seat belts should be unfastened to facilitate rapid egress; and

(g) with rotors turning, only ongoing passengers should remain on board.

2.3.7.5 A Thai registered helicopter shall not be refueled with AVGAS (aviation gasoline) or wide- cut type fuel or a mixture of these types of fuel, when passengers are on board.

2.3.7.6 A Thai registered helicopter shall not be defueled at any time when:

(a) passengers remain on board; or

(b) passengers are embarking or disembarking; or

(c) oxygen is being replenished.

Note 1.— Provisions concerning aircraft refueling are contained in the Requirement of CAAT Number 14, and guidance on safe refueling practices is contained in the Airport *Services Manual (Doc 9137), Parts 1 and 8.*

Note 2.— Additional precautions are required when refueling 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.

2.3.8 Oxygen supply;

2.3.8.1 A flight to be operated at flight altitudes at which the atmospheric pressure in personnel compartments will be less than 700 hPa or above 10,000 ft shall not be commenced unless sufficient stored breathing oxygen is carried to supply**:**

(a) all crew members and 10 per cent of the passengers for any period in excess of 30 minutes that the pressure in compartments occupied by them will be between 700 hPa and 620 hPa or height between 10,000 to 13,000 ft; and

(b) the crew and passengers for any period that the atmospheric pressure in compartments occupied by them will be less than 620 hPa or height above 13,000 ft.

2.3.8.2 A flight to be operated with a pressurized 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 pressurization, for any period that the atmospheric pressure in any compartment occupied by them would be less than 700 hPa. In addition, when the helicopter is operated at flight altitudes at which the atmospheric pressure is below 376 hPa or height above 25,000 ft or atmospheric pressure is more than 376 hPa or height below 25,000 ft and cannot descend safely to a flight altitude at which the atmospheric pressure is equal to 620 hPa or height 13,000 ft within four minutes, there shall be no less than a 10- minute supply for the occupants of the passenger compartment.

2.4 IN-FLIGHT PROCEDURES

2.4.1 Heliport operating minima

2.4.1.1 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 effected at that heliport, or at least one alternate heliport, in compliance with the operating minima established in accordance with paragraph 2.2.8.1.

2.4.1.2 An instrument approach shall not be continued below 300 m (1 000 ft) above the heliport elevation or into the final approach segment unless the reported visibility or controlling RVR is at or above the heliport operating minima.

Note.— Criteria for the final approach segment is contained in PANS-OPS (Doc 8168), Volume II.

2.4.1.3 If, after entering the final approach segment or after descending below 300 m (1000 ft) above the heliport elevation, the reported visibility or controlling RVR falls below the specified minimum, the approach may be continued to DA/ H or MDA/ H. In any case, a helicopter shall not continue its approach-to-land at any heliport beyond a point at which the limits of the operating minima specified for that heliport would be infringed.

2.4.2 Meteorological observations

(a) The operator of Thai registered helicopter shall establish a policy and procedures for its flight crew to record and report meteorological observations observed during flight.

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

(c) The operator of Thai registered helicopter shall require its flight crew to report special observations of the following conditions encountered or observed during climb out and approach:

1) moderate or severe turbulence; or

2) moderate or severe icing; or

3) severe mountain wave; or

4) thunderstorms, without hail, that are obscured, embedded, widespread or in squall lines; or

5) thunderstorms, with hail, that are obscured, embedded, widespread or in

squall lines; or

6) heavy dust-storm or heavy sandstorm.

(d) 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.

Note. — 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 (Doc 4444) and the appropriate Regional Supplementary Procedures (Doc 7030).

2.4.3 Hazardous Flight Conditions

Hazardous flight conditions encountered, other than those associated with meteorological conditions, shall be reported to the appropriate aeronautical station as soon as possible. The reports shall give such details as may be relevant to the safety of other aircraft.

2.4.4 Flight crew members at duty stations

2.4.4.1 **Take-off and landing**

All flight crew members required to be on flight deck duty shall be at their stations.

2.4.4.2 En-route

All flight crew members required to be on flight deck duty shall remain at their stations except when their absence is necessary for the performance of duties in connection with the operation of the helicopter or for physiological needs.

2.4.4.3 Seat belts

All flight crew members shall keep their seat belt fastened when at their stations.

2.4.4.4 Safety harness

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 harness fastened during the take- off and landing phases unless the shoulder straps interfere with the performance of their duties, in which case the shoulder straps may be unfastened but the seat belt must remain fastened.

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

2.4.5 Use of oxygen

All flight crew members, when engaged in performing duties essential to the safe

operation of a helicopter in flight, shall use breathing oxygen continuously whenever the circumstances prevail for which its supply has been required in paragraph 2.3.8.1 or 2.3.8.2.

2.4.6 *(*Reserved*)*

2.4.7 Instrument Flight procedures

2.4.7.1 One or more instrument approach procedures to serve each final approach and take-off area or heliport utilized for instrument flight operations shall be approved and promulgated by the State in which the heliport is located, or by the State which is responsible for the heliport when located outside the territory of any State.

2.4.7.2 All Thai registered helicopters operated in accordance with IFR shall comply with the instrument approach procedures approved by the State in which the heliport is located, or by the State which is responsible for the heliport when located outside the territory of any State.

Note 1.— Operational procedures recommended for the guidance of operations personnel involved in instrument flight operations are described in PANS-OPS (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 (Doc 8168), Volume II. Obstacle clearance criteria and procedures used in certain States may differ from PANS-OPS, and knowledge of these differences is important for safety reasons (see Section II, Chapter 1, 1.1.1).

2.4.8 Helicopter operating procedures for noise abatement

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

2.4.9 In Flight Fuel Management

2.4.9.1 The operator of Thai registered helicopter shall establish policies and procedures, which are approved by the CAAT, to ensure that in- flight fuel checks and fuel management are performed.

2.4.9.2 The pilot- in- command shall monitor the amount of usable fuel remaining on board to ensure it is not less than the fuel required to proceed to a landing site where a safe landing can be made with the planned final reserve fuel remaining.

2.4.9.3 The pilot- in- command shall advise ATC of a minimum fuel state by declaring MINIMUM FUEL when, having committed to land at a specific landing site, the pilot calculates that any change to the existing clearance to that landing site, or other air traffic delays, may result in landing with less than the planned final reserve fuel.

Note 1.— The declaration of MINIMUM FUEL informs ATC that all planned landing site options have been reduced to a specific landing site of intended landing, that no precautionary landing site is available, and any change to the existing clearance, or air traffic delays, may result in landing with less than the planned final reserve fuel. This is not an emergency situation but an indication that an emergency situation is possible should any additional delay occur.

Note 2.— 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.

2.4.9.4 The pilot-in-command shall declare a situation of fuel emergency by broadcasting MAYDAY MAYDAY MAYDAY FUEL, when the usable fuel estimated to be available upon landing at the nearest landing site where a safe landing can be made is less than the required final reserve fuel in compliance with 2.3.6.

Note 1.— The planned final reserve fuel refers to the value calculated in 2.3.6 and is the minimum amount of fuel required upon landing at any landing site. The declaration of MAYDAY MAYDAY 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 to the pilot, 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 as required in Annex 10, Volume II, 5.3.2.1.1, b) 3.

2.5 DUTIES OF PILOT-IN-COMMAND

2.5.1 The pilot-in-command shall be responsible for the operation and safety of the helicopter and for the safety of all crew members, passengers 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.

2.5.2 The pilot-in-command shall ensure that the checklists specified in paragraph 4.3.5 are complied with in detail.

2.5.3 The pilot-in-command shall be responsible for notifying the nearest appropriate authority by the quickest available means of any accident involving the helicopter, resulting in serious injury or death of any person or substantial damage to the helicopter or property.

Note.— A definition of the term "serious injury" is contained in Annex 13.

2.5.4 The pilot-in-command shall be responsible for reporting all known or suspected defects in the helicopter, to the operator, at the termination of the flight.

2.5.5 The pilot-in-command shall be responsible for the journey log book or the general declaration containing the information listed in Chapter 9, paragraph 9.4.

2.6 DUTIES OF FLIGHT OPERATIONS OFFICERS / FLIGHT DISPATCHER

2.6.1 A flight operations officer/ flight dispatcher in conjunction with a method of control and supervision of flight operations in accordance with paragraph 2.2.1.3 shall:

(a) assist the pilot-in-command in flight preparation and provide the relevant Information;

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

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

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

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

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

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

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

2.6.3 The operator of Thai registered helicopter shall provide training for ground staff directly involved with flight operations (including flight operations officers/ flight dispatchers), in particular those employed in operations and traffic departments. The operator shall ensure that the flight operations officer/flight dispatcher demonstrates that he/she has the knowledge; and that he/she maintains familiarisation with all features of the operation which are pertinent to such duties, including the knowledge and skills related to human performance. Further training will be necessary from

time to time **(**e**.**g**.** when new types of aircraft are acquired**)** and the arrangements in this connection will be taken into account in the consideration of applications for the variation of Certificates**.**

The detail requirements for Flight Operations Officer/ Flight Dispatcher are contained in AOCR Appendix L.

2.7 CARRY-ON BAGGAGE

The operator of Thai registered helicopter shall ensure that all baggage carried onto a helicopter and taken into the passenger cabin is adequately and securely stowed**.**

2.8 FATIGUE MANAGEMENT

Refer to AOCR Chapter 2, Paragraph 4 Fatigue Management of Crew, AOCR Appendix C and Appendix C1 for details.

2.9 PSYCHOACTIVE SUBSTANCE

The operator of Thai registered helicopter shall ensure that no crew member shall undertake duties on an aircraft when under the influence of psychoactive substances or alcohol and comply in accordance with the Regulation of Civil Aviation Board No.67 on personnel discipline

CHAPTER 3 HELICOPTER PERFORMANCE OPERATING LIMITATIONS

These requirements shall be complied in conjunction with the requirements of AOCR Chapter 9, Paragraph 10**.**

3.1 GENERAL

3.1.1 A Thai registered helicopters shall be operated in accordance with the CAAT code of performance requirements given in AOCR Chapter 9, Paragraph 10**.** Helicopters operated in performance class 1 shall be certified in category A **(as** defined in Annex 8, Part IV**)** or equivalent as determined by the certifying authority for the state of design**.**

3.1.2 In conditions where the safe continuation of flight is not ensured in the event of a critical engine failure, helicopter operations shall be conducted in conditions of weather and light, and over such routes and diversions, that permit a safe forced landing to be executed.

3.1.3 Notwithstanding the provisions of 3.1.2, CAAT may, based on the result of a risk assessment, allow for variations without a safe forced landing to be included in the Code of Performance established in accordance with the provisions of 3.1.1. The risk assessment shall take into consideration at least the following:

(a) the type and circumstances of the operation;

(b) the area/terrain over which the operation is being conducted;

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

(d) the procedures and systems for monitoring and maintaining the reliability of the engine(s);

(e) the training and operational procedures to mitigate the consequences of the critical engine failure; and

(f) helicopter equipment.

Note.— 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 The Helicopter Code of Performance Development Manual (Doc 10110)

3.1.4 IMC operations in performance Class 3 are not permitted**.**

3.1.5 For helicopters for which Part IV of Annex 8 is not applicable because of the exemption provided for in Article 41 of the Convention, the operator of Thai registered should ensure that the level of performance specified in 3.2 is met as far as practicable.

3.2 HELICOPTER CERTIFICATED IN ACCORDANCE WITH PART IV OF ANNEX 8

3.2.1 The Standards contained in paragraph 3.2.2 to 3.2.7 inclusive are applicable to the helicopters to which Annex 8, Part IV is applicable**.**

3.2.2 The level of performance defined by the appropriate parts of the CAAT code of performance referred to in paragraph 3.1.1 for the helicopters designated in paragraph 3.2.1 shall be consistent with the overall level embodied in the Standards of this chapter**.**

Note.— Guidance on the level of performance intended by the requirements of this chapter in contained in Doc 10110.

3.2.3 A Thai registered helicopter shall be operated in compliance with the terms of its certificate of airworthiness and within the approved operating limitations contained in its flight manual**.**

3.2.4 The Operator of Thai registered helicopter shall take such precautions as are reasonably possible to ensure that the general level of safety contemplated by these provisions is maintained under all expected operating conditions, including those not covered specifically by the provisions of this Chapter**.**

3.2.5 A flight shall not be commenced unless the performance information provided in the flight manual indicates that the Standards of 3**.**2**.**6 and 3**.**2**.**7 can be complied with for the flight to be undertaken**.**

3.2.6 The operator of Thai registered helicopter shall take account 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.

3.2.7 Mass limitations

(a) The mass of the helicopter at the start of take-off shall not exceed the mass at which the code of performance referred to in paragraph 3**.**1**.**1 is complied with, allowing for expected reductions in mass as the flight proceeds and for such fuel jettisoning as is appropriate**.**

(b) In no case shall the mass at the start of take- off exceed the maximum take-off mass specified in the helicopter flight manual taking into account the factors specified in paragraph 3**.**2**.**6

(c) In no case shall the estimated mass for the expected time of landing at the

destination and at any alternate exceed the maximum landing mass specified in the helicopter flight manual taking into account the factors specified in paragraph 3.2.6.

(d) In no case shall the mass at the start of take-off, or at the expected time of landing at the destination and at any alternate, exceed the relevant maximum mass at which compliance has been demonstrated with the applicable noise certification Standards in Annex 16, Volume I, unless otherwise authorized in exceptional circumstances for a certain operating site where there is no noise disturbance problem, by the competent authority of the State in which the operating site is situated.

3.2.7.1 Take-off and Initial climb phase

(a) Operations in performance Class 1.
The Thai registered helicopter shall be able, in the event of the failure of the critical engine being recognized at or before the take- off decision point, to discontinue the take- off and stop within the rejected take- off area available or, in the event of the failure of the critical engine being recognized at or after the take- off decision point, to continue the take- off, clearing all obstacles along the flight path by an adequate margin until the helicopter is in a position to comply with paragraph 3.2.7.3(a).

(b) Operations in performance Class 2.
The Thai registered helicopter shall be able, in the event of the failure of the critical engine at any time after reaching DPATO, to continue the take- off, clearing all obstacles along the flight path by an adequate margin until the helicopter is in a position to comply with paragraph 3.2.7.3 (a) Before the DPATO, failure of the critical engine may cause the helicopter to force-land; therefore, the conditions stated in paragraph 3.1.2 shall apply.

(c) Operations in performance Class 3.
At any point of the flight path, failure of an engine will cause the helicopter to force-land; therefore, the conditions stated in paragraph 3.1.2 shall apply.

3.2.7.2 En-route phase

(a) Operations in performance Classes 1 and 2.
The helicopter shall be able, in the event of the failure of the critical engine at any point in the en-route phase, to continue the flight to a site at which the conditions of paragraph 3.2.7.4(a). for operations in performance Class 1, or the conditions of paragraph 3.2.7.4(b). for operations in performance Class 2 can be met, without flying below the appropriate minimum flight altitude at any point.

(b) When the en-route phase is conducted over a hostile environment and the diversion time to an alternate would exceed two hours, the operator shall assess the risks associated with a second engine failure.

(c) Operations in performance Class 3.

The helicopter shall be able, with all engines operating, to continue along its intended route or planned diversions without flying at any point below the appropriate minimum flight altitude. At any point of the flight path, failure of an engine will cause the helicopter to force-land; therefore, the conditions stated in paragraph 3.1.2 shall apply.

3.2.7.3 Approach and landing phase

(a) Operations in performance Class 1.
In the event of the failure of the critical engine being recognized at any point during the approach and landing phase, before the landing decision point, the helicopter shall, at the destination and at any alternate, after clearing all obstacles in the approach path, be able to land and stop within the landing distance available or to perform a balked landing and clear all obstacles in the flight path by an adequate margin equivalent to that specified in paragraph 3.2.7.2.(a), in case of the failure occurring after the landing decision point, the helicopter shall be able to land and stop within the landing distance available.

(b) Operations in performance Class 2.
In the event of the failure of the critical engine before the DPBL, the helicopter shall, at the destination and at any alternate, after clearing all obstacles in the approach path, be able either to land and stop within the landing distance available or to perform a balked landing and clear all obstacles in the flight path by an adequate margin equivalent to that specified in 3.2.7.2 (b) After the DPBL, failure of an engine may cause the helicopter to force- land; therefore, the conditions stated in 3.1.2 shall apply.

(c) Operations in performance Class 3.
At any point of the flight path, failure of an engine will cause the helicopter to force-land; therefore, the conditions stated in 3.1.2 shall apply.

3.3 OBSTACLE DATA

The operator of Thai registered helicopter shall use available obstacle data to develop procedures to comply with the take**-**off, initial climb, approach and landing phases detailed in the helicopter code of performance that is published in AOCR Chapter 9, Paragraph 10**.**

CHAPTER 4 HELICOPTER INSTRUMENTS, EQUIPMENT AND FLIGHT DOCUMENTS

The operator of Thai registered helicopter shall operate in accordance with the standard of helicopter instruments, equipment and flight documents as specified in the following requirement.

4.1 GENENRAL

4.1.1 In addition to the minimum equipment necessary for the issuance of a certificate of airworthiness, the instruments, equipment and flight documents prescribed in the following paragraphs shall be installed or carried, as appropriate, in helicopters according to the helicopter used and to the circumstances under which the flight is to be conducted**.** The prescribed instruments and equipment, including their installation, shall be approved or accepted by the CAAT**.**

4.1.2 A Thai registered helicopter shall carry a certified true copy of the air operator certificate specified in Chapter 2 paragraph 2**.**2**.**1, and a copy of the operations specifications relevant to the helicopter type, issued in conjunction with the certificate**.** When the certificate and the associated operations specifications are issued by the CAAT in a language other than English, an English translation shall be included**.**

4.1.3 The operator of Thai registered helicopter shall include in the operations manual, a minimum equipment list (MEL), complying with the Announcement of the Department of Civil Aviation on Approval of Minimum Equipment List B.E. 2555 and AOCR, and approved by the CAAT, which will enable the pilot-in-command to determine whether a flight may be commenced or continued from any intermediate stop should any instrument, equipment or systems become inoperative.

4.1.4 The operator of Thai registered helicopter shall make available to operations staff and crew members an aircraft operating manual, for each aircraft type operated, containing the normal, abnormal and emergency procedures relating to the operation of the aircraft. The manual shall include details of the aircraft systems and of the checklists to be used. The design of the manual shall observe Human Factors principles. The manual shall be easily accessible to the flight crew during all flight operations.

4.2 ALL HELICOPTERS ON ALL FLIGHTS

4.2.1 A Thai registered 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 maneuvers and observe the operating limitations of the helicopter in the expected operating conditions.

4.2.2 A helicopter shall be equipped with:

(a) Accessible and adequate medical supplies;

- Medical supplies should comprise a first- aid kit and for helicopters required to carry cabin crew as part of the operating crew, a universal precaution kit, for the use of cabin crew 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.

(b) portable fire extinguishers of a type which, when discharged, will not cause dangerous contamination of the air within the helicopter. At least one shall be located in:

1) the pilot's compartment; and

2) each passenger compartment that is separate from the pilot' s compartment and that is not readily accessible to the flight crew.

Note 1.— Any portable fire extinguisher so fitted in accordance with the certificate of airworthiness of the helicopter may count as one prescribed.

Note 2.— Refer to paragraph 4.2.2.1 for fire extinguishing agents.

(c) Seats, Belts and Harnesses:

1) A seat or berth for each person over the age of 24 months;

2) a seat belt for each seat and restraining belts for each berth; and

3) a safety harness for each flight crew seat. The safety harness for each pilot seat shall incorporate a device which will automatically restrain the occupant's torso in the event of rapid deceleration.

4) When dual controls are fitted, the safety harness for each pilot seat should incorporate a restraining device to prevent the upper body of an incapacitated occupant from interfering with the flight controls.

Note 1.— Depending on the design, the lock on an inertia reel device may suffice for this purpose.

Note 2.— Safety harness includes shoulder straps and a seat belt which may be used independently.

(d) Means of ensuring that the following information and instructions are conveyed to passengers:

1) when seat belts or harnesses are to be fastened;

2) when and how oxygen equipment is to be used if the carriage of oxygen is required;

3) restrictions on smoking;

4) location and use of life jackets or equivalent individual flotation devices where their carriage is required; and

5) location and method of opening emergency exits; and

(e) If fuses are used, spare electrical fuses of appropriate ratings for replacement of those accessible in flight.

4.2.2.1 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 Kingdom of Thailand; 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.

4.2.3 A helicopter shall carry:

(a) the operations manual prescribed in Chapter 2 paragraph 2.2.3, or those parts of it that pertain to flight operations;

(b) the helicopter flight manual for the helicopter, or other documents containing performance data required for the application of Chapter 3 and any other information necessary for the operation of the helicopter within the terms of its certificate of airworthiness, unless these data are available in the operations manual;

(c) current and suitable charts to cover the route of the proposed flight and any route along which it is reasonable to expect that the flight may be diverted;

(d) aerodrome information relevant to operating route;

(e) minimum equipment list **(**MEL**)**;

(f) technical log book;

(g) certified true and copy of AOC by the CAAT;

(h) certificate of registration;

(i) certificate of airworthiness;

(j) a journey log book;

(k) a personnel license of each member of personnel;

(l) a communication radio license;

(m) noise certificate;

(n) weather information;

(o) mass and balance sheet;

(p) passenger manifest at departure and destination airport;

(q) cargo manifest (if applicable to the cargo flight and list of carry on cargo);

(r) operational flight plan;

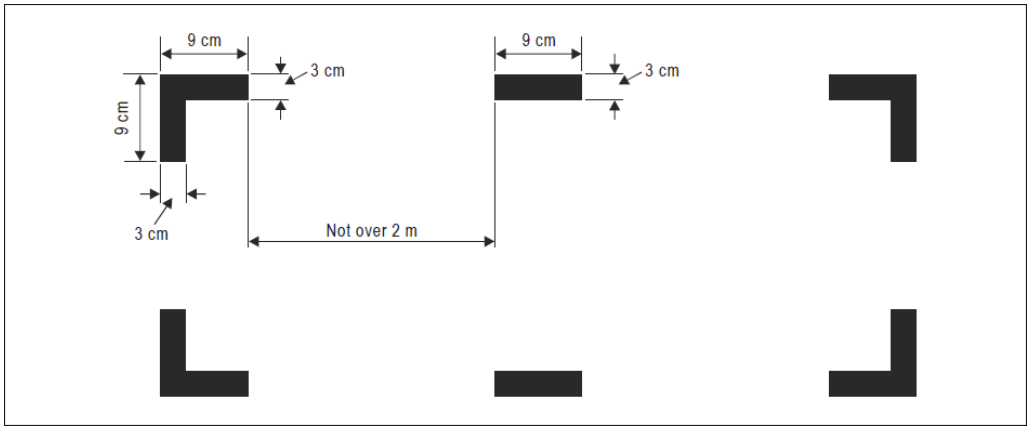
(s) ATC flight plan; and

(t) NOTAMs.

4.2.4 Marking of Break in Points

4.2.4.1 If applicable, if areas of the fuselage suitable for break**-** in by rescue crews in an emergency are marked on a helicopter, such areas shall be marked as shown below **(**see figure following**).** The color of the markings shall be red or yellow, and if necessary, they shall be outlined in white to contrast with the background**.**

4.2.4.2 If the corner markings are more than 2 m apart, intermediate lines 9 cm × 3 cm shall be inserted so that there is no more than 2 m between adjacent markings**.**



MARKING OF BREAK-IN POINTS (see 4.2.4.)

4.3 FLIGHT RECORDERS

4.3.1 Flight data recorder and aircraft data recording system (FDRs)

4.3.1.1 An operator of Thai registered helicopter shall ensure that:-

(a) 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 2016 shall be equipped with an FDR which shall record at least the first 48 parameters. listed in Table A-1 of Appendix A.

(b) All helicopters of a maximum certificated take-off mass of over 7 000 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 A-1 of Appendix A.

(c) 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 the CAAT on or after 1 January 2018 shall be equipped with:

- an FDR which shall record at least the first 48 parameters listed in Table A-1 of Appendix A; or

- a Class C AIR or AIRS which shall record at least the flight path and speed parameters displayed to the pilot(s), as defined in Table A-3 of Appendix A; or

- an ADRS which shall record the first 7 parameters listed in Table A-3 of Appendix A.

(d) All helicopters of a maximum certificated take-off mass of over 3 175 kg for which the application for type certificate is submitted to the CAAT on or after

1 January 2023 shall be equipped with an FDR capable of recording at least the first 53 parameters listed in Table A-1 of Appendix A.

Note 1: Parameters to be recorded are listed in Appendix A.

Note 2 : The "application for type certification was submitted to a Contracting State" refers to the date of application of the original "Type Certificate" for the helicopter type, not the date of certification of particular helicopter variants or derivative models

4.3.1.2 Where a Thai registered helicopter is equipped with a flight data recorder, the operator shall ensure that the flight data recorder does not use any of the following types of recording technology:

(a) engraving metal foil;

(b) frequency modulation (FM);

(c) photographic film; or

(d) magnetic tape.

4.3.1.3 All FDRs shall retain the information recorded during at least the last 10 hours of their operation.

4.3.2 Cockpit voice recorders (CVRs) and cockpit audio recording systems

4.3.2.1 An operator of Thai registered helicopter shall ensure that the helicopter is equipped with a cockpit voice recorder if: -

(a) the helicopter 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 ;

(b) the helicopter has a maximum certificated take-off mass of over 7 000 kg.

4.3.2.2 Where the helicopter mentioned in Paragraph 4.3.4.1 is not equipped with a flight data recorder, the operator shall ensure that the cockpit voice recorder also records the main rotor speed.

4.3.2.3 The operator of Thai registered helicopter shall ensue that the cockpit voice recorder equipped with the helicopter as mentioned in Paragraph 4.3.2.1 does not use any of the following types of recording technology:

(a) Magnetic tape:

(b) Wire.

4.3.2.4 All Thai registered helicopter 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.

4.3.3 Flight recorder - Data Link Recorder

4.3.3.1 In this paragraph, the Data Link Recorder means a crash-protected flight recorder that records data link communication message.

4.3.3.2 Where a Thai registered helicopter is required to carry a cockpit voice recorder as mentioned in paragraph 4.3.2, the operator shall ensure that the helicopter is equipped with the data link recorder: -

(a) all helicopters for which the individual certificate of airworthiness is first issued on or after 1 January 2016, which use any of the data link communications applications referred to in 1.5 1) (b) of Appendix A and are required to carry a CVR, shall record the data link communications messages on a crash-protected flight recorder;

(b) all helicopters for which the individual certificate of airworthiness was first issued before 1 January 2016, that are required to carry a CVR and are modified on or after 1 January 2016 to install and use any of the data link communications applications referred to in 1.5 1) (b) of Appendix A shall record the data link communications messages on a crash-protected flight recorder unless the installed data link communications equipment is compliant with a type design or aircraft modification first approved prior to 1 January 2016.

Note 1.— Refer to Table A-5 in Appendix A for examples of data link communication recording requirements.

Note 2.— A Class B AIR could be a means for recording data link communications applications messages to and from the helicopters where it is not practical or is prohibitively expensive to record those data link communications applications messages on FDR or CVR.

Note 3.— The "aircraft modifications" refer to modifications to install the data link communications equipment on the aircraft (e.g. structural, wiring).

4.3.3.3 The operator shall ensure that: -

(a) the minimum recording duration of the datalink recorder is at least equal to the minimum recording duration of the cockpit voice recorder; and

(b) the recordings of the data link recorder can be correlated to the recorded cockpit audio.

4.3.4 Flight recorders - general

4.3.4.1 Construction and installation

The operator of Thai registered helicopter shall ensure that every flight recorder required to be installed on the helicopter is constructed located and installed so as to provide maximum practical protection for the recordings in order that the recorded information may be preserved, recovered and transcribed. Flight recorders shall meet the prescribed crashworthiness and fire protection specifications.

4.3.4.2 Operation

(a) Flight recorders shall not be switched off during flight time.

(b) To preserve flight recorder records, flight recorders shall be de-activated upon completion of flight time following an accident or incident. The flight recorders shall not be re-activated before their disposition as determined by the investigation authority and in accordance with the ICAO standards. Flight recorder means flight data recorder and/or cockpit voice recorder, where applicable.

4.3.4.3 Continued serviceability

Operational checks and evaluations of recordings from the flight recorder systems shall be conducted to ensure the continued serviceability of the recorders.

Note.— Procedures for the inspections of the flight recorder systems are given in Appendix A.

4.3.4.4 Flight recorders electronic documentation

The documentation requirement concerning FDR parameters provided by operators to accident investigation authorities should be in electronic format and take account of industry specifications.

Note.— Industry specification for documentation concerning flight recorder parameters may be found in the ARINC 647A, Flight Recorder Electronic Documentation, or equivalent document.

4.4 INSTRUMENTS AND EQUIPMENT FOR FLIGHTS OPETATED UNDER VFR AND IFR - BY DAY AND NIGHT

4.4.1 All Thai registered helicopters when operating in accordance with VFR by day shall be equipped with:

(a) a magnetic compass;

(b) an accurate timepiece indicating the time in hours, minutes and seconds;

(c) a sensitive pressure altimeter;

(d) an airspeed indicator; and

(e) such additional instruments or equipment as may be prescribed by the CAAT**.**

4.4.2 All Thai registered helicopters when operating in accordance with VFR at night shall be equipped with:

(a) the equipment specified in 4.4.1;

(b) an attitude indicator **(** artificial horizon**)** for each required pilot and one additional attitude indicator;

(c) a slip indicator;

(d) a heading indicator **(**directional gyroscope**)**;

(e) a rate of climb and descent indicator;

(f) such additional instruments or equipment as may be prescribed by the CAAT;

and the following lights:

(g) the Navigation lights and anti-collision lights required by Regulation of Civil Aviation Board No. 94 on Rules of the air for aircraft in flight or operating on the movement area of a heliport;

(h) two landing lights or if only one landing light is available, at least 2 independent filaments shall be available;

(i) illumination for all instruments and equipment that are essential for the safe operation of the helicopter that are used by the flight crew;

(j) lights in all passenger compartments; and

(k) a flashlight for each crew member station.

4.4.2.1 One of the landing lights should be trainable, at least in the vertical plane.

4.4.3 All Thai registered helicopters when operating in accordance with IFR, or when the helicopter cannot be maintained in a desired attitude without reference to one or more flight instruments, shall be equipped with:

(a) a magnetic compass;

(b) an accurate timepiece indicating the time in hours, minutes and seconds;

(c) two sensitive pressure altimeters;

(d) an airspeed indicating system with means of preventing malfunctioning due to either condensation or icing;

(e) a slip indicator;

(f) an attitude indicator **(** artificial horizon**)** for each required pilot and one additional attitude indicator;

(g) a heading indicator **(**directional gyroscope**)**;

(h) a means of indicating whether the power supply to the gyroscope instrument is adequate in the flight;

(i) a means of indicating on the flight deck the outside air temperature;

(j) a rate of climb and descent indicator;

(k) 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;

(l) such additional instruments or equipment as may be prescribed by the CAAT; and

(m) if operated at night, the lights specified in 4**.**4.2 **(**g**)** to **(**k**)** and 4.4.2.1.

4.4.3.1 All Thai registered helicopters when operating in accordance with IFR shall be fitted with an emergency power supply, independent of the main electrical generating system, for the purpose of operating and illuminating, for a minimum period of 30 minutes, an attitude indicating instrument **(** artificial horizon**)**, clearly visible to the pilot**-**in**-**command**.** The emergency power supply shall be automatically operative after the total failure of the main electrical generating system and clear indication shall be given on the instrument panel that the attitude indicator**(**s**)** is being operated by emergency power**.**

4.4.4 Radio altimeter

For offshore operation helicopters shall be equipped with a radio altimeter that is capable of emitting an audio warning below a pre-set height and a visual warning at a height selectable by the pilot.

4.5 ALL HELICOPTERS ON FLIGHT OVER WATER

4.5.1 Means of Flotation

All Thai registered helicopters intended to be flown over water shall be fitted with a permanent or rapidly deployable means of flotation so as to ensure a safe ditching of the helicopter when**:**

(a) engaged in offshore operations, or other overwater operations as prescribed by the CAAT; or

(b) flying over water in a hostile environment at a distance from land corresponding to more than 10 minutes at normal cruise speed when operating in performance Class 1 or 2; or

(c) flying over water in a non- hostile environment at a distance from land specified by the appropriate authority of the responsible State when operating in performance Class 1; or

(d) flying over water beyond autorotational or safe forced landing distance from land when operating in performance Class 3**.**

4.5.2 Emergency Equipment

4.5.2.1 A Thai registered helicopters operating in performance Class 1 or 2 and operating in accordance with the provisions of paragraph 4**.**5**.**1 shall be equipped with**:**

(a) one life jacket, or equivalent individual flotation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided**.** For offshore operations the life jacket shall be worn constantly unless the occupant is wearing an integrated survival suit that includes the functionality of the life jacket;

(b) life**-**saving rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency, provided with such life**-** saving equipment including means of sustaining life as is appropriate to the flight to be undertaken;

(c) when two life rafts are fitted, each shall be able to carry all occupants in the overload state; and

(d) equipment for making the pyrotechnical distress signals described in the Regulation of Civil Aviation Board No. 94 on Rule of the Air.
*Note***.** *— The life raft overload state has a design safety margin of 1***.** *5 times the maximum capacity***.**

4.5.2.2 A Thai registered helicopter operating in performance Class 3 when operating beyond autorotational distance from land shall be equipped with one life jacket, or equivalent individual flotation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided**.**

4.5.2.3 For offshore operations, when operating beyond autorotational distance from land, the life jacket shall be worn unless the occupant is wearing an integrated survival suit that includes the functionality of the life jacket**.**

4.5.2.4 A Thai registered helicopter operating in performance Class 3 when operating beyond the distance specified in paragraph 4**.**5**.**2**.**2 shall be equipped as in paragraph 4**.**5**.**2**.**1

4.5.2.5 In the case of helicopters operating in performance Class 2 or 3, when taking off or landing at a heliport where, the take- off or approach path is so disposed over water that in the event of a mishap there would be likelihood of a ditching, the equipment required in paragraph 4.5.2.1 (a) shall be carried.

4.5.2.6 Each life jacket and equivalent individual flotation device, when carried in accordance with paragraph 4. 5, shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons.

4.5.3 All Helicopters on Flights Over Designated Sea Areas

4.5.3.1 A Thai registered helicopters, when operating over sea areas which have been designated by the State concerned as areas in which search and rescue would be especially difficult, shall be equipped with life- saving equipment (including means of sustaining life) as may be appropriate to the area overflown.

4.6 ALL HELICOPTER ON FLIGHT OVER DESIGNATED LAND AREAS

A Thai registered helicopter, when operated across land areas which have been designated by the State concerned as areas in which search and rescue would be especially difficult, shall be equipped with such signaling devices and life- saving equipment (including means of sustaining life) as may be appropriate to the area overflown.

4.7 EMERGEMCY LOCATOR TRASMITTER (ELT)

4.7.1 All Thai registered helicopters operating in performance Class 1, 2 and 3 shall be equipped with at least one automatic ELT and, when operating on flights over water as described in 4.5.1(a), with at least one automatic ELT and one ELT(s) in a raft or life jacket.

4.7.2 The ELT shall be able to transmit on 121.5 MHz and 406 MHz simultaneously.

4.7.3 ELT equipment carried to satisfy the requirements of 4.7.1 and 4.7.2 shall operate in accordance with the relevant provisions of Annex 10, Volume III.

Note.— The judicious choice of numbers of ELTs, their type and placement on aircraft and associated floatable life support systems will ensure the greatest chance of ELT activation in the event of an accident for aircraft operating over water or land, including areas especially difficult for search and rescue. Placement of transmitter units is a vital factor in ensuring optimal crash and fire protection. The placement of the control and switching devices (activation monitors) of automatic fixed ELTs and their associated operational procedures will also take into consideration the need for rapid detection of inadvertent activation and convenient manual switching by crew members.

4.7.4 Automatically deployable emergency locator transmitter (ELT(AD))

For offshore operation, the helicopter shall be equipped with an ELT)AD(that is capable

of transmitting simultaneously on 121,5 MHz and 406 MHz.

4.8 ALL HELICOPTER ON HIGH ALTITUDE FLIGHTS

4.8.1 A Thai registered helicopter intended to be operated at flight altitudes at which the atmospheric pressure is less than 700 hPa in personnel compartments shall be equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in paragraph 2.3.8.1.

4.8.2 A Thai registered helicopter intended to be operated at flight altitudes at which the atmospheric pressure is less than 700 hPa but which is provided with means of maintaining pressures greater than 700 hPa in personnel compartments shall be provided with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in paragraph 2.3.8.2.

4.8.3 A Thai registered helicopter intended to be operated at flight altitudes at which the atmospheric pressure is less than 376 hPa which cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to 620 hPa, shall be provided with automatically deployable oxygen equipment to satisfy the requirements of paragraph 2.3.8.2. The total number of oxygen dispensing units shall exceed the number of passenger and cabin crew seats by at least 10 per cent.

4.9 ALL HELICOPTER IN ICING CONDITIONS

All Thai registered helicopters shall be equipped with suitable anti-icing and/or de-icing devices when operated in circumstances in which icing conditions are reported to exist or are expected to be encountered.

4.10 HELICOPTER WHEN CARRYING PASSENGER — SIGIFICANT-WEATHER DETECTION

A Thai registered helicopter when carrying passengers shall be equipped with operative weather radar or other significant-weather detection equipment whenever such helicopters are being operated in areas where thunderstorms or other potentially hazardous weather conditions, regarded as detectable, may be expected to exist along the route either at night or under instrument meteorological conditions.

4.11 ALL HELICOPTER REQUIRED TO COMPLY WITH THE NOISE CERTIFICATION STANDARDS IN ANNEX 16, VOLUME I

All Thai registered helicopters shall carry a document attesting noise certification. When the document is issued in a language other than English, it shall also include an English translation.

4.12 HELICOPTERS CARRYING PASSENGERS—CABIN CREW SEATS

4.12.1 All Thai registered helicopters shall be equipped with a forward or rearward facing (within 15 degrees of the longitudinal axis of the helicopter) seat, fitted with a safety harness for the use of each cabin crew member required to satisfy the intent of 10.1 in respect of emergency evacuation.

Note 1.— In accordance with the provisions of 4.2.2 (c) 1), a seat and seat belt shall be provided for the use of each additional cabin crew member.

Note 2.— Safety harness includes shoulder straps and a seat belt which may be used independently.

4.12.2 Cabin crew seats shall be located near floor level and another emergency exits for emergency evacuation**.**

4.13 HELICOPTER REQUIRED TO BE EQUIPPED WITH A PRESSURE-ALTITUDE REPORTING TRANSPONDER

Except as may be otherwise authorized by the CAAT, all helicopters shall be equipped with a pressure-altitude reporting transponder which operates in accordance with the provisions of 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.

4.14 MICROPHONES

All flight crew members required to be on flight deck duty shall communicate through boom or throat microphones**.**

4.15 VIBRATION HEALTH MONITORING (VHM)

4.15.1 The following helicopters conducting Commercial Air Transport offshore operations in a hostile environment shall be fitted with a VHM system capable of monitoring the status of critical rotor and rotor drive systems by 1 January 2019**:**

(a) All multi engine helicopters over 3 175 kg MTOW, or certificated for operations with at least two crew, first issued with an individual Certificate of Airworthiness **(**C of A**)** after 31 December 2016;

(b) All helicopters with a maximum operational passenger seating configuration **(**MOPSC**)** of more than 9 and first issued with an individual C of A before 1 January 2017;

(c) All helicopters first issued with an individual C of A after 31 December 2018**.**

4.15.2 The operator of Thai registered helicopter shall have a system to**:**

(a) collect the data including system generated alerts;

(b) analyze and determine component serviceability; and

(c) respond to detected incipient failures**.**

4.16 HELICOPTERS 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)

4.16.1 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 CAAT**.**

Note 1.— 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.— 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.

4.16.2 To obtain an operational approval from the CAAT, the operator shall provide evidence that**:**

(a) the equipment meets the appropriate airworthiness certification requirements and is acceptable to the CAAT;

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

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

4.17 ELECTRONIC FLGHT BAGS (EFBs)

Note.— Guidance on EFB equipment, functions and specific approval is contained in the Manual on Electronic Flight Bags (EFBs) (Doc 10020) and CAAT EFB guidance material.

4.17.1 Where portable EFBs are used on board a helicopter, the operator shall ensure that they do not affect the performance of the helicopter systems, equipment or the ability to operate the helicopter**.**

4.17.2 EFB functions

(a) 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.

Note.— Guidance on safety risk assessments is contained in the Safety Management Manual (SMM) (Doc 9859).

(b) The operational use of EFB functions to be used for the safe operation of helicopters shall be issued with specific approval by the CAAT.

4.17.3 EFB specific approval

The operator shall ensure that:

(a) the EFB equipment and its associated installation hardware, including interaction with helicopter systems if applicable, meet the appropriate airworthiness certification requirements;

(b) they have assessed and documented the safety risks associated with the operations supported by the EFB function(s);

(c) they have established requirements for redundancy of the information

(if appropriate) contained and displayed by the EFB function(s);

(d) they have established and documented procedures for the management of the EFB function(s) including any databases it may use; and

(e) they have established and documented the procedures for the use of, and training requirements for the EFB function(s).

Note.— Guidance on safety risk assessments is contained in the Safety Management Manual (SMM) (Doc 9859).

4.18 HELICOPTER TERRAIN AWARENESS WARNING SYSTEM (HTAWS)

A Thai registered helicopter with a maximum certificated take-off mass of more than 3 175 kg or a MOPSC of more than 9 and first issued with an individual C of A after 31 December 2018 shall be equipped with an HTAWS acceptable to the CAAT such as FAA TSO-C194, EASA TSO-C194 or coming with improved features.

4.19 PUBLIC ADDRESS (PA) SYSTEM

The operator of Thai registered helicopter shall comply with the Public Address (PA) system in helicopters used for CAT:

(a) Helicopters with a maximum operational passenger seat configuration (MOPSC) of more than 9 shall be equipped with a PA system.

(b) Helicopters with an MOPSC of 9 or less need not be equipped with a PA system if the operator can demonstrate that the pilot's voice is understandable at all passengers' seats in flight.

CHAPTER 5 HELICOPTER COMMUNICATION, NAVIGATION AND SURVEILLANCE EQUIPMENT

5.1 COMMUNICATION EQUIPMENT

5.1.1 A Thai registered helicopter shall be provided with radio communication equipment capable of**:**

(a) Conducting two**-**way communication for heliport control purposes;

(b) Receiving meteorological information at any time during flight; and

(c) Conducting two**-** way communication at any time during flight with at least one aeronautical station and with such other aeronautical stations and on such frequencies as may be prescribed by the appropriate authority**.**

Note.— The requirements of 5.1.1 are considered fulfilled if the ability to conduct the communications specified therein is established during radio propagation conditions which are normal for the route.

5.1.2 The radio communication equipment required in accordance with paragraph 5.1.1 shall provide for communications on the aeronautical emergency frequency 121**.**5 MHz**.**

5.1.3 For flights in defined portions of airspace or on routes where an RCP type has been prescribed, a helicopter shall, in addition to the requirements specified in paragraph 5**.**1**.**1 the Manual on Required Communications Performance **(**RCP**) (**Doc 9869**)**.

5.1.4 For operations where communication equipment is required to meet an RCP specification for performance**-** based communication **(**PBC**)**, a helicopter shall, in addition to the requirements specified in paragraph 5**.**1**.**1**:**

(a) be provided with communication equipment which will enable it to operate in accordance with the prescribed RCP specification**(**s**)**;

(b) have information relevant to the helicopter RCP specification capabilities listed in the flight manual or other helicopter documentation approved by the CAAT; and

(c) have information relevant to the helicopter RCP specification capabilities included in the MEL**.**

*Note. — Information on the performance**-** based communication and surveillance **(** PBCS**)** concept and guidance material on its implementation are contained in Guidance Material for PBCS Operational Approval**).***

5.1.5 For operations where an RCP specification for PBC has been prescribed, the operator shall establish and document**:**

(a) normal and abnormal procedures, including contingency procedures;

(b) flight crew qualification and proficiency requirements, in accordance with appropriate RCP specifications;

(c) a training programme for relevant personnel consistent with the intended operations; and

(d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RCP specifications.

5.1.6 The operator Thai registered helicopter in respect of helicopters in paragraph 5**.**1**.**3 shall ensure provisions exist for**:**

(a) providing reports of observed communication performance issues by monitoring programmes established in accordance with Annex 11, Chapter 3, 3.3.5.2; and

(b) Taking immediate corrective action and reporting individual helicopters, helicopter types or operators, not complying with the RCP specification**(**s**).**

5.2 NAVIGATION EQUIPMENT

5.2.1 A Thai registered helicopter shall be provided with navigation equipment which will enable it to proceed**:**

(a) In accordance with its operational flight plan; and

(b) In accordance with the requirements of air traffic services;

except when, if not so precluded by the appropriate authority, navigation for flights under VFR is accomplished by visual reference to landmarks**.**

5.2.2 For operations where a navigation specification for performance**-** based navigation **(** PBN**)** has been prescribed, a helicopter shall, in addition to the requirements specified in paragraph 5**.**2**.**1**:**

(a) be provided with navigation equipment which will enable it to operate in accordance with the prescribed navigation specification**(**s**)**; and

(b) have information relevant to the helicopter navigation specification capabilities listed in the flight manual or other helicopter documentation approved by the State of Design or the CAAT; and

(c) have information relevant to the helicopter navigation specification capabilities included in the MEL**.**

Note.— Guidance on helicopter documentation is contained in CAAT Performanced-Based Navigation (PBN) guidance material and the Performance-based Navigation (PBN) Manual (Doc 9613).

5.2.3 The operator of Thai registered helicopter shall, for operations where a navigation specification for PBN has been prescribed, shall establish and document**:**

(a) normal and abnormal procedures, including contingency procedures;

(b) flight crew qualification and proficiency requirements, in accordance with the appropriate navigation specifications;

(c) a training programme for relevant personnel consistent with the intended operations; and

(d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with 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 (Doc 9997) and CAAT Performanced-Based Navigation (PBN) guidance material.

Note 2.— Electronic navigation data management is an integral part of normal and abnormal procedures.

5.2.4 When satisfied, the CAAT shall issue a specific approval for operations based on PBN authorization required **(**AR**)** navigation specifications and RNP 0**.**3 Specifications**.**

Note.— Guidance on specific approvals for PBN authorization required (AR) navigation specifications is contained in the Performance-based Navigation (PBN) Operational Approval Manual (Doc 9997) and CAAT Performanced-Based Navigation (PBN) guidance material.

5.2.5 The Thai registered helicopter shall be sufficiently provided with navigation equipment to ensure that, in the event of the failure of one item of equipment at any stage of the flight, the remaining equipment will enable the helicopter to navigate in accordance with paragraph 5**.** 2**.** 1 and, where applicable, paragraph 5**.**2**.**2**.**

5.2.6 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**.**

5.3 SURVEILLANCE EQUIPMENT

5.3.1 A Thai registered helicopter shall be provided with surveillance equipment which will enable it to operate in accordance with the requirements of air traffic services.

5.3.2 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 paragraph 5.3.1:

(a) be provided with surveillance equipment which will enable it to operate in accordance with the prescribed RSP specification(s);

(b) have information relevant to the helicopter RSP specification capabilities listed in the flight manual or other helicopter documentation approved by the State of Design or State of Registry; and

(c) have information relevant to the helicopter RSP specification capabilities included in the MEL.

Note 1. — Information on surveillance equipment is contained in the Aeronautical Surveillance Manual *(Doc 9924).*

Note 2. — Information on RSP specifications for performance-based surveillance is contained in Guidance Material for PBCS Operational Approval.

5.3.3 For operations where an RSP specification for PBS has been prescribed, the operator shall establish and document:

(a) normal and abnormal procedures, including contingency procedures;

(b) flight crew qualification and proficiency requirements, in accordance with appropriate RSP specifications;

(c) a training programme for relevant personnel consistent with the intended operations; and

(d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with appropriate RSP specifications.

5.3.4 The operator Thai registered helicopter in respect of helicopters in paragraph 5.3.2 shall ensure provisions exist for:

(a) providing reports of observed surveillance performance; and

(b) taking immediate corrective action for individual helicopter, helicopter types or operators, identified in such reports as not complying with the RSP specification(s).

5.4 EQUIPMENT INSTALLATION

The equipment installation shall be such that the failure of any single unit required for communication, navigation or surveillance purposes or any combination thereof will not result in the failure of another unit required for communication, navigation or surveillance purposes**.**

5.5 ELECTRONIC NAVIGATION DATA MANAGEMENT

5.5.1 The operator of Thai registered helicopter shall not use electronic navigation data products that have been processed for application in the air and on the ground, unless the CAAT has approved the operator's procedures for ensuring that the process applied and the products delivered have met acceptable standards of integrity and that the products are compatible with the intended function of the existing equipment**.** The operator shall continue to monitor both the process and products**.**

Note. — Guidance relating to the processes that data suppliers may follow is contained in RTCA DO200A/ EUROCAE ED- 76 and RTCA DO-201A/EUROCAE ED-77.

5.5.2 The operator of Thai registered helicopter shall implement procedures that ensure the timely distribution and insertion of current and unaltered electronic navigation data to all necessary aircraft**.**

CHAPTER 6 HELICOPTER CONTINUING AIRWORTHINESS

6.1 OPERATOR'S CONTINUING AIRWORTHINESS RESPONSIBILITIES

6.1.1 The operator of Thai registered helicopter shall ensure that the maintenance of its helicopters is performed in accordance with AOCR Chapter 8 and Appendix W.

6.1.2 Operators shall ensure that, in accordance with procedures acceptable to the CAAT:

(a) Each helicopter they operate is maintained in an airworthy condition;

(b) The operational and emergency equipment necessary for the intended flight is serviceable; and

(c) The certificate of airworthiness of the helicopter they operate remains valid.

6.1.3 An operator of Thai registered helicopter shall not operate a helicopter unless maintenance on the helicopter, including any associated engine, rotor and part, is carried out:

(a) by an organization approved by the CAAT or is approved by another Contracting State and is accepted by the CAAT; or

(b) by a person or organization in accordance with procedures that are approved in the General Maintenance Manual which limit up to line maintenance as defined in AOCR Chapter 8.

and there is a maintenance release in relation to the maintenance carried out.

6.1.4 The person under 6.1.3 b) signing the maintenance release shall be licensed in accordance with the Regulation on Civil Aviation Board No 77.

6.1.5 An operator of Thai registered helicopter shall employ a person or group of persons to ensure that all maintenance is carried out in accordance with the General Maintenance Manual.

6.1.6 The operator shall ensure that the maintenance of its helicopters is performed in accordance with the maintenance programme approved by the CAAT.

6.2 GENERAL MAINTENANCE MANUAL

6.2.1 The operator of Thai registered helicopter shall develop a General Maintenance Manual (GMM) to describe the procedures necessary to ensure all scheduled and unscheduled maintenance is performed on the operator's aircraft on time and in a controlled and satisfactory manner. The GMM shall describe the maintenance arrangements to support the operator's operation. The design of the GMM should observe Human Factors principles**.**

6.2.2 The operator of Thai registered helicopter shall ensure that the GMM is amended as necessary to keep the information contained therein up-to-date**.**

6.2.3 Copies of all amendments to the operator' s General Maintenance Manual shall be furnished promptly to all organizations or persons to whom the manual has been issued**.**

6.2.4 The operator of Thai registered helicopter shall provide the CAAT with a copy of the operator's maintenance control manual, together with all amendments and/or revisions to it and shall incorporate in it such mandatory material as the CAAT may require.

6.3 MAINTENANCE PROGRAMME

6.3.1 The operator of Thai registered helicopter shall provide, for the use and guidance of maintenance and operational personnel concerned, a maintenance programme, approved by the CAAT, containing the information required by paragraph 9**.** 3**.** The design and application of the operator' s maintenance programme shall observe Human Factors principles**.**

6.3.2 Copies of all amendments to the maintenance programme shall be furnished promptly to all organizations or persons to whom the maintenance programme has been issued**.** If there are revisions, the air operator shall furnish the details or revisions to the CAAT for approval before being issued for use**.**

6.4 CONTINUING AIRWORTHINESS RECORDS

6.4.1 An operator of Thai registered helicopter shall ensure that the following records are kept for the periods mentioned in paragraph 6**.**4**.**2**:**

(a) The total time in service **(**hours, calendar time and cycles, as appropriate**)** of the helicopter and all life**-**limited components**.**

(b) The status of compliance with all mandatory continuing airworthiness information**.**

(c) Appropriate details of modifications and repairs to the helicopter and its major components**.**

(d) The time in service (hour**s**, calendar time and cycles, as appropriate**)** since last overhaul of the helicopter or its components subject to a mandatory overhaul life**.**;

(e) The status of the helicopter's compliance with the maintenance programme**.**; and

(f) The detailed maintenance records to show that all requirements for a maintenance release have been met**.**

6.4.2 The records in paragraph 6.4.1 **(**a**)** to **(**e**)** shall be kept for a minimum period of 90 days after the unit to which they refer has been permanently withdrawn from service, and the records in paragraph 6.4.1 **(f)** for a minimum period of one year after the signing of the maintenance release**.**

6.4.3 In the event of a temporary change of operator, the records shall be made available to the new operator**.** In the event of any permanent change of operator, the records shall be transferred to the new operator**.**

6.4.4 As of 5 November 2020, The Thai registered helicopter shall ensure that records kept and transferred in accordance with paragraph 6.4 shall be maintained in a form and format that ensures readability, security and integrity of the records at all times.

6.5 CONTINUING AIRWORTHINESS INFORMATION

6.5.1 The operator of Thai registered helicopter shall submit a written report on the occurrences of faults, malfunctions, defects or other occurrences that cause or might cause adverse effects on the continuing airworthiness of the aircraft concerning but not limited to the occurrence or detection of each failure, malfunction, or defect contained in The Civil Aviation Authority of Thailand Requirement No.22 on "Occurrence Reporting in Civil Aviation".

6.5.2 In addition to the requirements contained in para 6.5.1, The operator of Thai registered helicopter over 3 175 kg maximum certificated take-off mass, shall monitor and assess maintenance and operational experience with respect to continuing airworthiness and submit a written report on the occurrences of faults, malfunctions, defects or other occurrences as detailed in para 6.5.1 to the following persons:

(a) the aircraft type certificate holder; or

(b) in the case where information on faults, malfunctions, defects and other occurrences relates to an engine or propeller, the aircraft type certificate holder and the organisation responsible for the engine or propeller design; or

(c) in the case of an occurrence associated with a modification, the organization responsible for the design of the modification.

6.5.3 Such reports as detailed in para 6.5.1 and 6.5.2 may be transmitted by any method i.e. electronically (email: safetyreport@caat.or.th), by post or by facsimile. Each report should contain at least the following information in accordance with The Civil Aviation Authority of Thailand Requirement No.22 on "Occurrence Reporting in Civil Aviation".

6.5.4 The operator of Thai registered helicopter over 3175 kg MTOW shall obtain and assess continuing airworthiness information and recommendations available from the organization responsible for the type design and shall implement resulting actions considered necessary in accordance with a procedure acceptable to the CAAT.

Note.— Guidance on interpretation of "the organization responsible for the type design" is contained in the Airworthiness Manual (Doc 9760).

6.6 MODIFICATIONS AND REPAIRS

All modifications and repairs shall comply with the requirements contained in Announcement of the CAAT on Air Operator Certificate Requirements (AOCR), Chaper 8, and Annoucement of the CAAT on Maintenance, Preventive Maintenance, Rebuilding and Alteration. Procedures shall be established to ensure that the substantiating data supporting compliance with the associated regulation are retained.

6.7 MAINTENANCE RELEASE

6.7.1 A maintenance release shall be completed and signed to certify that the maintenance work performed has been completed satisfactorily and in accordance with approved data and the procedures described in the general maintenance manual which limit up to line maintenance as defined in AOCR Chapter 8 or Repair Station and Quality Control Manual (RSQM).

6.7.2 A maintenance release shall contain a certification including**:**

(a) Basic details of the maintenance carried out including detailed reference of the approved data used;

(b) The date such maintenance was completed;

(c) When applicable, the identity of the approved maintenance organization; and

(d) The identity of the person or persons signing the release**.**

6.8 RECORDS

6.8.1 The operator of Thai registered helicopter shall ensure that the following records are kept**:**

(a) in respect of the entire helicopter**:** the total time in service;

(b) in respect of the major components of the helicopter**:**

1) the total time in service;

2) the date of the last overhaul;

3) the date of the last inspection;

(c) in respect of those instruments and equipment, the serviceability and operating life of which are determined by their time in service**:**

1) such records of the time in service as are necessary to determine their serviceability or to compute their operating life;

2) the date of the last inspection**.**

6.8.2 These records shall be kept for a period of 90 days after the end of the operating life of the unit to which they refer.

CHAPTER 7 HELICOPTER FLIGHT CREW

7.1 COMPOSITION OF THE FLIGHT CREW

7.1.1 The number and composition of the flight crew shall not be less than that specified in the operations manual. The flight crews shall include flight crew members in addition to the minimum numbers specified in the Rotorcraft flight manual or other documents associated with the certificate of airworthiness, when necessitated by considerations related to the type of helicopter used, the type of operation involved and the duration of flight between points where flight crews are changed.

7.1.2 The flight crew shall include at least one member authorized by the CAAT to operate the type of radio transmitting equipment to be used.

7.2 FLIGHT CREW MEMBER EMERGENCY DUTIES

An operator of Thai registered helicopter shall, for each type of helicopter, assign to all flight crew members the necessary functions they are to perform in an emergency or in a situation requiring emergency evacuation. Annual training in accomplishing these functions shall be contained in the operator's training programme and shall include instruction in the use of all emergency and life- saving equipment required to be carried and drills in the emergency evacuation of the helicopter.

7.3 FLIGHT CREW MEMBER TRAINING PROGRAMMES

7.3.1 The operator of Thai registered helicopter shall establish and maintain training programme in accordance with Appendix C and approved by the CAAT, 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 CAAT;

(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) if applicable, 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 training on a recurrent basis acceptable to the CAAT. The recurrent training shall include an examination to assess competence.

7.3.2 The requirement for recurrent flight training in a particular type of helicopter shall be considered fulfilled by:

(a) The use, to the extent deemed feasible by the CAAT, of flight simulation training devices approved by CAAT for that purpose; or

(b) The completion within the appropriate period of the proficiency check required by paragraph 7.4.4 in that type of helicopter.

7.4 QUALIFICATIONS

7.4.1 Recent experience — pilot-in-command and co-pilot

7.4.1.1 An operator of Thai registered helicopter shall not assign a pilot- in- command or a co- pilot to operate at the flight controls of a type or variant of a type of a helicopter during take-off and landing unless that pilot has operated the flight controls during at least three take- offs and landings within the preceding 90 days on the same type of helicopter or in a flight simulator approved for the purpose.

7.4.1.2 When a pilot- in- command or a co- pilot is flying several variants of the same type of helicopter or different types of helicopter with similar characteristics in terms of operating procedures, systems and handling, the operator shall seek agreement with CAAT under which conditions the requirements of paragraph 7.4.1.1 for each variant or each type of helicopter can be combined.

7.4.2 Pilot-in-command operational qualification

7.4.2.1 An operator of Thai registered helicopter shall not utilize a pilot as pilot- in-command of a helicopter on an operation for which that pilot is not currently qualified until such pilot has complied with paragraph 7.4.2.2 and 7.4.2.3.

7.4.2.2 Each such pilot shall demonstrate to the operator an adequate knowledge of:

(a) The operation to be flown. This shall include knowledge of:

1) The terrain and minimum safe altitudes;

2) The seasonal meteorological conditions;

3) The meteorological, communication and air traffic facilities, services and procedures;

4) The search and rescue procedures; and

5) The navigation facilities and procedures associated with the route or area in which the flight is to take place; and

(b) 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**.**

Note.— That portion of the demonstration relating to arrival, departure, holding and instrument approach procedures may be accomplished in an appropriate training device which is adequate for this purpose.

7.4.2.3 A pilot- in- command shall have made a flight, representative of the operation with which the pilot is to be engaged which must 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**.**

7.4.2.4 The operator of Thai registered helicopter shall maintain a record, sufficient to satisfy the CAAT of the qualification of the pilot and of the manner in which such qualification has been achieved**.**

7.4.2.5 An operator of Thai registered helicopter shall not continue to utilize a pilot as a pilot-in-command on an operation 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 must requalify in accordance with paragraph 7.4.2.2. and 7.4.2.3.

7.4.2.6 An operator of Thai registered helicopter shall not assign a pilot to fly more than two types of helicopter**.**

7.4.2.7 An operator of Thai registered helicopter shall not assign a pilot to fly more than one type of helicopter in one period **(**single duty period**).**

7.4.3 Operator proficiency checks

7.4.3.1 An operator of Thai registered helicopter shall ensure that piloting technique and the ability to execute emergency procedures is checked in such a way as to demonstrate the pilot's competence on each type or variant of a type of helicopter**.** Where the operation may be conducted under IFR, an operator shall ensure that the pilot's competence to comply with such rules is demonstrated to either a check pilot of the operator or to a representative of the CAAT**.**

7.4.3.2 The validity period of the operator proficiency check shall be six calendar months**.** The validity periods shall be counted form the end of date when the check was taken. The proficiency check shall be undertaken before commencing commercial air transport operations**.**

7.4.3.3 When the check required above are undertaken within the last three months of the validity period, the new validity period shall be counted form the original expiry date. However, the interval of any two such checks shall be at least four months.

7.4.3.4 When the operator schedules flight crew on several variants of the same type of helicopter or different types of helicopters with similar characteristics in terms of operating procedures, systems and handling, the CAAT shall decide under which conditions the requirements of paragraph 7.4.3.1 for each variant or each type of helicopter can be combined**.**

7.5 FLIGHT CREW EQUIPMENT

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

7.6 FLIGHT TIME, FLIGHT DUTY PERIODS AND REST PERIODS

The operator of Thai registered helicopter shall comply with the flight time, flight duty period, duty period and rest period limitations for flight crew members in accordance with the Announcement of Civil Aviation Authority of Thailand on Flight Time and Flight Duty Period Limitation requirements**.**

CHAPTER 8 FLIGHT OPERATIONS OFFICER/FLIGHT DISPATCHER

The operator of Thai registered helicopter shall demonstrate appropriate procedures concerning flight operations officer/ flight dispatcher as follows;

8.1 A Flight operations officer/ flight dispatcher, employed in conjunction with an approved method of control and supervision of flight operations shall be licensed in accordance with the provisions of the CAAT**.**

8.2 In accepting proof of qualifications other than the option of holding of a flight operations officer/ flight dispatcher license, such persons must have at least the equivalent of knowledge as flight operations officer/flight dispatcher, as defined in the regulations of the Civil Aviation Board, including**:** pilot license holders**.**

8.3 A flight operations officer/ flight dispatcher shall not be assigned to duty unless that person has**:**

(a) Satisfactorily completed an operator**-** specific training course that addresses all the specific components of its approved method of control and supervision of flight operations specified in Chapter 2 paragraph 2**.** 2**.** 1**.** 3 of this requirement and AOCR Appendix L**.**

(b) Made, within the preceding 12 months, at least a one**-**way qualification flight in a helicopter over any area for which that person is authorized to exercise flight supervision**.** The flight shall include landings at as many heliports as practicable**.** For the purpose of the qualification flight, the flight operations officer/ flight dispatcher must be able to monitor the flight crew intercommunication system and radio communications and be able to observe the actions of the flight crew**.**

(c) Demonstrated to the operator a knowledge of**:**

1) The contents of the operations manual;

2) The radio equipment in the helicopters used; and

3) The navigation equipment in the helicopters used;

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

1) The seasonal meteorological conditions and the sources of meteorological;

2) The effects of meteorological conditions on radio reception in the helicopters;

3) The peculiarities and limitations of each navigation system which is used by the operation; and

4) The helicopter loading instructions;

(e) Satisfied the operator as to knowledge and skills related to human performance as they apply to dispatch duties; and

(f) Demonstrated to the operator the ability to perform the duties specified in chapter 2 paragraph 2.6.

A flight operations officer/ flight dispatcher assigned to duty shall maintain complete familiarization with all features of the operations which are pertinent to such duties, including knowledge and skills related to human performance.

CHAPTER 9 MANUALS, LOGS AND RECORDS

9.1 FLIGHT MANUAL

The flight manual shall be updated by implementing changes made mandatory by the CAAT.

9.2 GENERAL MAINENANCE MANUAL

The operator's maintenance control manual provided in accordance with Chapter 6 paragraph 6.2, which may be issued in separate parts, shall contain the following information:

(a) a description of the procedures required by Chapter 6 paragraph 6.1.2 including, when applicable:

1) a description of the administrative arrangements between the operator and the approved maintenance organization;

2) a description of the maintenance procedures and the procedures for completing and signing a maintenance release as required by Chapter 6 paragraph 6.1.3(b);

(b) names and duties of the person or persons required by Chapter 6 paragraph 6.1.5;

(c) a reference to the maintenance programme required by Chapter 6 paragraph 6.3.1;

(d) a description of the methods used for the completion and retention of the operator's maintenance records required by Chapter 6 paragraph 6.4;

(e) a description of the procedures for monitoring, assessing and reporting maintenance and operational experience required by Chapter 6 paragraph 6.5.2;

(f) a description of the procedures for complying with the service information reporting requirements as required by Chapter 6 paragraph 6.5.2;

(g) a description of procedures for assessing continuing airworthiness information and implementing any resulting actions, as required by Chapter 6 paragraph 6.5.4;

(h) a description of the procedures for implementing action resulting from mandatory continuing airworthiness information;

(i) a description of establishing and maintaining a system of analysis and continued monitoring of the performance and efficiency of the maintenance

programme, in order to correct any deficiency in that programme;

(j) a description of helicopter types and models to which the manual applies;

(k) a description of procedures for ensuring that unserviceabilities affecting airworthiness are recorded and rectified;

(l) a description of the procedures for advising the State of Registry of significant in-service occurrences;

(m) a description of procedures to control the leasing of aircraft and related aeronautical products; and

(n) a description of the maintenance control manual amendment procedures.

9.3 MAINTENANCE PROGRAMME

9.3.1 A maintenance programme for each helicopter as required by Chapter 6, paragraph 6.3 shall contain the following information**:**

(a) Maintenance tasks and the intervals at which these are to be performed, taking into account the anticipated utilization of the helicopter;

(b) When applicable, a continuing structural integrity programme;

(c) Procedures for changing or deviating from **(**a**)** and **(**b**)** above; and

(d) When applicable, condition monitoring and reliability programme descriptions for helicopter systems, components, power transmissions, rotors and engines**.**

9.3.2 Maintenance tasks and intervals that have been specified as mandatory in approval of the type design shall be identified as such**.**

9.3.3 The maintenance programme shall be based on maintenance programme information made available by the State of Design or by the organization responsible for the type design, and any additional applicable experience**.**

9.4 JOURNEY LOG BOOK

9.4.1 The helicopter journey log book should contain the following item**:**

(a) Helicopter nationality and registration**.**

(b) Date**.**

(c) Names of crew members**.**

(d) Duty assignments of crew members**.**

(e) Place of departure

(f) Place of arrival**.**

(g) Time of departure**.**

(h) Time of arrival**.**

(i) Hours of flight**.**

(j) Nature of flight **(**private, scheduled or non-scheduled**).**

(k) Incidents, observations, if any**.**

(l) Signature of person in charge**.**

9.4.2 Entries in the journey log book should be made currently and in ink or indelible pen**.**

9.4.3 Completed journey log books should be retained to provide a continuous record of the last six months' operations**.**

9.5 RECORDS OF EMERGENCY AND SURVIVAL EQUIOMENT CARRIED

An operators of Thai registered helicopter shall at all times have available for immediate communication to rescue coordination centres, lists containing information on the emergency and survival equipment carried on board any of their helicopters engaged in international air navigation**.** The information shall include, as applicable, the number, color and type of life rafts and pyrotechnics, details of emergency medical supplies, water supplies and the type and frequencies of the emergency portable radio equipment**.**

9.6 FLIGHT RECORDER RECORDS

An operator of Thai registered helicopter shall ensure, to the extent possible, in the event the helicopter becomes involved in an accident or incident, the preservation of all related flight recorder records, and if necessary, the associated flight recorders, and their retention in safe custody pending their disposition as determined by the Air Accident Investigation Regulations of Thailand**.**

9.7 FLIGHT DATA MONITORING (FDM) SYSTEM

For offshore operations:

(a) When conducting CAT operations with a helicopter equipped with a flight data recorder, the operator shall establish and maintain a FDM system, as part of its integrated management system, by 1 January 2019.

(b) The FDM system shall be non-punitive and contain adequate safeguards to protect the source(s) of the data.

9.8 AIRCRAFT TRACKING SYSTEM

An operator of Thai registered helicopter shall establish and maintain a monitored aircraft tracking system for offshore operations in a hostile environment from the time the helicopter departs until it arrives at its final destination.

CHAPTER 10 CABIN CREW

10.1 ASSIGNMENT OF EMERGENCY DUTIES

The operator of Thai registered helicopter shall establish, to the satisfaction of the CAAT, the minimum number of cabin crew required for each type of helicopter, based on seating capacity or the number of passengers carried, in order to effect a safe 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**.**

10.1.1 In any case at least one cabin crew member shall be assigned for the operation of helicopters with a maximum operational passenger seating configuration (MOPSC) of more than 19 as identified in the operations manual when carrying one or more passenger**(**s**).**

10.1.2 An operator of Thai registered helicopter shall ensure that all cabin crew on helicopter wear uniform, except in circumstances where the crew wear immersion suits**.**

10.2 PROTECTION OF CABIN CREW DURING FLIGHT

Each cabin crew member shall be seated with seat belt or, when provided, safety harness fastened during take- off and landing and whenever the pilot-in-command so directs**.**

10.3 TRAINING

An operator of Thai registered helicopter shall establish and maintain a training programme, approved by the CAAT, to be completed by all persons before being assigned as a cabin crew member**.** Cabin crew members shall complete a recurrent training programme annually**.** The training programmes are contained in AOCR Chapter 6.

CHAPTER 11 SECURITY

11.1 HELICOPTER SEARCH PROCEDURE CHECKLIST

The operator of Thai registered helicopter shall ensure that there is on board a checklist of the procedures to be followed in searching for a bomb in case of suspected sabotage. The checklist shall be supported by guidance on the course of action to be taken should a bomb or suspicious object be found.

11.2 TRAINING PROGRAMMES

11.2.1 An operator of Thai registered helicopter shall establish and maintain a training programme approved by the CAAT which enables crew members to act in the most appropriate manner to minimize the consequences of acts of unlawful interference.

11.2.2 An operator of Thai registered helicopter shall also establish and maintain a training programme to acquaint appropriate employees with preventive measures and techniques in relation to passengers, baggage, cargo, mail, equipment, stores and supplies intended for carriage on a helicopter so that they contribute to the prevention of acts of sabotage or other forms of unlawful interference.

11.3 REPORTING ACTS OF UNLAWFULINTERFERENCE

An act of unlawful interference, the pilot – in - command shall submit, without delay, a report of such an act directly to the CAAT and to any other designated local authority.

11.4 SECURITY MANUAL

The operator of Thai registered helicopter shall provide a security manual in accordance with the Regulation of Civil Aviation Board No**.** 85, to its staff**.** The security manual shall be approved by the CAAT**.**

CHAPTER 12 Helicopter Emergency Medical Service Operations

DEFINITIONS

Elevated final approach and take-off area (elevated FATO) means a FATO that is at least 3 m above the surrounding surface.

Ground emergency service personnel means any ground emergency service personnel (such as policemen, firemen, etc.) involved with helicopter emergency medical services (HEMSs) and whose tasks are to any extent pertinent to helicopter operations.

HEMS dispatch centre means a place where, if established, the coordination or control of the helicopter emergency medical service (HEMS) flight takes place. It may be located in a HEMS operating base.

HEMS flight means 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:

(a) medical personnel; or

(b) medical supplies (equipment, blood, organs, drugs); or

(c) ill or injured persons and other persons directly involved;

HEMS Operating Base means an aerodrome at which the HEMS crew members and the HEMS helicopter may be on stand-by for HEMS operations.

HEMS Operating Site means a site selected by the commander during a HEMS flight for landing and take-off.

Medical Passenger. means a medical person carried in a helicopter during a HEMS flight, including but not limited to doctors, nurses and paramedics.

12.1 Helicopter emergency medical service (HEMS) operations

12.1.1 Helicopters shall only be operated for the purpose of HEMS operations if the operator has been approved by CAAT.

12.1.2 To obtain such approval by CAAT, the operator shall:

(a) operate in CAT and hold a CAT AOC in accordance with AOCR and HOR

(b) demonstrate to CAAT compliance with the requirements contained in this chapter.

12.1.3 The guidelines for HEMS operations is described in appendix D.

12.2 Equipment requirements for HEMS operations

The installation of all helicopter dedicated medical equipment and any subsequent modifications and, where appropriate, its operation shall be approved by CAAT.

Aircraft tracking system which is a ground based process to maintain and update at standardized intervals, a record of the four dimentional position of the aircraft in flight so that aviation security and air traffic concerns can be mitigated.

HEMS adapted interiors with as far as practicable gapless paneling to prevent leakage of fluids into interior spaces with flame retardant moisture-resistant interior panels.

HEMS operator must demonstrate that the medical equipment is electro-magnetic compatible and test report with source matrix is established.

Articles and substances which would otherwise be classified as dangerous goods shall be exempted from approval for HEMS flight when it is carried for the purpose of medical aid and to the extent specified in the ICAO Technical Instructions.

12.3 Communication

In addition to that required by CAAT announcement subject: Aircraft equipment, instrument and flight document, helicopters conducting HEMS flights shall have communication equipment capable of conducting two-way communication with the organization for which the HEMS is being conducted including flight following system for the duration of the HEMS mission and, where possible, to communicate with ground emergency service personnel.

12.4 HEMS operating minima

12.4.1 HEMS flights operated in performance class 1 and 2 shall comply with the weather minima in Table 1 for dispatch and en-route phase of the HEMS flight. In the event that during the en-route phase the weather conditions fall below the cloud base or visibility minima shown, helicopters certified for flights only under VMC

shall abandon the flight or return to base. Helicopters equipped and certified for instrument meteorological conditions)IMC(operations may abandon the flight, return to base or convert in all respects to a flight conducted under instrument flight rules)IFR(, provided the flight crew are suitably qualified.

Table 1	
HEMS operating minima	
2 PILOTS	
DAY	
Ceiling	Visibility
500 ft and above	As defined by the applicable airspace VFR minima
499 - 400 ft	1000 m(*)
399 - 300 ft	2000 m

(*) During the en-route phase visibility may be reduced to 800 m for short periods when in sight of land if the helicopter is maneuvered at a speed that will give adequate opportunity to observe any obstacles in time to avoid a collision.

12.4.2 The weather minima for the dispatch and en-route phase of a HEMS flight operated in performance class 3 shall be a cloud ceiling of 600 ft and a visibility of 1500 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.

12.5 Performance requirements for HEMS operations

12.5.1 Performance class 3 operations shall not be conducted over a hostile environment.

12.5.2 Take-off and landing

(a) Helicopters conducting operations to/from a final approach and take-off area (FATO) at a hospital that is located in a congested hostile environment and that is used as a HEMS operating base shall be operated in accordance with performance class 1.

(b) Helicopters conducting operations to/from a FATO at a hospital that is located in a congested hostile environment and that is not a HEMS operating base shall be operated in accordance with performance class 1.

12.5.3 Helicopters conducting operations to/from a HEMS operating site located in a hostile environment shall be operated in accordance with performance class 2 and provide compliance is shown implement set conditions:

(a) conduct a risk assessment, specifying:

1) the type of helicopter; and

2) the type of operations;

(b) validity of the risk assessment. The operator should periodically review and update the procedures and associated risk assessments to ensure that they are adequate and remain relevant for the operation.

(1) Attain and maintain the helicopter/engine modification standard defined by the manufacturer;

(2) Conduct the preventive maintenance actions recommended by the helicopter or engine manufacturer;

(3) Include take-off and landing procedures in the operations manual, where they do not already exist in the AFM;

(4) specify training for flight crew; and

(5) provide a system for reporting to the manufacturer loss of power, engine shutdown or engine failure events; and

(6) implement a usage monitoring system (UMS)

12.5.4 The HEMS operating site shall be big enough to provide adequate clearance from all obstructions and should have a minimum dimension of at least 2 x D)the largest dimensions of the helicopter when the rotors are turning(.

12.6 Crew requirements

12.6.1 Selection. The operator shall establish criteria for the selection of flight crew members for the HEMS task, taking previous experience into account.

12.6.2 *Experience*. The minimum experience level for the commander conducting HEMS flights shall not be less than:

(a) 1,000 hours as pilot-in-command/commander of aircraft of which 500 hours are as pilot-in-command/commander on helicopters.

(b) 500 hours' operating experience in helicopters, gained in an operational environment similar to the intended operation sea, mountain, big cities with heavy traffic, etc.

12.6.2.1 The minimum experience level for the co-pilot conducting HEMS flights shall not be less than 500 hours on helicopters.

12.6.3 Operational training. Successful completion of operational training in accordance with the HEMS procedures contained in the operations manual.

12.6.4 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 an FSTD within the last six months. The recency may be obtained in a visual flight rules)VFR(helicopter using vision limiting devices such as goggles or screens, or in an FSTD.

12.6.5 The minimum crew shall be two pilots.

12.6.6 Crew training and checking

(a) Training and checking shall be conducted in accordance with a detailed syllabus approved by CAAT and included in the operations manual.

(b) Crew members

(1) Crew training programmes shall: improve knowledge of the HEMS working environment and equipment; improve crew coordination; and include measures to minimise the risks associated with en-route transit in low visibility conditions, selection of HEMS operating sites and approach and departure profiles.

(2) The measures referred to in (12.6.6)(b)(1) shall be assessed during operator proficiency checks and line checks.

12.6.7 TRAINING AND CHECKING SYLLABUS

(a) The flight crew training syllabus should include the following items:

(1) meteorological training concentrating on the understanding and interpretation of available weather information;

(2) preparing the helicopter and specialist medical equipment for subsequent HEMS departure;

(3) practice of HEMS departures;

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

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

(b) The flight crew checking syllabus should include:

(1) proficiency checks, which should include landing and take-off profiles likely to be used at HEMS operating sites; and

(2) line checks, with special emphasis on the following:

(i) local area meteorology;

(ii) HEMS flight planning;

(iii) HEMS departures;

(iv) the selection from the air of HEMS operating sites;

(v) low level flight in poor weather; and

(vi) familiarity with established HEMS operating sites in the operator's local area register.

12.6.8 LINE CHECKS

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 proficiency checks.

12.6.9 HEMS medical passenger and other personnel briefing

(a) Medical passenger. Prior to any HEMS flight, or series of flights, medical passengers shall have been briefed to ensure that they are familiar with the HEMS working environment and equipment, can operate on-board medical and emergency equipment and can take part in normal and emergency entry and exit procedures.

(b) Ground emergency service personnel. The operator shall take all reasonable measures to ensure that ground emergency service personnel are familiar with the HEMS working environment and equipment and the risks associated with ground operations at a HEMS operating site.

(c) Medical patient, a briefing shall only be conducted if the medical condition makes this practicable.

(d) The briefing should ensure that the medical passenger understands his/her role in the operation, which includes:

(1) familiarization with the helicopter type(s) operated;

(2) entry and exit under normal and emergency conditions both for self and patients;

(3) use of the relevant on-board specialist medical equipment;

(4) the need for the commander's approval prior to use of specialized equipment;

(5) method of supervision of other medical staff;

(6) the use of helicopter inter-communication systems;

(7) location and use of on board fire extinguishers; and

(8) the operator's crew coordination concept including relevant elements of crew resource management.

(9) Another means of complying with the rule as compared to that contained in AOCR Chapter 7 Para 3

12.7 Ground Emergency Service Personnel

12.7.1 The task of training large numbers of emergency service personnel is formidable. Wherever possible, helicopter operators should afford every assistance to those persons responsible for training emergency service personnel in HEMS support. This can be achieved by various means, such as, but not limited to, the production of flyers, publication of relevant information on the operator's web site and provision of extracts from the operations manual.

12.7.2 The elements that should be covered include:

(a) two-way radio communication procedures with helicopters;

(b) the selection of suitable HEMS operating sites for HEMS flights;

(c) the physical danger areas of helicopters;

(d) crowd control in respect of helicopter operations; and

(e) the evacuation of helicopter occupants following an on- site helicopter accident.

12.8 Information and documentation

12.8.1 The operator shall ensure that, as part of its risk analysis and management process, risks associated with the HEMS environment are minimized by specifying in the operations manual: selection, composition and training of crews; levels of equipment and dispatch criteria; and operating procedures and minima, such that normal and likely abnormal operations are described and adequately mitigated.

12.8.2 Relevant extracts from the operations manual shall be made available to the organization for which the HEMS is being provided.

12.8.3 OPERATIONS MANUAL

The operations manual should include:

(a) the use of portable equipment on board;

(b) guidance on take-off and landing procedures at previously unsurveyed HEMS operating sites;

(c) the final reserve fuel;

(d) operating minima;

(e) recommended routes for regular flights to surveyed sites, including the minimum flight altitude;

(f) guidance for the selection of the HEMS operating site in case of a flight to an unsurveyed site;

(g) the safety altitude for the area overflown; and

(h) procedures to be followed in case of inadvertent entry into cloud;

(i) obstacle clearance procedure to be followed in HEMS operations;

(j) a directory of pre-surveyed landing sites within its intended area of operations this information shall contain timely recording and identification of obstructions.

12.9 HEMS operating base facilities

12.9.1 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.

12.9.2 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 air traffic services)ATS(unit. Adequate facilities shall be available for the planning of all tasks.

12.9.3 Every operating base shall have a system of obtaining current and reliable weather forecast information and shall be provided with satisfactory communications with the appropriate air traffic services (ATS) unit along with full communication link with HEMS dispatch center, in case it is not co-located.

12.10 Fuel supply

12.10.1 When the HEMS mission is conducted under VFR within a local and defined geographical area, standard fuel planning can be employed provided the operator establishes final reserve fuel to ensure that, on completion of the mission the fuel remaining is not less than an amount of fuel sufficient for:

(a) 30 minutes of flying time at normal cruising conditions; or

(b) when operating within an area providing continuous and suitable precautionary landing sites, 20 minutes of flying time at normal cruising speed.

12.10.2 Refuelling with passengers embarking, on board or disembarking

When the commander considers refuelling with passengers on board to be necessary, it can be undertaken either rotors stopped or rotors turning provided the following requirements are met:

(a) door(s) on the refuelling side of the helicopter shall remain closed;

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

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

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

APPENDIX A: Flight Data Recorders and Aircraft Data Recording Systems

Note 1.— Crash-protected flight recorders comprise one or more of the following :

— a flight data recorder (FDR),
— a cockpit voice recorder (CVR),
— an airborne image recorder (AIR),
— a data link recorder (DLR).

When image or data link information is required to be recorded on a crash-protected flight recorder, it is permissible to record it on either the CVR or the FDR.

As per this appendix, image and data link information may be recorded on either the CVR or the FDR.

Note 2.— Combination recorders (FDR/CVR) may be used to meet the flight recorder equipage requirements.

Note 3.— Detailed requirements on flight recorders are contained in this appendix.

Note 4.— Lightweight flight recorders comprise one or more of the following:

— an aircraft data recording system (ADRS),
— a cockpit audio recording system (CARS),
— an airborne image recording system (AIRS),
— a data link recording system (DLRS)

When image or data link information is required to be recorded on a crash-protected flight recorder, it is permissible to record it on either the CARS or the ADRS.

As per this appendix, image and data link information may be recorded on either the CARS or the ADRS.

1. Flight Recorders for Helicopters

The material in this appendix concerns flight recorders intended for installation in helicopters operating under HOR Chapter 4, Paragraph 4.3.

1.1 General Requirements

1) Non-deployable flight recorder containers shall be painted a distinctive orange colour.

2) Non-deployable crash-protected flight recorder containers shall:

(a) carry reflective material to facilitate their location; and

(b) have securely attached an automatically activated underwater locating device operating at a frequency of 37.5 kHz.At the earliest practical date, but not later than 1 January 2018, this device shall operate for a minimum of 90 days.

3) Automatic deployable flight recorder containers shall:

(a) be painted a distinctive orange colour, however the surface visible from outside the helicopter may be of another colour;

(b) carry reflective material to facilitate their location; and

(c) have an integrated automatically activated ELT.

(d) The flight recorder systems shall be installed so that:

(e) the probability of damage to the recordings is minimized;

(f) there is an aural or visual means for preflight checking that the flight recorder systems are operating properly; and

(g) if the flight recorder systems have an erasure device, the installation shall be designed to prevent operation of the device during flight time or crash impact; and

(h) 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.

4) The flight recorder systems shall be installed so that:

(a) the probability of damage to the recordings is minimized;

(b) there is an aural or visual means for preflight checking that the flight recorder systems are operating properly; and

(c) if the flight recorder systems have an erasure device, the installation shall be designed to prevent operation of the device during flight time or crash impact; and

(d) 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.

5) The crash-protected flight recorders shall be installed so that they receive electrical power from a bus that provides the maximum reliability for operation of the flight recorders without jeopardizing service to essential or emergency loads.

6) The lightweight flight recorders shall be connected to a power source having the characteristics which ensure proper and reliable recording in the operational environment.

7) The flight recorder systems, when tested by methods approved by the appropriate certificating authority, shall be demonstrated to be suitable for the environmental extremes over which they are designed to operate.

8) Means shall be provided for an accurate time correlation between the flight recorder systems functions.

9) The manufacturer usually provides the appropriate certificating authority with the following information in respect of the flight recorder systems:

(a) manufacturer's operating instructions, equipment limitations and installation procedures;

(b) parameter origin or source and equations which relate counts to units of measurement; and

(c) manufacturer's test reports.

1.2 Flight data recorder (FDR) and aircraft data recording system (ADRS)

1) Start and stop logic

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.

2) Parameters to be recorded

Note: In previous editions of Annex 6, Part III, types of recorders were defined to capture the first evolutions of FDRs.

(a) The parameters that satisfy the requirements for FDRs, are listed in Table A-1 below. 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.

(b) 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, attitude/longitude
- Radio altitude*

(c) If further FDR recording capacity is available, recording of the following additional information shall be considered:

(1) additional operational information from electronic displays, such as electronic flight instrument systems) EFIS(, electronic centralized aircraft monitor) ECAM(and engine indication and crew alerting system)EICAS(; and

(2) additional engine parameters)EPR, N1, fuel flow, etc.(.

(d) The parameters that satisfy the requirements for ADRS are the first 7 parameters listed in Table A-3.

(e) If further ADRS recording capacity is available, the recording of any parameters from 8 onwards defined in Table A-3 shall be considered.

3) Additional information

(a) The measurement range, recording interval and accuracy of parameters on installed equipment is usually verified by methods approved by the appropriate certificating authority.

(b) Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/maintenance information shall be maintained by the operator/owner. The documentation shall be sufficient to ensure that accident investigation authorities have the necessary information to read out the data in engineering units.

1.3 Cockpit voice recorder)CVR(and cockpit audio recording system)CARS(

1) Start and stop logic

The CVR or CARS 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 CVR or CARS shall start to record as early as possible during the cockpit checks prior to engine start at the beginning of the flight until the cockpit checks immediately following engine shutdown at the end of the flight.

2) Signals to be recorded

(a) The CVR shall record simultaneously 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 simultaneously 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.

1.4 Airborne image recorder (AIR) and airborne image recording systems (AIRS)

1) Start and stop logic

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.

2) Classes

(a) A Class A AIR or AIRS captures the general cockpit area in order to provide data supplemental to conventional flight recorders.

Note 1; To respect crew privacy, the cockpit area view may be designed as far as practical to exclude the head and shoulders of crew members whilst seated in their normal operating position.

Note 2: There are no provisions for Class A AIR or AIRS in this document.

(b) A Class B AIR or AIRS captures data link message displays.

Note: A Class B AIR could be a means for recording data link communications applications messages to and from the helicopters where it is not practical or is prohibitively expensive to record those data link communications applications messages on FDR or CVR.

(c) 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 prohibitively expensive to record on an FDR, or where an FDR is not required.

1.5 Data link recorder (DLR)

1) Applications to be recorded

(a) 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 to 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.

(b) Messages applying to the applications listed in Table A-2 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.

Table A-1 Parameter Characteristic for Flight Data Recorder

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

Table A-2 Description of Applications for Data Link Recorders

Item No.	Application type	Application description	Recording content
1	Data link initiation	This includes any applications used to log on to or initiate data link service. In FANS-1/A and ATN, these are ATS facilities notification (AFN) and context management (CM) respectively.	C
2	Controller/pilot communication	This includes any application used to exchange requests, clearances, instructions and reports between the flight crew and controllers on the ground. In FANS-1/A and ATN, this includes the CPDLC application. It also includes applications used for the exchange of oceanic (OCL) and departure clearances (DCL) as well as data link delivery of taxi clearances.	C
3	Addressed surveillance	This includes any surveillance application in which the ground sets up contracts for delivery of surveillance data. In FANS-1/A and ATN, this includes the automatic dependent surveillance — contract (ADS-C) application. Where parametric data are reported within the message they shall be recorded unless data from the same source are recorded on the FDR.	C
4	Flight information	This includes any service used for delivery of flight information to specific aircraft. This includes, for example, data link aviation weather report service (D-METAR), data link-automatic terminal service (D-ATIS), digital Notice to Airmen (D-NOTAM) and other textual data link services.	C
5	Aircraft broadcast surveillance	This includes elementary and enhanced surveillance systems, as well as automatic dependent surveillance — broadcast (ADS-B) output data. Where parametric data sent by the 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.

Table A-3 Parameter Characteristic for Aircraft Data Recording Systems

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	

2. Guideline to Current Flight Recorder Provisions

Table A-4 Standards for the recording of flight parameters for Helicopter

<table>
<tr><td colspan="5">Maximum Certificated Take-off mass
(MCTOM)</td></tr>
<tr><td rowspan="2">Date</td><td>Seating configuration of more than 19 passengers or over 7 000 kg</td><td>Over 3 175 kg</td><td>Over 2 250 kg up to 3 175 kg</td><td>Less than 3 175 kg</td></tr>
<tr><td>All helicopters first certificate of airworthiness</td><td>All helicopters first certificate of airworthiness</td><td>All turbine helicopters new type certificate</td><td>All helicopters first certificate of airworthiness</td></tr>
<tr><td>1989
→</td><td>HOR
Paragraph 4.3.1.1 (b)</td><td>-</td><td rowspan="2">-</td><td rowspan="2">-</td></tr>
<tr><td>2016
→</td><td colspan="2">HOR
Paragraph 4.3.1.1 (a)</td></tr>
<tr><td>2018
→</td><td colspan="2"></td><td>HOR
Paragraph 4.3.1.1 (c)</td><td>-</td></tr>
</table>

Table A-5. Data link communications)DLC(recording installation clarification

Rows	Date individual certificate of airworthiness was first issued	Date aircraft type certificate issued or modification for DLC equipment first approved	Date of activation for use of DLC equipment	DLC recording required	HOR Reference
1	On or after 1 January 2016	On or after 1 January 2016	On or after 1 January 2016	Yes	4.3.3.2 (a)
2	On or after 1 January 2016	Before 1 January 2016	On or after 1 January 2016	Yes	4.3.3.2 (a)
3	Before 1 January 2016	On or after 1 January 2016	On or after 1 January 2016	Yes	4.3.3.2 (b)
4	Before 1 January 2016	Before 1 January 2016	Before 1 January 2016	No	4.3.3.2 (b)
5	Before 1 January 2016	Before 1 January 2016	On or after 1 January 2016	No	4.3.3.2 (b)

3. Inspection of Flight Records 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 system 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 system 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.

(3) Recording system inspections shall be carried out as follows:

(a) an analysis of the recorded data from the flight recorders shall ensure that the recorder operates correctly for the nominal duration of the recording;

(b) a complete flight recording from the FDR or ADRS shall be examined in engineering units to evaluate the validity of all recorded parameters. Particular attention shall be given to parameters from sensors dedicated to the FDR or ADRS. Parameters taken from the aircraft's electrical bus system need not be checked if their serviceability can be detected by other aircraft systems;

(c) the readout facility shall have the necessary software to accurately convert the recorded values to engineering units and to determine the status of discrete signals;

(d) an examination of the recorded signal on the CVR or CARS shall be carried out by replay of the CVR or CARS recording. While installed in the aircraft, the CVR or CARS shall record test signals from each aircraft source and from relevant external sources to ensure that all required signals meet intelligibility standards;

(e) where practicable, during the examination, a sample of in- flight recordings of the CVR or CARS shall be examined for evidence that the intelligibility of the signal is acceptable; and

(f) an examination of the recorded images on the AIR or AIRS shall be carried out by replay of the AIR or AIRS recording. While installed in the aircraft, the AIR or AIRS shall record test images from each aircraft source and from relevant external sources to ensure that all required images meet recording quality standards.

(g) an examination of the recorded messages on the DLR or DLRS shall be carried out by replay of the DLR or DLRS recording.

(4) A flight recorder system shall be considered unserviceable if there is a significant period of poor-quality data, unintelligible signals, or if one or more of the mandatory parameters is not recorded correctly.

(5) A report of the recording system inspection shall be made available on request to regulatory authorities for monitoring purposes.

(6) Calibration of the FDR system:

(a) for those parameters which have sensors dedicated only to the FDR and are not checked by other means, recalibration shall be carried out at least every five years or in accordance with the recommendations of the sensor manufacturer to determine any discrepancies in the engineering conversion routines for the mandatory parameters and to ensure that parameters are being recorded within the calibration tolerances; and

(b) when the parameters of altitude and airspeed are provided by sensors that are dedicated to the FDR system, there shall be a recalibration performed as recommended by the sensor manufacturer, or at least every two years.

APPENDIX B: Medical Supplies

The following provides information on typical contents of a first- aid kit for carriage aboard a helicopter:

- List of contents
- Antiseptic swabs (10/pack)
- Bandage: adhesive strips
- Bandage: gauze 7.5 cm × 4.5 m
- Bandage: triangular; safety pins
- Dressing: burn 10 cm × 10 cm
- Dressing: compress, sterile 7.5 cm × 12 cm
- Dressing: gauze, sterile 10.4 cm × 10.4 cm
- Tape: adhesive 2.5 cm (roll)
- Steris-strips (or equivalent adhesive strip)
- Hand cleanser or cleansing towelettes
- Pad with shield, or tape, for eye
- Scissors: 10 cm (if allowed by national regulations)
- Tape: Adhesive, surgical 1.2 cm × 4.6 m
- Tweezers: splinter
- Disposable gloves (multiple pairs)
- Thermometers (non-mercury)
- Mouth-to-mouth resuscitation mask with one-way valve
- First-aid manual, current edition
- Incident record form

The following suggested medications can be included in the first- aid kits where permitted by national regulations:

- Mild to moderate analgesic
- Antiemetic
- Nasal decongestant
- Antacid
- Antihistamine

Universal precaution kit

A universal precaution kit shall be carried on a helicopter that is required to operate with at least one cabin crew member. Such a kit may be used to clean up any potentially infectious body contents such as blood, urine, vomit and faces and to protect the cabin crew who are assisting potentially infectious cases of suspected communicable disease.

Typical contents

— Dry powder that can convert small liquid spill into a sterile granulated gel

— Germicidal disinfectant for surface cleaning

— Skin wipes

— Face/eye mask (separate or combined)

— Gloves (disposable)

— Protective apron

— Large absorbent towel

— Pick-up scoop with scraper

— Bio-hazard disposal waste bag

— Instructions

APPENDIX C: Flight Crew Member Training Programme Helicopter

(1) The operator shall outline, in its training programme, details of the initial and recurrent flight crew training, transition (conversion) , re- qualification, upgrade, recency of experience, familiarization, difference and other specialized training, as applicable.

(2) The training programme may be based on those prepared by Aircraft Manufacturer or by Training Organisation approved or recognized by the CAAT.

(3) Training Manual

1.1 It is a statutory requirement in the Authority Announcement that a "training manual shall contain all such information and instructions as may be necessary to enable a person appointed by the operator to give or to supervise the training, experience, practice and periodical tests to perform his duties".

1.2 Applicants for Air Operator Certificates are required to prepare a training manual and to submit a copy to the Authority, together with their application for approval. The manual will be regarded by the Authority as a primary indication of the standards of training and checking likely to be achieved. It should give formal expression to the operator's training policy and requirements, together with adequate guidance to instructors and examiners.

1.3 Each copy of a manual should normally bear a serial number, and a list of holders should be maintained by the person responsible for issuing amendments. Where this system is not used, an operator should have satisfactory alternative arrangements for controlling the issue and amendment of manuals. Each volume of a manual should be numbered and bear a title and list of contents giving a clear indication of its scope. The title of the person or department responsible for the issue of the manual should also be indicated. At the front of each volume there should be an amendment page to indicate amendment number, date of incorporation, signature or initials of persons amending, and page(s) or paragraph(s) affected. Amended pages should be dated. The numbering of pages, sections, paragraphs, etc. should be orderly and systematic so as to facilitate immediate identification of any part of the subject matter. The standard of printing, duplication, binding, section dividers, indexing of sections, etc. should be sufficient to enable the document to be read without difficulty and to ensure that it remains intact and legible during normal use.

1.4 All proposed amendment to the contents in a Training Manual must be presented to the Authority for approval before inclusion in the manual. The amendment of a manual in manuscript will not be acceptable. Changes or additions, however slight they may be, should normally be incorporated by the issue of a fresh or additional page on which the amendment material is clearly indicated.

1.5 Although the training manual is a part of the operations manual it should be a separate volume addressed primarily to training staff, each of whom should normally have a personal copy. The form that the manual takes will vary considerably according to the size and complexity of the operator's organisation and the aircraft he/she uses, and its adequacy will be assessed solely on the basis of its suitability for the operator's particular needs and circumstances.

1.6 The following matters should be covered in the manual normally in the volume addressed to training staff:

1.6.1 Requirements in respect of the qualifications, training and experience of training staff;

1.6.2 A comprehensive statement of the duties and responsibilities of all training staff, which should include their names, the type of training and/or checking which they may conduct as an Appendix for timely amendment purposes, and the types of aircraft used by the operator;

1.6.3 Minimum standards of experience and of initial and periodical training to be met by all aircraft crew for each type of aircraft used by the operator;

1.6.4 Detailed syllabi and specimen record forms for all training and checking;

1.6.5 Arrangements for administering and recording the periodical tests of all aircraft crew;

1.6.6 Methods of simulating instrument flight conditions;

1.6.7 Methods of simulating engine failure;

1.6.8 Procedures for touch- and- go or stop- and- go landings, minimum runway lengths and handling techniques;

1.6.9 Limitations on training and checking in the course of flights for the purpose of public transport. Note particularly that the simulation of instrument flight conditions and of emergencies affecting the flight characteristics of the aircraft is prohibited in the course of flights for the public transport of passengers;

1.6.10 Instructions covering rechecking and retraining after unsatisfactory performance or periods off flying due to illness or other causes;

1.6.11 The use of flight simulators; and

1.6.12 The assessment and training of crew in the use of Crew Resource Management and Human Factors.

1.6.13 The training of flight crew in the following areas:

(a) proper flight crew coordination and training in all types of emergency and abnormal situations or procedures caused by engine, airframe or systems malfunctions, fire or other abnormalities;

(b) avoidance of controlled flight into terrain and policy for the use of the ground proximity warning systems (GPWS); and

(c) knowledge and skills related to visual and instrument flight procedures for the intended area of operation, charting, human performance including threat and error management and in the transport of dangerous goods.

1.6.14 Operators, who wish to outsource initial, recurrent and conversion training, must ensure that the Authority approves the training courses. Approved training organisations or the equivalent that have State regulatory approval, may be accepted by the Authority to conduct training, however, courses still require the Authority approval. The qualification, training and approval of training and examining personnel utilised by an organisation, will normally be required to be approved by the Authority. The training provided and flight documentation used should reflect the operators' flight safety documents system.

(4) Training programme

4.1 Initial/Operator conversion training:

(a) The flight crew member shall complete the operator conversion training course before commencing unsupervised line flying:

(1) when changing to an aircraft for which a new type or class rating is required;

(2) when joining an operator.

(b) The operator conversion training course shall include training on the equipment installed on the aircraft as relevant to flight crew members' roles.

4.1.1 Operator conversion training and checking:

(a) CRM training shall be integrated into the operator conversion training course.

(b) Once an operator conversion course has been commenced, the flight crew member shall not be assigned to flying duties on another type or class of aircraft until the course is completed or terminated.

(c) The amount of training required by the flight crew member for the operator's conversion course shall be determined in accordance with the standards of qualification and experience specified in the operations manual, taking into account his/her previous training and experience.

(d) The flight crew member shall complete:

(1) the operator proficiency check and the emergency and safety equipment training and checking before commencing line flying under supervision (LIFUS); and

(2) the line check upon completion of line flying under supervision.

4.1.2 Operator conversion training syllabus:

(a) **General**

(1) The operator conversion training should include, in the following order:

(i) ground training and checking, including aircraft systems, and normal, abnormal and emergency procedures;

(ii) emergency and safety equipment training and checking, (completed before any flight training in an aircraft commences);

(iii) flight training and checking (aircraft and/or FSTD); and

(iv) line flying under supervision and line check.

(2) When the flight crew member has not previously completed an operator's conversion course, he/she should undergo general first-aid training and, if applicable, ditching procedures training using the equipment in water.

(3) Where the emergency drills require action by the non-handling pilot, the check should additionally cover knowledge of these drills.

(4) The operator's conversion may be combined with a new type/class rating training.

(5) The operator should ensure that CRM training are integrated into all appropriate phases of the conversion training; and

(b) Ground training

(1) Ground training should comprise a properly organised programme of ground instruction supervised by training staff with adequate facilities, including any necessary audio, mechanical and visual aids. Self- study using appropriate electronic learning aids, computer-based training (CBT), etc., may be used with adequate supervision of the standards achieved.

(2) The course of ground instruction should incorporate formal tests on such matters as aircraft systems, performance and flight planning, where applicable.

(c) Emergency and safety equipment training and checking

(1) Emergency and safety equipment training should take place in conjunction with cabin/technical crew undergoing similar training with emphasis on coordinated procedures and two- way communication between the flight crew compartment and the cabin.

(2) On the initial conversion course and on subsequent conversion courses as applicable, the following should be addressed:

(i) Instruction on first- aid in general (initial conversion course only); instruction on first-aid as relevant to the aircraft type of operation and crew complement, including those situations where no cabin crew is required to be carried (initial and subsequent).

(ii) Aero- medical topics, including hypoxia. hyperventilation contamination of the skin/ eyes by aviation fuel or hydraulic or other fluids, hygiene and food poisoning; and malaria.

(iii) The effect of smoke in an enclosed area and actual use of all relevant equipment in a simulated smoke-filled environment.

(iv) Actual firefighting, using equipment representative of that carried in the aircraft on an actual or simulated fire except that, with Halon extinguishers, an alternative extinguisher may be used.

(v) The operational procedures of security, rescue and emergency services.

(vi) Survival information appropriate to their areas of operation (e.g. polar, desert, jungle or sea) and training in the use of any survival equipment required to be carried.

(vii) A comprehensive drill to cover all ditching procedures where flotation equipment is carried. This should include practice of the actual donning and inflation of a life-jacket, together with a demonstration or audio-visual presentation of the inflation of life-rafts and/or slide-rafts and associated equipment. This practice should, on an initial conversion course, be conducted using the equipment in water, although previous certified training with another operator or the use of similar equipment will be accepted in lieu of further wet-drill training.

(viii) 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 aircraft (or a representative 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.

(d) Flight training

(1) Flight training should be conducted to familiarise the flight crew member thoroughly with all aspects of limitations and normal, abnormal and emergency procedures associated with the aircraft and should be carried out by suitably qualified class and type rating instructors and/or examiners. For specific operations, such as steep approaches or operations based on QFE, additional training should be carried out, based on any additional elements of training defined for the aircraft type.

(2) In planning flight training on aircraft with a flight crew of two or more, particular emphasis should be placed on the practice of Line-oriented flight training (LOFT) with emphasis on CRM, and the use of crew coordination procedures, including coping with incapacitation.

(3) Normally, the same training and practice in the flying of the aircraft should be given to co-pilots as well as commanders.

(4) Unless the type rating training programme has been carried out in an FSTD, the training should include at least three take-offs and landings in the aircraft.

(e) Line flying under supervision (LIFUS)

Line flying under supervision provides the opportunity for a flight crew member to carry into practice the procedures and techniques he/she has been made familiar with during the ground and flight training of an operator conversion 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 crew member should be able to perform a safe and efficient flight conducted within the tasks of his/her crew member station.

(1) Following completion of flight training and checking as part of the operator' s conversion course, each flight crew member should operate a minimum number of sectors and/or flight hours under the supervision of a flight crew member nominated by the operator.

(2) The minimum flight sectors/ hours should be specified in the operations manual and should be determined by the following:

(i) previous experience of the flight crew member;

(ii) complexity of the aircraft; and

(iii) the type and area of operation.

(f) **Passenger handling for operations** where no cabin crew is required

Other than general training on dealing with people, emphasis should be placed on the following:

(1) advice on the recognition and management of passengers who appear or are intoxicated with alcohol, under the influence of drugs or aggressive;

(2) methods used to motivate passengers and the crowd control necessary to expedite an aircraft evacuation; and

(3) the importance of correct seat allocation with reference to aircraft mass and balance. Particular emphasis should also be given on the seating of special categories of passengers.

(g) Discipline and responsibilities, for operations where no cabin crew is required

Emphasis should be placed on discipline and an individual's responsibilities in relation to:

(1) his/ her ongoing competence and fitness to operate as a crew member with special regard to flight and duty time limitation (FTL) requirements; and

(2) security procedures.

(h) **Passenger briefing/safety demonstrations, for operations** where no cabin crew is required Training should be given in the preparation of passengers for normal and emergency situations.

4.1.3 Completion of an operator's conversion course:

(i) The operator conversion course is deemed to have started when the flight training has begun. The theoretical element of the course may be undertaken ahead of the practical element.

(j) Under certain circumstances the 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 allow the pilot to revert to the original type.

(k) Before the resumption of the operator conversion course, the operator should evaluate how much of the course needs to be repeated before continuing with the remainder of the course.

4.2 Differences training and familiarisation training

(a) Flight crew members shall complete differences or familiarisation training when changing equipment or procedures requiring additional knowledge on types or variants currently operated.

(b) The operations manual shall specify when such differences or familiarisation training is required.

General

(a) Differences training requires additional knowledge and training on the aircraft or an appropriate training device. It should be carried out:

(1) when introducing a significant change of equipment and/ or procedures on types or variants currently operated; and

(2) when operating a variant of a helicopter currently operated.

(b) Familiarisation training requires only the acquisition of additional knowledge. It should be carried out when:

(1) operating another helicopter of the same type; or

(2) when introducing a significant change of equipment and/ or procedures on types or variants currently operated.

4.3 Recurrent training and checking

(a) Each flight crew member shall complete annual recurrent flight and ground training relevant to the type or variant of aircraft on which he/ she operates, including training on the location and use of all emergency and safety equipment carried.

(b) Each flight crew member shall be periodically checked to demonstrate competence in carrying out normal, abnormal and emergency procedures.

4.3.1 Recurrent training should comprise the following:

(1) Ground training

(i) The ground training programme should include:

(A) aircraft systems;

(B) operational procedures and requirements, including ground de- icing/anti-icing and pilot incapacitation; and

(C) accident/incident and occurrence review.

(ii) Knowledge of the ground training should be verified by a questionnaire or other suitable methods.

(iii) When the ground training is conducted within 3 calendar months prior to the expiry of the 12 calendar months period, the next ground and refresher training should be completed within 12 calendar months of the original expiry date of the previous training.

(2) Emergency and safety equipment training

(i) Emergency and safety equipment training may be combined with emergency and safety equipment checking and should be conducted in an aircraft or a suitable alternative training device.

(ii) Every year the emergency and safety equipment training programme should include the following:

(A) actual donning of a life-jacket, 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 aircraft;

(E) instruction on the location and use of all types of exits;

(F) security procedures.

(iii) Every 3 years the programme of training should include the following:

(A) actual operation of all types of exits;

(B) demonstration of the method used to operate a slide where fitted;

(C) actual fire-fighting using equipment representative of that carried in the aircraft on an actual or simulated fire except that, with Halon extinguishers, an alternative extinguisher may be used;

(D) the effects of smoke in an enclosed area and actual use of all relevant equipment in a simulated smoke-filled environment;

(E) actual handling of pyrotechnics, real or simulated, where applicable;

(F) demonstration in the use of the life-rafts where fitted. In the case of helicopters involved in extended over water operations, demonstration and use of the life-rafts.

Helicopter water survival training

Where life-rafts are fitted for helicopter extended overwater operations (such as sea pilot transfer, offshore operations, regular, or scheduled, coast-to-coast overwater operations), a comprehensive wet drill to cover all ditching procedures should be practised by aircraft crew. This wet drill should include, as appropriate, practice of the actual donning and inflation of a life-jacket, together with a demonstration or audio-visual presentation of the inflation of life-rafts. Crews should board the same (or similar) life-rafts from the water whilst wearing a life-jacket. Training should include the use of all survival equipment carried on board life-rafts and any additional survival equipment carried separately on board the aircraft;

— consideration should be given to the provision of further specialist training such as underwater escape training.

Where operations are predominately conducted offshore, operators should conduct 3- yearly helicopter underwater escape training at an appropriate facility; wet practice drill should always be given in initial training unless the crew member concerned has received similar training provided by another operator;

(G) particularly in the case where no cabin crew is required, first- aid, appropriate to the aircraft type, the kind of operation and crew complement.

(iv) The successful resolution of aircraft emergencies requires interaction between flight crew and cabin/ technical crew and emphasis should be placed on the importance of effective coordination and two- way communication between all crew members in various emergency situations.

(v) Emergency and safety equipment training should include joint practice in aircraft 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 cabin/ technical crew training should include joint discussion of emergency scenarios.

(vi) Emergency and safety equipment training should, as far as practicable, take place in conjunction with cabin/ technical crew undergoing similar training with emphasis on coordinated procedures and two- way communication between the flight crew compartment and the cabin.

(3) CRM should be integrated into all appropriate phases of recurrent training.

(4) Aircraft/FSTD training

(i) General

(A) The aircraft/ FSTD training programme should be established in a way that all major failures of aircraft systems and associated procedures will have been covered in the preceding 3-year period.

(B) When engine- out manoeuvres are carried out in an aircraft, the engine failure should be simulated.

(C) Aircraft/ FSTD training may be combined with the operator proficiency check.

(D) When the aircraft/ FSTD training is conducted within 3

calendar months prior to the expiry of the 12 calendar months period, the next aircraft/ FSTD training should be completed within 12 calendar months of the original expiry date of the previous training.

(ii) Helicopters

(A) Where a suitable FSTD is available, it should be used for the aircraft/FSTD training programme. If the operator is able to demonstrate, on the basis of a compliance and risk assessment, that using an aircraft for this training provides equivalent standards of training with safety levels similar to those achieved using an FSTD, the aircraft may be used for this training to the extent necessary.

(B) The recurrent training should include the following additional items, which should be completed in an FSTD:

- settling with power and vortex ring;

- loss of tail rotor effectiveness.

4.4 Pilot qualification to operate in either pilot's seat

Flight crew members who may be assigned to operate in either pilot's seat shall complete appropriate training and checking as specified in the operations manual.

APPENDIX D: Guidelines for Helicopter emergency medical service (HEMS)

1. Helicopter emergency medical service (HEMS) operations

1.1 Introduction

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 Chapter 12 to provide a system of safety to the appropriate standard**.** It discusses the difference between HEMS and air ambulance **-** in regulatory terms**.**

1.2 Helicopter emergency medical service (HEMS) flight

1.2.1 A HEMS flight (or more commonly referred to as 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.

1.2.2 The following elements should be regarded as integral parts of the HEMS mission:

flights to and from the HEMS operating site when initiated by the HEMS dispatch centre;

(a) flights to and from an aerodrome/operating site for the delivery or pick-up of medical supplies and/ or persons required for completion of the HEMS mission; and

(b) flights to and from an aerodrome/ operating site for refuelling required for completion of the HEMS mission.

1.3 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. In this view three groups are being protected:

(a) third parties)including property(- highest protection;

(b) passengers)including patients(; and

(c) crew members – lowest.

It is for the Legislator to facilitate a method for the assessment of risk - or as it is more commonly known, safety management)refer to AOCR Ch. 1 para 10(.

1.4 Risk management

Safety management textbooks describe four different approaches to the management of risk**.** All but the first have been used in the production of this section and, if it is considered that the engine failure accountability of performance class 1 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**):**

1.4.1 Applying the taxonomy to HEMS gives:

(a) zero risk; no risk of accident with a harmful consequence – performance class 1 (within the qualification stated above) - the HEMS operating base;
(b) 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 final approach and take-off areas (elevated FATOs) 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);
(c) 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);
(d) as low as reasonably practicable; where additional controls are not economically or reasonably practicable - operations at the HEMS operating site (the accident site).

1.4.2 HEMS operations are conducted in accordance with the requirements contained in AOCR, except for the variations contained in HOR, for which a specific approval is required. In simple terms there are three areas in HEMS operations where risk, beyond that allowed in AOCR and HOR, are identified and related risks accepted:

(a) in the en-route phase, where alleviation is given from height and visibility rules;

(b) at the accident site, where alleviation is given from the performance and size requirement; and

(c) at an elevated hospital site in a congested hostile environment, where alleviation is given from the deck edge strike - providing elements of the HOR 12.5.3 are satisfied.

(d) 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 is mandated. (HEMS crews and medical passengers are also expected to operate in accordance with good crew resource management (CRM) principles.)

1.5 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 AOCR and HOR 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.

To provide a road ambulance analogy:

(a) 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);

(b) 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 that the aviation risk should be proportionate to the task.

It is for the medical professional to decide between HEMS or air ambulance - not the pilot. For that reason, 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 principal and alternative sites. 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 Air Operator Certificate (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.

1.6 Operating under a HEMS approval

There are only two possibilities: transportation as passengers or cargo under the full auspices of AOCR and HOR (this does not permit any of the alleviations of HOR chapter 12 landing and take-off performance should be in compliance with the performance of AOCR Chapter 9 Para 10), or operations under a HEMS approval as contained in Chapter 12.

1.7 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 is expected to be inversely proportional to the amount of use of the site. The types of site are as follows:

(a) 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 HEMS operating base and for that reason no alleviation from operating procedures or performance rules are contained in Chapter 12.

(b) 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.

(c) 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 were 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 alleviation under Chapter 12.

1.8 Summary

In summary, the following points are considered to be pertinent to the HEMS philosophy and HEMS regulations:

(1) absolute levels of safety are conditioned by society;

(2) potential risk must only be to a level proportionate to the task;

(3) protection is afforded at levels appropriate to the occupants;

(4) this appendix addresses a number of risk areas and mitigation is built in;

(5) only HEMS operations are dealt with by this appendix;

(6) there are three main categories of HEMS sites and each is addressed appropriately

2. HEMS operating minima

REDUCED VISIBILITY

(a) In the rule the ability to reduce the visibility for short periods has been included. This will allow the commander to assess the risk of flying temporarily into reduced visibility against the need to provide emergency medical service, taking into account the advisory speeds included in Table 1. Since every situation is different it was not felt appropriate to define the short period in terms of absolute figures. It is for the commander to assess the aviation risk to third parties, the crew and the aircraft such that it is proportionate to the task, using the principles of this appendix para 1.3

(b) 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).

Table 1
Operating minima – reduced visibility

Visibility (m)	**Advisory speed (kt)**
800	50
1500	100
2000	120