CIVIL AVIATION DIRECTIVES – 6 PART 3

HELICOPTER OPERATIONS

CIVIL AVIATION AUTHORITY OF MALAYSIA

ISSUE 01
REVISION 00 – 1ST APRIL 2021

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Introduction

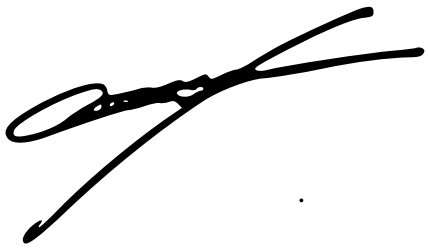
In exercise of the powers conferred by Section 24O of the Civil Aviation Act 1969 [Act 3], the Chief Executive Officer makes this Civil Aviation Directive 6 Part 3 – Helicopter Operations ("CAD 6 Part 3 – Helicopter Operations"), pursuant to Regulation(s) 26, 30, 31, 32, 34, 38, 39, 40, 41, 42, 43, 46, 48, 49, 81, 82, 83, 84, 85, 86, 87, 88, 88, 89, 91, 96, 101, 110, 111, 115, 116, 118, 119, 120,121, 123, 125, 127, 136, 161 and 202 of the Malaysian Civil Aviation Regulations (MCAR) 2016.

The Standards and requirements in this CAD are based mainly on the Standards and Recommended Practices (SARPs) contained in the International Civil Aviation Organisation (ICAO) Annex 6 Part 3 to the Chicago Convention – Operation of Aircraft: International Operations – Helicopters, Amendment 23.

Civil Aviation Directive 6 Part 3 – Helicopter Operations ("CAD 6 Part 3 – Helicopter Operations) is published by the Chief Executive Officer under Section 24O of the Civil Aviation Act 1969 [Act 3] and come into operation on 1 April 2021.

Non-compliance with this CAD

Any person who contravenes any provision in this CAD commits an offence and shall on conviction be liable to the punishments under Section 24O (2) of the Civil Aviation Act 1969 [Act 3] and/or under Malaysia Civil Aviation Regulation 2016.



(Captain Chester Voo Chee Soon)
Chief Executive Officer
Civil Aviation Authority of Malaysia

Civil Aviation Directive components and Editorial practices

This Civil Aviation Directive is made up of the following components and are defined as follows:

Standards: Usually preceded by words such as *"shall"* or *"must"*, are any specification for physical characteristics, configuration, performance, personnel or procedure, where uniform application is necessary for the safety or regularity of air navigation and to which Operators must conform. In the event of impossibility of compliance, notification to the CAAM is compulsory.

Recommended Practices: Usually preceded by the words such as "*should"* or "*may*", are any specification for physical characteristics, configuration, performance, personnel or procedure, where the uniform application is desirable in the interest of safety, regularity or efficiency of air navigation, and to which Operators will endeavour to conform.

Appendices: Material grouped separately for convenience but forms part of the Standards and Recommended Practices stipulated by the CAAM.

Definitions: Terms used in the Standards and Recommended Practices which are not self-explanatory in that they do not have accepted dictionary meanings. A definition does not have an independent status but is an essential part of each Standard and Recommended Practice in which the term is used, since a change in the meaning of the term would affect the specification.

Tables and Figures: These add to or illustrate a Standard or Recommended Practice and which are referred to therein, form part of the associated Standard or Recommended Practice and have the same status.

Notes: Included in the text, where appropriate, Notes give factual information or references bearing on the Standards or Recommended Practices in question but not constituting part of the Standards or Recommended Practices;

Attachments: Material supplementary to the Standards and Recommended Practices or included as a guide to their application.

It is to be noted that some Standards in this Civil Aviation Directive incorporates, by reference, other specifications having the status of Recommended Practices. In such cases, the text of the Recommended Practice becomes part of the Standard.
The units of measurement used in this document are in accordance with the International System of Units (SI) as specified in CAD 5. Where CAD 5 permits the use of non-SI alternative units, these are shown in parentheses following the basic units. Where two sets of units are quoted it must not be assumed that the pairs of values are equal and interchangeable. It may, however, be inferred that an equivalent level of safety is achieved when either set of units is used exclusively.

Any reference to a portion of this document, which is identified by a number and/or title, includes all subdivisions of that portion.

Throughout this Civil Aviation Directive, the use of the male gender should be understood to include male and female persons

Record of revisions

Revisions to this Directive shall be made by authorised personnel only. After inserting the revision, enter the required data in the revision sheet below. The *'Initials'* has to be signed off by the personnel responsible for the change.

Rev No.	Revision Date	Revision Details	Initials

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CAD 6 - PART 3

HELICOPTER

SECTION I

GENERAL

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1 General

1.1 Citation

1.1.1 These Directives are the Civil Aviation Directives 6 Part 3 – Helicopter Operations (CAD 6 Part 3 – Helicopter Operations), Issue 01/Revision 00, and comes into operation on 1 April 2021.

1.1.2 This CAD 6 Part 3 – Helicopter Operations, Issue 01/Revision 00 will remain current until withdrawn or superseded.

1.2 Applicability

1.2.1 This CAD applies to all operators and crew conducting commercial air transport operations ,general aviation operations and aerial work that involves helicopters.

1.3 Revocation

1.3.1 This CAD, in conjunction with CAD 6 Part 1 – CAT revokes 60CA-16 Issue 2 Amendment 1, Flight Operations Directive – Commercial Air Transport dated 15 July 2019.

1.3.2 This CAD revokes ORO.SEC.100.H of SUBPART SEC – SECURITY of the Flight Operations Directive – Organisation Requirements For Air Operations 60OR-16 Issue 3 Amendment 0 dated 15 July 2019.

1.3.3 This CAD revokes FOD 001/2017 Requirements of a foreign helicopter pilot for commercial air transport operations dated 15 June 2017.

1.3.4 This CAD revokes

a) Notice 6403 Airworthiness Requirement: Aircraft Leasing Arrangement, issue 1 dated 15th July 2019

b) Notice 6204 Electronic Flight Bag, issue 1 dated 18th May 2020

c) Notice 6302 Performance – Based Navigation (PBN) – Airworthiness Review issue 1 dated 17th June 2020

d) Notice 6307 Low Visibilty Operations (LVO) – Airworthiness Review issue 1 dated 13th October 2020

e) Airworthiness Notice 83A Flight Recorders – Helicopters, Issue 1 15th May 2005

1.4 Abbreviations

%	Percent
°C	Degrees Celcius
ACAS	Airborne collision avoidance systems
ADRS	Aircraft data recording system
ADS-C	Automatic dependent surveillance – contract

AEO	All Engines Operative
AFCS	Automatic flight control system
AIR	Airborne image recorder
AIRS	Airborne image recording system
AOC	Air operator certificate
APCH	Approach
AR	Authorisation required
ATC	Air traffic control
ATM	Air traffic management
ATN	Aeronautical telecommunication network
ATS	Air traffic services
CAA	Civil Aviation Authority
CAAM	Civil Aviation Authority Malaysia
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 Organisation for Civil Aviation Equipment
EVS	Enchanced 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
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	Milibar
MDA	Minimum descent altitude
MDA/H	Minimum descent altitude/height
MDH	Minimum descent height
MEL	Minimum equipment list
MHz	Megahertz
MLS	Microwave landing system
MMEL	Master minimum equipment list
MOPS	Minimum operational performance specification
N_1	Low pressure compressor speed (two-stage compressor); fan speed (three-stage compressor)
NM	Nautical mile
NPA	Non-Precision Approach
NVIS	Night vision imaging system
OCA	Obstacle clearance altitude
OCA/H	Obstacle clearance altitude/height
OCH	Obstacle clearance height
OGE	Out of Ground Effect
OM	Operations Manual
PANS	Procedures for Air Navigation Services
PBC	Performance-based communication
PBN	Performance-based navigation
PBS	Performance-based surveillance
PIS	Public interest site
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
T_4	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
V_{TOSS}	Take-off safety speed
V_y	Best rate of climb speed

1.5 Definitions

This Civil Aviation Directive is made up of the following components and are defined as follows:

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

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

Aircraft operating manual means a manual, acceptable to the CAAM, containing normal, abnormal and emergency procedures, checklists, limitations, crew 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) means a certificate authorising an operator to carry out specified commercial air transport operations.

Air traffic service (ATS) means 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 means the status of an aircraft, or its engine, propeller or part which conforms to the approved type design and is in a condition for safe operation.

Alternate heliport means 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 means 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.

Appropriate airworthiness requirements means the comprehensive and detailed airworthiness codes established, adopted or accepted by a Contracting State for the class of aircraft, engine or propeller under consideration.

Area navigation (RNAV) means 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 means a crew member who performs, in the interest of safety of passengers, duties assigned by the operator or the pilot-in-command of the aircraft, but who shall not act as a flight crew member.

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

Commercial air transport operation means an aircraft operation involving the transport of passengers, cargo or mail for hire or reward.

Configuration deviation list (CDL) means a list established by the organisation 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 means in relation to a city, town or settlement, any area which is substantially used for residential, commercial or recreational purposes.

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

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

Continuous descent final approach (CDFA) means a technique, consistent with stabilized approach procedures, for flying the final approach segment (FAS) of an instrument non-precision approach (NPA) procedure as a continuous descent, without level- off, from an altitude/height at or above the final approach fix altitude/height to a point approximately 15 m (50 ft) above the landing runway threshold or the point where the flare manoeuvre 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 means a person assigned by an operator to duty on an aircraft during a flight duty period.

Dangerous goods means 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 CAD 18, Chapter 3.

Decision altitude (DA) *or* ***decision height (DH)*** means a specified altitude or height in a three dimensional (3D) instrument approach operation or circling approach operation below which descent must not be made without the required visual reference.

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) means 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) means 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.

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

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

Electronic flight bag (EFB) means an electronic information system, comprising 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 means a heliport located on a raised structure on land.

Emergency locator transmitter (ELT) means 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)) means an automatically activated ELT which is permanently attached to an aircraft.

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

Automatic deployable ELT (ELT(AD)) means 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)***)** means an ELT which is removable from an aircraft, stowed so as to facilitate its ready use in an emergency, and manually activated by survivors and designed to be tethered to a life raft or survivor.

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

Enhanced vision system (EVS) means 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 means that part of the flight from the end of the take-off and initial climb phase to the commencement of the approach and landing phase.

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

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

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

Final approach and take-off area (FATO) means 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) means that segment of an instrument approach procedure in which alignment and descent for landing are accomplished.

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

Note.- As defined in MCAR 2016, flight crew member specifically means in relation to an aircraft, those members of the crew of the aircraft who respectively undertake to act as pilot, flight navigator, flight engineer and flight radiotelephony operator of the aircraft.

Flight data analysis programme means a programme of analysing recorded flight data in order to improve the safety of flight operations.

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

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

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

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

Flight recorder means 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 means a set of interrelated documentation established by the operator, compiling and organising 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 means 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 means the total time from the moment a helicopter's rotor blades start turning until the moment the helicopter finally comes to rest at the end of the flight, and the rotor blades are stopped.

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

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

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

Helicopter means 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 means a heliport located on a floating or fixed offshore structure.

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

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

Instrument approach operations means 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) means 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 means 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 are considered three dimensional (3D) instrument approach

operations. CDFAs with manual calculation of the required rate of descent are considered two dimensional (2D) instrument approach operations. For more information on CDFAs, refer to PANS-OPS (ICAO Doc 8168), Volume I, Part II, Section 5.

Approach procedure with vertical guidance (APV). A performance-based navigation (PBN) instrument approach procedure designed for three dimensional (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 Section II, Chapter 2, 2.2.8.3, for instrument approach operation types.

Instrument flight rules *means a set of rules determined by the Chief Executive Officer to govern flight under conditions in which flight by outside reference cannot be complied with.*

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

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

*Note. * - As defined in CAD 2*

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

Landing decision point (LDP) means 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) means 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 means in relation an aircraft, the performance of tasks required to ensure the continuing airworthiness of the aircraft, including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair.

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

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

Master minimum equipment list (MMEL) means a list established for a particular aircraft type by the organisation 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 means maximum certificated take-off mass.

Minimum descent altitude (MDA) *or* ***minimum descent height (MDH)*** means a specified altitude or height in a two dimensional (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 2m (7ft) 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) means 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 means a change to the type design of an aeronautical product which is not a repair.

Note - A modification may also include the embodiment of the modification which is a maintenance task subject to a maintenance release. Further guidance on aircraft maintenance - modification and repair is contained in the Airworthiness Manual (ICAO Doc 9760).

Navigation specification means 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 (ICAO 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 CAD as the concept of RNP has been overtaken by the concept of PBN. The term RNP in this CAD 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 ICAO Doc 9613.

Night means the time twenty minutes after sunset and twenty minutes before sunrise, excluding both the times, determined at surface level.

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

Non-hostile environment means 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)*** means the lowest altitude or the lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria.

Note 1 - Obstacle clearance altitude is referenced to mean sea level and obstacle clearance height is referenced to the threshold elevation or in the case of non-precision approach procedures to the aerodrome elevation or the threshold elevation if that is more than 2m (7ft) 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 means 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 means an activity or group of activities which are subject to the same or similar hazards and which require a set of equipment to be specified, or the achievement and maintenance of a set of pilot competencies, to eliminate or mitigate the risk of such hazards.

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

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

Operational flight plan means the operator's plan for the safe conduct of the flight based on considerations of 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 means 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 means 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 means 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 means a manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties.

Operations specifications. means the authorisations, conditions and limitations associated with the air operator certificate and subject to the conditions in the operations manual.

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

Operator's maintenance control manual means 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) means 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) means 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) means 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 means 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 means 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 means alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine, other psychostimulants, hallucinogens, and volatile solvents, whereas coffee and tobacco are excluded.

Repair means 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 means a set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based communication.

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

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

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

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

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

Series of flights means a 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.

Note.— The terms authorization, specific approval, approval and acceptance are further described in Attachment D.

State of Design means the State having jurisdiction over the organisation responsible for the type design**.**

State of Registry means 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 (ICAO Doc 9587).

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

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

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

State of the principal location of a general aviation operator. The State in which the operator of a general aviation aircraft has its principal place of business or, if there is no such place of business, its permanent residence.

Note.— Guidance concerning the options for the principal location of a general aviation operator is contained in the Manual on the Implementation of Article 83 *bis* of the Convention on International Civil Aviation *(Doc* 10059*).*

Synthetic vision system (SVS) means 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 means that part of the flight from the start of take-off to 300m (1000ft) 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) means 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) means meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling*, equal to or better than specified minima in accordance with visual flight rules

Note - The specified minima are contained in Chapter 4 of CAD 2.

*Note. * - As defined in CAD 2.*

Visual flight rules *means a set of rules determined by the Chief Executive Officer to govern flight under conditions in which outside visual reference can be complied with.*

V_{TOSS} means 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.

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CAD 6 - PART 3

HELICOPTER

SECTION II

COMMERCIAL AIR TRANSPORT

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1 Section II – Commercial Air Transport

1.1 Compliance with laws, regulations and procedures

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

1.1.2 The operator 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.

1.1.3 The operator or a designated representative shall have responsibility for operational control.

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

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.

Note.- Guidance on the operational control organisation and the role of the flight operations officer/flight dispatcher is contained in the Manual of Procedures for Operations Inspection, Certification and Continued Surveillance (ICAO Doc 8335). Detailed guidance on the authorisation, duties and responsibilities of the flight operations officer/flight dispatcher is contained in the manual Preparation of an Operations Manual (ICAO Doc 9376). The requirements for age, skill, knowledge and experience for licenced flight operations officers/flight dispatchers are contained in CAD 1.

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 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. The flight operations officer/flight dispatch shall:

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

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

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 CAAM. Such reports shall be submitted as soon as possible and normally within ten days.

1.1.6.1 In the event that the pilot-in-command is incapable of providing such notification, this task shall be undertaken by any other member of the crew if they are able to do so, note being taken of the succession of command specified by the operator.

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

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

1.1.8 Operators shall ensure that flight crew members demonstrate the ability to speak and understand the English language as used for radiotelephony communications as specified in CAD 1.

1.2 Compliance by a foreign operator with laws, regulations and procedures of CAAM

1.2.1 All foreign operators operating in the territory and airspace (Flight Information Region (FIR)) of Malaysia shall be subject to safety oversight by the CAAM.

1.2.1.1 A foreign operator that intends to operate commercial flights into Malaysia must first be registered and be issued with a Foreign Air Operator Certificate (FAOC). An application for registration as a FAOC must be submitted no later than 90 days prior to the intended commencement of operations into Malaysia. The FAOC shall remain valid for a period of one year.

1.2.2 When conducting operations into Malaysia, the obligations of the Foreign Operators include the following:

f) Compliance with the Laws of Malaysia and application publications such as the MCAR, related provisions of CADs, Malaysian AIP, Safety Alerts and Notices.

g) Granting Inspectors from the CAAM permission to board an aircraft without notice to undertake review of relevant licenses and authorisations carried on-board and to carry out a ramp inspection.

h) Reporting to the CAAM any air safety incident or occurrence which arises within the Malaysian FIR.

i) Carrying on-board the aircraft copies of the AOC, the Operations Specifications with a valid insurance certificate and meeting the minimum requirements as set out in CAD 1, 6, 8, 13, 18 and 19.

1.2.3 Ramp inspections

1.2.3.1 In respect of ramp inspection of foreign operated aircraft, if the CAAM has any findings, the CAAM may request corrective actions to be undertaken by the operator. Depending on the severity of the finding, the CAAM has the right to restrict the operations of the aircraft, ground the aircraft and/or ban the operations.

1.2.4 Crew members of Foreign Operators.

1.2.4.1 All foreign operators shall ensure that their crew members are not under the influence of any substance which may impair their capacity to perform their duties.

1.2.4.2 All crew members may be subject to testing for "psychoactive substances" whilst on duty and if a positive test is returned or a crew member refuses to submit to a test, the CAAM may impose a range of sanctions including grounding the aircraft or prosecution.

1.2.5 CAAM approvals are required for activities involving foreign registered aircraft in the territory and airspace of Malaysia.

1.2.6 When CAAM identifies a case of non-compliance or suspected non-compliance by a foreign operator with laws, regulations and procedures applicable within Malaysia, or a similar serious safety issue with that operator, the operator shall be immediately notified by the CAAM and, if the issue warrants it, the State of the Operator. Where the State of the Operator and the State of Registry are different, such notification shall also be made to the State of Registry, if the issue falls within the responsibilities of that State and warrants a notification.

1.2.7 In the case of notification to States as specified in Paragraph 1.7.6, if the issue and its resolution warrant it, the State of the Operator and the State of Registry shall be engaged by the CAAM, as applicable, concerning the safety standards maintained by the operator.

1.3 Safety management

Note.- CAD 19 includes safety management provisions for air operators. Further guidance is contained in the Safety Management Manual (SMM) (ICAO Doc 9859).

1.3.1 The operator of a helicopter of a certified take-off mass in excess of 7000kg or having a passenger seating configuration of more than 9 and fitted with a flight

data recorder shall establish and maintain a flight data analysis programme as part of its safety management system.

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

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 CAD 19.

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

1.3.3 The use of recordings or transcripts of CVR, CARS, Class A AIR and Class A AIRS for purposes other than the investigation of an accident or incident, shall not be allowed, except where the recordings or transcripts are:

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

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

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

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

1.3.4 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 Air Accident Investigation Policy and Procedure Manual, shall not be allowed, except where the recordings or transcripts are subject to the protections accorded by CAD 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 CAD;

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.

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

Note - Guidance on the development and organisation of a flight safety documents system is provided in Attachment E of this CAD.

1.4 Dangerous goods

Note 1 - Provisions for carriage of dangerous goods are contained in CAD 18.

Note 2.- Article 35 of the Convention refers to certain classes of cargo restrictions.

1.4.1 The pilot-in-command shall take all reasonable measures to prevent dangerous goods from being carried on board inadvertently.

1.4.2 The pilot-in-command shall, in accordance with the Technical Instructions, report without delay to the CAAM and the appropriate authority of the State of occurrence in the event of any dangerous goods accidents or incidents.

1.4.3 The pilot-in-command shall ensure that passengers are provided with information about dangerous goods in accordance with the Technical Instructions.

1.4.4 Reasonable quantities of articles and substances that would otherwise be classified as dangerous goods and that are used to facilitate flight safety, where carriage aboard the aircraft is advisable to ensure their timely availability for operational purposes, shall be considered authorised under paragraph 1;2.2.1(a) of the Technical Instructions. This is regardless of whether or not such articles and substances are required to be carried or intended to be used in connection with a particular flight.

1.4.5 The packing and loading on board of the above-mentioned articles and substances shall be performed, under the responsibility of the pilot-in-command, in such a way as to minimise the risks posed to crew members, passengers, cargo or the aircraft during aircraft operations.

1.5 Use of psychoactive substances

1.5.1 No person whose function is critical to the safety of aviation (safety-sensitive personnel) shall undertake that function while under the influence of any psychoactive substance, by reason of which human performance is impaired. No such person shall engage in any kind of problematic use of substances.

Note.- Provisions concerning the use of psychoactive substances are contained in CAD 1, 1.2.7 and CAD 2, 2.5.

1.6 Specific approvals

1.6.1 The pilot-in-command shall not conduct operations for which a specific approval is required unless such approval has been issued by the State of Registry. Specific approvals shall follow the layout and contain at least the information listed in Appendix 5.

1.6.2 Operations which require a specific approval are:

a) Night Vision Imaging System (NVIS);

b) Helicopter Hoist Operations (HHO);

c) Helicopter Emergency Medical Service (HEMS)

d) Helicopter Offshore Operations (HOFO)

e) Electronic Flight Bags (EFBs);

f) Performance Based Navigation (PBN);

g) Low Visibility Operations (LVO).

2 Flight Operations

2.1 Operating facilities

2.1.1 The operator shall ensure that a flight will not be commenced unless it has been ascertained by every reasonable means available that the ground and/or water facilities available and directly required on such flight, for the safe operation of 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.

Note - "Reasonable means" in this Directive is intended to denote the use, at the point of departure, of information available to the operator either through official information published by the aeronautical information services or readily obtainable from other sources.

2.1.2 The operator shall ensure that any inadequacy of facilities observed in the course of operations is reported to the authority responsible for them, without undue delay.

2.1.3 These facilities shall be located at the main base and other locations where the operator is operating. The buildings to be utilised by the operator at each base and terminal, shall be properly equipped.

2.1.4 The buildings shall accommodate the necessary sanitary facilities and security and emergency controls, warnings and equipment; and are adequate for the operation to be conducted.

2.1.5 The operator's facilities, equipment and support services necessary for the safe operation of the helicopter shall include, but not limited, to the following:

a) Helicopter.

b) Airport and stations facilities.

c) Communication facilities and equipment.

d) Office accommodation and storage facilities.

e) Hangars.

f) Maintenance and Overhaul workshops.

g) Operations and dispatch facilities.

h) Load control facilities.

i) Passenger service areas and handling facilities (if applicable).

j) Cargo storage and handling facilities (if applicable).

k) Training facilities.

l) Other ground handling facilities.

m) Rescue and firefighting facilities.

2.2 Operational certification and supervision

2.2.1 The air operator certificate

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

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

Note.— Provisions for the content of the air operator certificate and its associated operations specifications are contained in CAD 6004 – AOC.

2.2.1.3 The issue of an air operator certificate by the shall be dependent upon the operator 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.

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

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

2.2.1.5 The air operator certificate shall contain at least the following information and shall follow the layout of Appendix 3, paragraph 2:

Note. – Details on the AOC template can be found in Attachment C of the CAGM 6004 – AOC.

2.2.1.6 The operations specifications associated with the air operator certificate shall contain at least the information listed in Appendix 3, paragraph 3, and shall follow the layout of Appendix 3, paragraph 3.

Note. – Attachment D, paragraph 3.2.2, contains additional information that may be listed in the operations specifications associated with the air operator certificate.

2.2.1.7 Air operator certificates and their associated operations specifications first issued from 20 November 2008 shall follow the layouts of Appendix 3, paragraphs 2 and 3.

2.2.2 Surveillance of operations by a foreign operator

2.2.2.1 CAAM will recognise as valid an air operator certificate issued by another Contracting State provided that the requirements under which the certificate was issued are at least equal to the applicable Standards specified in this CAD.

2.2.2.2 The operator shall meet and maintain the requirements established by the States in which the operations are conducted.

Note.- Guidance on the surveillance of operations by foreign operators may be found in the Manual of Procedures for Operations Inspection, Certification and Continued Surveillance (ICAO Doc 8335).

2.2.3 Operations manual

2.2.3.1 The operator shall provide for the use and guidance of operations personnel concerned, an operations manual constructed using the guidance contained in Appendix 8. 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 CAAM requires the operator to provide a copy of the operations manual together with all amendments and/or revisions, for review and acceptance and, where required, approval. The operator shall incorporate in the operations manual such mandatory material as CAAM may require.

Note 1.- Guidance for the organisation and contents of an operations manual is provided in Appendix 8.

Note 2.- Specific items in an operations manual require the approval of the State of the Operator in accordance with the Standards in 2.2.8, 4.1.3, 7.3.1, 10.3 and 11.2.1.

2.2.4 Operating instructions – general

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

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 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 should be based on the helicopter

manufacturer's or other data, acceptable to CAAM and should be included in the operations manual.

2.2.5 In-flight simulations of emergency situations

2.2.5.1 The operator shall ensure that when passengers or cargo are being carried, no emergency or abnormal situations requiring the application of part or all of abnormal or emergency procedures and simulation of IMC by artificial means, are not simulated.

2.2.5.2 These procedures shall be included in the Operations Manual Part D – Training.

2.2.6 Checklists

2.2.6.1 The checklists provided in accordance with 4.1.4 shall 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 helicopter flight manual or other documents associated with the certificate of airworthiness and otherwise in the operations manual. The design and utilisation of checklists shall observe Human Factors principles.

Note - Guidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (ICAO Doc 9683).

2.2.7 Minimum flight altitudes (operations under IFR)

2.2.7.1 The operator shall establish minimum flight altitudes for those routes flown for which minimum flight altitudes have been established by the State flown over or the responsible state, provided that they shall not be less than those established by that State, unless specifically approved.

2.2.7.2 The operator 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 CAAM, 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 CAD 2.

2.2.7.3 The method for establishing the minimum flight altitudes shall be approved by the CAAM. Where the minimum flight altitudes established by the operator and a State overflown differ, the higher values shall apply.

2.2.7.4 An operator when establishing the minimum flight altitudes, shall take into consideration the probable effects of the following factors on the safety of the operation in question:

a) the accuracy and reliability with which the position of the helicopter can be determined;

b) the inaccuracies in the indications of the altimeters used;

c) the characteristics of the terrain (e.g. sudden changes in the elevation);

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

e) possible inaccuracies in aeronautical charts; and

f) airspace restrictions.

2.2.7.5 In fulfilling the requirements prescribed in sub-paragraph 2.2.7.4 above due consideration shall be given to:

a) Corrections for temperature and pressure variations from standard values.

b) The ATC requirements; and

c) Any contingencies along the planned route.

2.2.7.6 The pilot flying shall not descend below specified minimum altitudes except when necessary for take-off or landing, or when descending in accordance with procedures approved by the CAAM.

2.2.8 Heliport or landing location operating minima

2.2.8.1 CAAM requires that the operator establish operating minima for each heliport or landing location to be used in operations and shall approve the method of determination of such minima. Such minima shall not be lower than any that may be established for such heliports or landing locations by the State of the Aerodrome, except when specifically approved by that State.

Note1.- This Standard does not require the State of the Aerodrome to establish operating minima.

Note2.- The above paragraph does not prohibit in-flight calculation of minima for a non-planned alternate heliport if carried out in accordance with an accepted method.

2.2.8.1.1 CAAM may approve operational credit(s) for operations with helicopters equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS. Such approvals shall not affect the classification of the instrument approach procedure.

Note 1.- 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.

Note 2.- Guidance on operational credit for aircraft equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS and CVS is contained in Attachment G and in the Manual of All-Weather Operations (ICAO Doc 9365).

Note 3.- Information regarding a HUD or equivalent displays, including references to RTCA and EUROCAE documents, is contained in the Manual of All-Weather Operations (ICAO Doc 9365).

Note 4.- 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.

2.2.8.2 In establishing the operating minima for each heliport or landing location which will apply to any particular operation, full account shall be taken of:

a) the type, performance and handling characteristics of the helicopter;

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

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

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

e) the equipment available on the helicopter for the purpose of navigation, acquisition of visual references and/or control of the flight path during the approach, landing and 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; and

h) the obstacles in the climb-out areas and necessary clearance margins.

2.2.8.2.1 The operator shall specify the method of determining the in the operations manual.

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

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

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

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

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

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

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

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

Note 3 - 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 (ICAO Doc 9365).

2.2.8.4 Category II and Category III instrument approach operations shall not be authorised unless RVR information is provided.

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

Note.- Guidance on the operationally desirable and currently attainable accuracy of measurement or observation is given in CAD 3, Attachment B.

2.2.8.6 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 (ICAO Doc 8168) Volume I, Part II, Section 5.

2.2.8.7 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.

2.2.9 Fuel and oil records

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

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

2.2.9.3 The operator shall also establish records on the measurement and distribution of the fluid carried on board. Such instructions should take account of all circumstances likely to be encountered on the flight, including the possibility of in-flight re-planning and of failure of one or more of the aircraft's power plants.

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 The composition of the flight crew and the number of flight crew members at designated crew stations are both in compliance with, and no less than the minimum specified in, the Helicopter Flight Manual.

2.2.10.3 The flight crew includes additional flight crew members when required by the type of operation, and is not reduced below the number specified in the Operations Manual.

2.2.10.4 All flight crew members hold an applicable and valid licence acceptable to the CAAM and are suitably qualified and competent to conduct the duties assigned to them.

2.2.10.5 Procedures are established, acceptable to the CAAM, to prevent the crewing together of inexperienced flight crew members.

2.2.11 Passengers

2.2.11.1 The operator 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 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 The operator shall ensure that in an emergency during flight, passengers are instructed in such emergency action as may be appropriate to the circumstances.

2.2.11.4 The operator 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 their seats by means of the seat belts or harnesses provided.

2.2.11.5 The operator shall establish procedures to ensure that passengers are seated where, in the event that an emergency evacuation is required, they are able to assist and not hinder evacuation of the aircraft.

2.2.11.6 The operator shall make provisions for multiple occupancy of aircraft seats that is only allowed on specified seats. The pilot-in-command shall be satisfied that multiple occupancy does not occur other than by one adult and one infant who is properly secured by a supplementary loop belt or other restraint device.

2.2.11.7 The operator shall determine the frequency of briefings or reminding passengers about the smoking regulations.

2.2.12 Over-water flights

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

2.2.12.2 An operator shall not operate a helicopter in Performance Class 1 or 2 on a flight over water in a hostile environment at a distance from land corresponding to more than 10 minutes flying time at normal cruise speed unless that helicopter is so designed for landing on water or is certificated in accordance with ditching provisions.

2.2.12.3 An operator shall not operate a helicopter in Performance Class 1 or 2 on a flight over water in a non-hostile environment at a distance from land corresponding to more than 10 minutes flying time at normal cruise speed unless that helicopter is; so designed for landing on water; or is certificated in accordance with ditching provisions; or is fitted with emergency flotation equipment.

2.2.12.4 An operator shall not operate a helicopter in Performance Class 2, when taking-off or landing over water, unless that helicopter is; so designed for landing on water; or is certificated in accordance with ditching provisions; or is fitted with emergency floatation equipment. Except where, for the purpose of minimising

exposure, the landing or take-off at a HEMS operating site located in a congested environment is conducted over water – unless otherwise required by the CAAM.

2.2.12.5 An operator shall not operate a helicopter in Performance Class 3 on a flight over water beyond safe forced landing distance from land unless that helicopter is; so designed for landing on water; or is certificated in accordance with ditching provisions; or is fitted with emergency flotation equipment.

2.2.13 Weather and sea state both affect the outcome of an autorotation following an engine failure. It is recognised that the measurement of sea state is problematical and when assessing such conditions, good judgement has to be exercised by the operator and the pilot-in-command.

2.2.14 The pilot-in-command shall, for determining the risk, take the following operating environment and conditions into account:

a) sea state

b) sea and air temperatures

c) the distance from land suitable for making an emergency landing; and

d) the availability of search and rescue facilities.

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, for the particular type of operation to be undertaken, are installed and are sufficient for the flight;

c) a maintenance release as prescribed in 6.7 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 can be complied with for the flight to be undertaken; and

g) the Directives of 2.3.3 relating to operational flight planning have been complied with.

h) The provisions specified in the operations manual in respect of fuel, oil and oxygen requirements, minimum safe altitudes, heliport operating minima and

availability of alternate heliports, where required, can be complied with for the planned flight.

i) Those parts of the operations manual which are required for the conduct of the flight are available.

j) The documents, additional information and forms required to be available are on board.

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

l) The helicopter configuration is in accordance with the Configuration Deviation List (CDL).

m) The helicopter and its equipment is in operable condition except as provided in the Minimum Equipment List.

n) Any operational limitation in addition to those covered by (d) and (h) above can be complied with.

2.3.2 The operator shall ensure that the following completed flight preparation forms used for the preparation and execution of a flight, and associated reports are kept for a period of three months:

a) the operational flight plan, if applicable.

b) route-specific notice(s) to airmen (NOTAM) and aeronautical information services (AIS) briefing documentation, if edited by the operator.

c) mass and balance documentation.

d) notification of special loads, including written information to the pilot-in-command about dangerous goods, if applicable.

e) the journey log, or equivalent; and

f) flight report(s) for recording details of any occurrence, or any event that the pilot-in-command deems necessary to report or record.

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 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 operations manual shall describe the content and use of the operational flight plan.

2.3.3.3 The operator must ensure that the operational flight plan used and the entries made during flight contain the following items:

a) Helicopter registration.

b) Helicopter type and variant.

c) Date of flight.

d) Flight identification.

e) Names of flight crew members.

f) Duty assignment of flight crew members.

g) Place of departure.

h) Time of departure.

i) Place of arrival (planned and actual).

j) Time of arrival.

k) Type of operation (VFR, HEMS, etc.).

l) Route and route segments with checkpoints/waypoints, distances, time and tracks.

m) Planned cruising speed and flying times between check-points/way-points. Estimated and actual times overhead.

n) Safe altitudes and minimum levels.

o) Planned altitudes and flight levels.

p) Fuel calculations (records of in-flight fuel checks).

q) Fuel on board when starting engines.

r) Alternate(s) for destination and, where applicable, take-off and en-route, including information required in (l), (m), (n), and (o) above.

s) Initial ATS Flight Plan clearance and subsequent re-clearance.

t) In-flight re-planning calculations; and

u) Relevant meteorological information.

2.3.3.4 Items which are readily available in other documentation or from an acceptable source or are irrelevant to the type of operation may be omitted from the operational flight plan.

2.3.3.5 The operator shall ensure that all entries on the operational flight plan are made concurrently and that they are permanent in nature.

2.3.3.6 Notwithstanding 2.3.3.1, an operational flight plan is not required for operations under VFR of helicopters with an MCTOM of 3 175 kg or less, by day and over routes navigated by reference to visual landmarks in a local area as specified in the operations manual.

2.3.4 Alternate heliports

2.3.4.1 Take-off alternate heliport

2.3.4.1.1 A take-off alternate heliport or landing site 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.

2.3.4.1.2 For a heliport or landing site to be selected as a take-off alternate, the appropriate weather reports and/or forecasts indicate that, during a period commencing one hour before and ending one hour after the estimated time of arrival at the take-off alternate aerodrome, the weather conditions will be at or above the applicable landing minima.

2.3.4.1.3 The ceiling shall be taken into account when the only approach operations available are NPA operations. Any limitation related to OEI operations shall be taken into account.

2.3.4.1.4 The pilot-in-command must select a take-off alternate within one-hour flight time at normal cruise speed for a flight under IMC if he would not be possible to return to the heliport of departure due to meteorological reasons.

2.3.4.2 Destination alternate heliport

2.3.4.2.1 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:

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

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

2.3.4.2.2 For a heliport to be selected as a destination alternate, the available information shall indicate that, during a period commencing one hour before and ending one hour after the estimated time of arrival at the destination aerodrome, the conditions will be at or above the heliport operating minima for that operation.

2.3.4.2.3 For a flight departing to a destination which is forecast to be below the heliport operating minima, or if no meteorological information is available at the destination aerodrome, two destination alternates shall be selected. The first destination alternate shall 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 offshore alternate heliport is specified, it shall be specified subject to the following:

a) the offshore alternate heliport shall be used only after a PNR. Prior to a PNR, onshore alternate heliports 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 alternate heliport(s);

c) one engine inoperative performance capability shall be attainable prior to arrival at the alternate heliport;

d) to the extent possible, deck availability shall be guaranteed; and

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

2.3.4.5 Planning minima for destination aerodrome and destination alternate aerodrome(s).

2.3.4.5.1 The operator shall only select the destination and/or destination alternate aerodrome(s) when the appropriate weather reports and/or forecasts indicate that, during a period commencing one hour before and ending one hour after the estimated time of arrival at the aerodrome or operating site, the weather conditions will be at or above the applicable planning minima as follows:

a) planning minima for a destination aerodrome shall be:

1) RVR/VIS specified in accordance with 2.2.8, and

2) for NPA operations, the ceiling at or above MDH.

b) planning minima for destination alternate aerodrome(s) are as shown in Table 1.

Table 1

Planning minima destination alternate aerodrome

Type of approach	Planning minima
CAT II and III	CAT I RVR
CAT I	CAT I + 200 ft/400 m visibility
NPA	NPA RVR/VIS + 400 m Ceiling shall be at or above MDH + 200 ft

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.

2.3.5.1.1 On VFR flights overwater out of sight of land with helicopters, the pilot-in-command shall only commence take-off when the appropriate weather reports and/or forecasts indicate that the cloud ceiling will be above 600 ft by day or 1 200 ft by night.

Note.- When a flight is conducted in accordance with VFR, the use of night vision imaging systems (NVIS) or other vision enhancing systems does not diminish the requirement to comply with the provisions of 2.3.5.1.

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 CAAM, to be added to the operator's established heliport or landing location operating minima.

2.3.5.3.1 A flight to a helideck or elevated heliport shall not be operated when the mean wind speed at the helideck or elevated heliport is reported as 60 knots or more.

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

2.3.5.5.1 The operator, where deemed necessary, shall establish procedures to be followed when ground de-icing and anti-icing and related inspections of the helicopter(s) are required.

2.3.5.5.2 A pilot-in-command shall not commence take-off unless the external surfaces are clear of any deposit which might adversely affect the performance and/or controllability of the helicopter except as permitted in the Helicopter Flight Manual.

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

2.3.6 Fuel and oil requirements

2.3.6.1 For 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 An operator shall base the company fuel policy, including calculation of the amount of fuel to be carried, on the following planning criteria.

2.3.6.2.1 The amount of:

a) Taxi fuel, which shall not be less than the amount, expected to be used prior to take-off. Local conditions at the departure heliport and APU consumption should be taken into account.

b) Trip fuel, which shall include:

1) Fuel for take-off and climb from heliport elevation to initial cruising level/altitude, taking into account the expected departure routing.

2) Fuel from top of climb to top of descent, including any step climb/descent;

3) Fuel from top of descent to the point where the approach procedure is initiated, taking into account the expected arrival procedure; and

4) Fuel for approach and landing at the destination heliport.

c) Contingency fuel, which shall be:

1) For IFR flights, or for VFR flights in a hostile environment, 10% of the planned trip fuel; or

2) For VFR flights in a non-hostile environment, 5% of the planned trip fuel.

d) Alternate fuel, which shall be:

1) Fuel for a missed approach from the applicable MDA/DH at the destination heliport to missed approach altitude, taking into account the complete missed approach procedure.

2) Fuel for a climb from missed approach altitude to cruising level/altitude.

3) Fuel for the cruise from top of climb to top of descent.

4) Fuel for descent from top of descent to the point where the approach is initiated, taking into account the expected arrival procedure; and

5) Fuel for executing an approach and landing at the destination alternate heliport selected in accordance with the provisions in 2.3.4.

6) For helicopters operating to or from helidecks located in a hostile environment, 10% of a. to e. above.

e) Final reserve fuel, which shall be:

1) For VFR flights navigating by day with reference to visual landmarks, 20 minutes fuel at best range speed; or

2) For IFR flights or when flying VFR and navigating by means other than by reference to visual landmarks or at night, fuel to fly for 30 minutes at holding speed at 1500 ft (450 m) above the destination heliport in standard conditions calculated with the estimated mass on arrival above the alternate, or the destination, when no alternate is required.

f) Extra fuel, which should be at the discretion of the pilot-in-command.

2.3.6.2.2 Isolated heliport IFR procedure. If an operator's fuel policy includes planning to an isolated heliport flying IFR, or when flying VFR and navigating by means other than by reference to visual landmarks, for which a destination alternate does not exist, the amount of fuel at departure should include:

a) Taxi fuel.

b) Trip fuel.

c) Contingency fuel calculated in accordance with sub-paragraph 2.3.6.2.1 c) above.

d) Additional fuel to fly for two hours at holding speed including final reserve fuel; and

e) Extra fuel at the discretion of the pilot-in-command.

2.3.6.2.3 Sufficient fuel should be carried at all times to ensure that following the failure of a power unit which occurs at the most critical point along the route, the helicopter is able to:

a) Descend as necessary and proceed to an adequate heliport; and

b) Hold there for 15 minutes at 1500 ft (450 m) above heliport elevation in standard conditions; and

c) Make an approach and landing.

2.3.6.2.4 At the planning stage, not all factors which could have an influence on the fuel consumption to the destination heliport can be foreseen. Therefore, contingency fuel is carried to compensate for items such as:

a) Deviations of an individual helicopter from the expected fuel consumption data.

b) Deviations from forecast meteorological conditions; and

c) Deviations from planned routings and/or cruising levels/altitudes.

2.3.6.3 In computing the fuel and oil required in 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 pressurisation, 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.

2.3.6.4 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 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 refuelling;

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 refuelling and the qualified personnel on board the helicopter; and

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

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.

d) Fasten seat belts sign must be off

e) No smoking sign must be on together with interior lighting to enable emergency exits to be identified.

2.3.7.3 The operator shall establish procedures and specify conditions under which such refuelling 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 HFM;

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

2.3.7.6 A 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 refuelling are contained in CAD 14, Volume I, and guidance on safe refuelling practices is contained in the Airport Services Manual (ICAO Doc 9137), Parts 1 and 8.

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

2.3.8 Oxygen supply

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

Absolute pressure	*Meters*	*Feet*
700hPa	*3000*	*10000*
620hPa	*4000*	*13000*
376hPa	*7600*	*25000*

2.3.8.1 Non-pressurised helicopters operated at pressure altitudes above 10000 ft shall be equipped with supplemental oxygen equipment capable of storing and dispensing the oxygen supplies in accordance with the following tables.

Table 2: Oxygen minimum requirements for complex non-pressurised helicopters

Supply for	**Duration and cabin pressure altitude**
1. Occupants of flight crew compartment seats on flight crew compartment duty and crew members assisting flight crew in their duties	The entire flying time at pressure altitudes above 10,000 ft.

2. Required cabin crew members	The entire flying time at pressure altitudes above 13,000 ft and for any period exceeding 30 minutes at pressure altitudes above 10,000 ft but not exceeding 13,000 ft.
3. Additional crew members and 100 % of passengers (1)	The entire flying time at pressure altitudes above 13,000 ft.
4. 10 % of passengers (1)	The entire flying time after 30 minutes at pressure altitudes above 10,000 ft but not exceeding 13,000ft.
(1) Passenger numbers in Table 2 refer to passengers actually carried on board including persons younger than 24 months.	

Table 3: Oxygen minimum requirements for other-than-complex non-pressurised helicopters

Supply for	Duration and cabin pressure altitude
1. Occupants of flight crew compartment seats on flight crew compartment duty, crew members assisting flight crew in their duties, and required cabin crew members	The entire flying time at pressure altitudes above 13,000 ft and for any period exceeding 30 minutes at pressure altitudes above 10,000 ft but not exceeding 13,000 ft.
2. Additional crew members and 100 % of passengers (1)	The entire flying time at pressure altitudes above13,000 ft.
3. 10 % of passengers (1)	The entire flying time after 30 minutes at pressure altitudes above 10,000 ft but not exceeding 13,000 ft.
(1) Passenger numbers in Table 3 refer to passengers actually carried on board including persons younger than 24 months	

2.3.8.2 A flight to be operated with a pressurised helicopter shall not be commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all the crew members and passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurisation, for any period that the pressure altitude in any compartment occupied by them would be more than 10000 ft. In addition, when the helicopter is operated at flight altitudes at which the pressure altitude is less than 25000 ft and cannot descend safely to a flight altitude at which the atmospheric pressure is equal to 13000 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 destination alternate heliport, in compliance with the operating minima established in accordance with 2.2.8.1.

2.4.1.2 An instrument approach shall not be continued below 300m (1000ft) 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 (ICAO Doc 8168), Volume II.

2.4.1.3 If, after entering the final approach segment or after descending below 300m (1000ft) 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

Note.- The procedures for making meteorological observations on board aircraft in flight and for recording and reporting them are contained in CAD 3, the PANS-ATM (ICAO Doc 4444) and the appropriate Regional Supplementary Procedures (ICAO Doc 7030).

2.4.2.1 When the use of an Offshore Alternate is planned, the meteorological observations at the destination and alternate should be taken by an Observer acceptable to the authority responsible for the provision of meteorological services. Automatic meteorological observations stations may be used if acceptable.

2.4.3 Hazardous flight conditions

2.4.3.1 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 so rendered shall give such details as may be pertinent to the safety of other aircraft.

2.4.4 Flight crew members at duty stations

2.4.4.1 Taxi, take-off and landing. All flight crew members required to be on flight deck duty shall be at their stations.

2.4.4.1.1 During all phases of flight each flight crew member required to be on duty in the flight crew compartment shall remain alert. If a lack of alertness is encountered, appropriate countermeasures shall be used. If unexpected fatigue is experienced, a controlled rest procedure, organised by the pilot-in-command, may be used if workload permits. Controlled rest taken in this way shall not be considered to be part of a rest period for purposes of calculating flight time limitations nor used to justify any extension of the duty period.

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, provided at least one suitably qualified pilot remains at the controls of the helicopter at all times.

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 taxi, take-off and landing phases; all other flight crew members shall keep their safety harness fastened during the taxi, 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

2.4.5.1 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 2.3.8.1 or 2.3.8.2.

2.4.6 Safeguarding of cabin crew and passengers in pressurised aircraft in the event of loss of pressurisation

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

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

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 utilised 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 Malaysia.

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

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

Note 2 - Criteria for the construction of instrument flight procedures for the guidance of procedure specialists are provided in PANS-OPS (ICAO Doc 8168), Volume II. Obstacle clearance criteria and procedures used in certain States may differ from PANS-OPS, and knowledge of these differences is important for safety reasons (see SectionII, Chapter 1, 1.1.1).

2.4.8 Helicopter operating procedures for noise abatement

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

2.4.8.1.1 The procedures should:

a) ensure that safety has priority over noise abatement; and

b) be simple and safe to operate with no significant increase in crew workload during critical phases of flight.

2.4.8.2 The pilot-in-command when required by the procedures, shall take into account published noise abatement procedures to minimise the effect of aircraft noise while ensuring that safety has priority over noise abatement.

2.4.9 In-flight fuel management

2.4.9.1 The operator shall establish policies and procedures, approved by CAAM, to ensure that inflight 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 CAD 10, Volume II, 5.3.2.1.1, b) 3.

2.4.9.5 The operator shall establish a procedure to ensure that in-flight fuel checks and fuel management are carried out.

2.4.9.6 The pilot-in-command shall ensure that the amount of usable fuel remaining in flight is not less than the fuel required to proceed to an aerodrome or operating site where a safe landing can be made, with final reserve fuel remaining.

2.4.9.7 The pilot-in-command shall declare an emergency when the actual usable fuel on board is less than final reserve fuel.

2.5 Duties of pilot-in-command

2.5.1 An operator shall specify the responsibilities and duties of the pilot-in-command in its OM including, but not limited to the following:

a) Be responsible for the safe operation of the helicopter and safety of its occupants when the rotors are turning;

b) Have authority to give all commands he deems necessary for the purpose of securing the safety of the helicopter and of persons, property and cargo carried therein;

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

d) Not allow a person to be carried in the helicopter who appears to be under the influence of alcohol, drugs and/or psychoactive substance to the extent that the safety of the helicopter or its occupants is likely to be endangered;

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

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

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

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

i) Not permit:

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

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

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

l) be satisfied that relevant emergency equipment remains easily accessible for immediate use.

2.5.2 The pilot-in-command shall ensure that the checklists specified in 2.2.6 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.

a) The pilot-in-command shall submit a report to the CAAM of any incident that endangers or could endanger the safety of the operation.

b) Reports shall be despatched within 48 hours of the time when the incident was identified unless exceptional circumstances prevent this.

Note.- A definition of the term "serious injury" is contained in CAD 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 9.4.1.

2.5.6 The pilot-in-command, or the pilot to whom conduct of the flight has been delegated, shall, in an emergency situation that requires immediate decision and action, take any action he considers necessary under the circumstances in accordance Reg. 77 MCAR. In such cases he may deviate from rules, operational procedures and methods in the interest of safety.

2.5.7 Whenever an aircraft in flight has maneuvered in response to an airborne collision avoidance system (ACAS) resolution advisory (RA), the pilot-in-command shall submit an ACAS report to CAAM.

2.5.8 Bird hazards and strikes:

a) Whenever a potential bird hazard is observed, the pilot-in-command shall inform the air traffic service (ATS) unit as soon as flight crew workload allows.

b) Whenever an aircraft for which the pilot-in-command is responsible suffers a bird strike that results in significant damage to the aircraft or the loss or malfunction of any essential service, the pilot-in-command shall submit a written bird strike report after landing to CAAM.

Note - By virtue of Resolution A10-36 of the Tenth Session of the Assembly (Caracas, June–July 1956) "the general declaration, [described in CAD 9] when prepared so as to contain all the information required by Article 34 [of the Convention on International Civil Aviation] with respect to the journey log book, may be considered by Contracting States to be an acceptable form of journey log book".

2.6 Duties of flight operations officer/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 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; and

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; and

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

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

2.7 Carry-on baggage

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

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

2.8 Fatigue management

2.8.1 An operator shall ensure that the directive on fatigue management establish by - the CAAM are complied with. These directives which are based upon scientific principles, knowledge and operational experience with the aim of ensuring that flight and cabin crew members are performing at an adequate level of alertness.

2.8.2 For detail prescriptive directives for flight time, flight duty period, duty period limitations and rest period requirements to manage fatigue, refer to CAD 1901 on FTL.

2.9 Additional requirements for Low Visibility Operations (LVO)

2.9.1 An operator shall not conduct LVO unless:

a) Each aircraft concerned is certificated by the regulatory authority of the State of the Manufacturer for operations with decision heights below 200 ft, or no decision height, and accepted by CAAM or CAAM has certified the aircraft for such operations as per Chapter 3 of CAGM 6008 (III) LVO),

b) The aerodrome is approved for such operations by the State in which the aerodrome is located.

c) It has verified that low visibility procedures (LVP) have been established, and will be enforced, at those aerodromes where low visibility operations are to be conducted.

d) A suitable system for recording approach and/or automatic landing success and failure is established and maintained to monitor the overall safety of the operation;

e) The operations are approved by CAAM.

f) The flight crew consists of at least two pilots;

g) Decision height is determined by means of a radio altimeter.

h) Only RVR values are used for low visibility operations.

2.9.2 The maintenance programme shall ensure that the airborne equipment necessary for low visibility operations continues to operate to the required performance level and should cover following areas and any other requirement specified by the CAAM:

a) Maintenance procedures.

b) Maintenance and calibration of test equipment.

c) Initial and recurrent training of maintenance staff.

d) Recording and analysis of airborne equipment failures.

Note. – Details of continuing airworthiness and maintenance procedures of LVO are stated in CAGM 6008 (III) LVO.

2.9.3 Responsibilities of pilot-in-command

2.9.3.1 The pilot-in-command shall satisfy himself that:

a) The status of the visual and non-visual facilities is sufficient prior to commencing a low visibility take-off, an approach utilising EVS or a Category II or III approach;

b) Appropriate LVPs are in force according to information received from Air Traffic Services, before commencing a low visibility take-off or a Category II or III approach; and

c) The flight crew members are properly qualified prior to commencing a low visibility take-off in an RVR of less than 150 m (200 m for Category D aircrafts), an approach utilising EVS or a Category II or III approach.

d) The operator has appropriate authorisation from the state of registry and the state of aerodrome to carry out a low visibility take-off or a Category II or III approach to the aerodrome intended.

e) The aircraft is properly certified and all required equipment are serviceable for the intended low visibility take-off or a Category II or III approach (refer to paragraph 2.9.4)

2.9.4 Minimum equipment

2.9.4.1 The operator shall include in the Operations Manual the minimum equipment that has to be serviceable at the commencement of a low visibility take-off, an approach utilising EVS, or a Category II or III approach in accordance with the AFM or other approved document.

2.9.4.2 The operator shall have procedures to indicate to the flight crew / Flight operations officer the status of the aircraft when the aircraft is upgraded/degraded due to any un-serviceability as per paragraph 2.9.4.1or any other reason.

2.9.4.3 The pilot-in-command shall satisfy himself the status of the aircraft and of the relevant airborne systems is appropriate for the specific operation to be conducted prior to departure.

2.9.5 Pilot qualifications

2.9.5.1 The operator shall ensure that each flight crew member completes training and a check outlined in CAGM 6008 (III) LVO before being authorised to conduct LVTO, Category II or III operations.

2.9.5.2 The flight crew qualifications as per above paragraph 2.9.5.1 are specific to the operator and the type of aircraft in which the qualification obtained.

2.9.6 Crew training

2.9.6.1 An operator shall ensure that, prior to conducting Category II and III operations or approaches utilising EVS:

a) Each flight crew member completes the training and checking guidelines prescribed in CAGM 6008 (III) LVO including FSTD training in operating to the limiting values of RVR and Decision Height appropriate to the operator's approval.

b) The training and checking is conducted in accordance with a detailed syllabus approved by the CAAM and included in the Operations Manual. This training is in addition to the training requirement for type qualifications.

2.9.6.2 An operator shall ensure that flight crew member training programs for low visibility operations include structured courses of ground and FSTD training.

2.9.7 Crew training - low visibility take-off (LVTO)

2.9.7.1 Low Visibility Take-Off with RVR less than 400 m.

a) All low visibility take-off less than 400 m requires CAAM approval.

b) An operator must ensure that a flight crew member has completed a check before conducting Low Visibility Take-Offs in RVRs of less than 400 m.

c) Take-off in minimum approved RVR conditions with an engine failure for helicopters at or after take-off decision point (TDP); and

d) Take-off in minimum approved RVR conditions with an engine failure for helicopters before the TDP.

2.9.7.2 Operator using HUD/EVS equipment wishing to conduct LVTO has to obtain further approval from CAAM.

2.9.8 Recurrent training - low visibility operations

2.9.8.1 An operator shall ensure that all crew authorised for low visibility operations undergo an annual recurrent ground school training program which shall be an abbreviated training program covering requirements in paragraph 4.4.3 of the CAGM 6008 (III) LVO.

2.9.8.2 An operator shall ensure that all crew authorised for low visibility operations undergo a recurrent simulator training program in the simulator prior to the certification requirement as per paragraph 2.9.7.

2.9.8.3 Training programs required shall have the approval of the CAAM and included in the Operations manual.

2.9.9 Crew certification for Category II / Category III operations

2.9.9.1 An operator shall ensure that, prior to conducting Category II and III operations or approaches utilising EVS and conducting low visibility take off, each flight crew member completes the checking requirements prescribed in CAGM 6008 (III) LVO.

2.9.10 Flight crew records

2.9.10.1 The operator shall maintain records of all flight crew authorised to conduct low visibility operations.

2.9.10.2 The records as required as per paragraph 2.9.8.1shall;

a) Indicate initial and continued eligibility of the flight crew member to conduct LVTO, Category II / III operations

b) Minima authorised and Category of operation

c) Recency as required in paragraph 4.16 of the CAGM 6008 (III) LVO.

2.9.10.3 Each flight crew member is required to be in possession of the crew record as required in paragraph 2.9.8 when exercising the privileges authorised in this manual.

2.9.11 Flight dispatch procedure

2.9.11.1 An operator shall ensure requirements for low visibility operations shall be included in the operator flight dispatch procedures.

2.9.11.2 The Operator shall have a system to inform the flight dispatch office regarding the status of the aircraft in respect low visibility operations.

2.9.11.3 Procedures as required in paragraph 2.9.9 shall be included in the operations manual.

2.9.12 Flight operations officers

2.9.12.1 If the system of flight dispatch of the operator requires the employment of a Flight Operations Officer (FOO), the operator shall ensure that the FOO receive initial and annual recurrent training in respect of fight dispatch in connection with low visibility operations.

2.10 Helicopter Hoist Operations (HHO)

2.10.1 No operator shall operate a helicopter for the purpose of hoist operations unless with the approval by the CAAM.

2.10.2 For the purpose of obtaining an approval from the CAAM, the operator shall:

a) operate in commercial air transport and hold a valid AOC; and

b) demonstrate to CAAM compliance with the requirements contained in this Directive.

2.10.3 Equipment requirements for HHO

2.10.3.1 The operator shall ensure that the installation of all helicopter hoist equipment, including any radio equipment comply with 2.10.4.

2.10.3.2 No modifications to the aircraft shall be made, unless with the airworthiness approval.

2.10.3.3 The operator shall ensure that the ancillary equipment shall be designed and tested to the appropriate standard as required by CAAM.

2.10.3.4 The operator shall establish maintenance instructions for HHO equipment and systems in liaison with the manufacturer and included in the operator's helicopter maintenance.

2.10.4 HHO communication

2.10.4.1 The operator shall establish two-way radio communication with the organisation for which the HHO is being provided and, where possible, a means of communicating with ground personnel at the HHO site for:

a) day and night offshore operations; or

b) night onshore operations.

2.10.4.2 Notwithstanding 2.10.4.1, in the case of HHO at a helicopter emergency medical services ("HEMS") operating site, the operator shall establish two-way

radio communication with the organisation for which the HHO is being provided and two-way radio communication with ground personnel at the HHO.

2.10.5 Performance requirements for HHO

2.10.5.1 Except for HHO at a HEMS operating site, the operator shall ensure that the HHO is capable of sustaining a critical engine failure with the remaining engine(s) at the appropriate power setting without hazard to the suspended person(s)/cargo, third parties or property.

2.10.6 Crew requirements for HHO

The operator shall:

2.10.6.1 establish criteria for the selection of flight crew members for the HHO task, taking previous experience into account;

2.10.6.2 ensure that the minimum experience level for the PIC conducting HHO flights shall not be less than:

a) in the case of offshore:

1) 1000 hours as PIC of helicopters, or 1 000 hours as co-pilot in HHO of which 200 hours is as PIC under supervision; and

2) 50 hoist cycles conducted offshore, of which 20 cycles shall be at night if night operations are being conducted, where a hoist cycle means one down-and-up cycle of the hoist hook;

b) in the case of onshore:

1) 500 hours as PIC of helicopters, or 500 hours as co-pilot in HHO of which 100 hours is as PIC under supervision;

2) 200 hours operating experience in helicopters gained in an operational environment similar to the intended operation;

3) 50 hoist cycles, of which 20 cycles shall be at night if night operations are being conducted;

2.10.6.3 ensure successful completion of training in accordance with the HHO procedures contained in the operations manual and relevant experience in the role and environment under which HHO are conducted;

2.10.6.4 ensure that all pilots and HHO crew members conducting HHO shall have completed in the last 90 days:

a) in the case of operating by day, any combination of three day or night hoist cycles, each of which shall include a transition to and from the hover;

b) in the case of operating by night, three night hoist cycles, each of which shall include a transition to and from the hover.

2.10.6.5 ensure that the minimum crew for day or night operations shall be as stated in the operations manual. The minimum crew will be dependent on the type of helicopter, the weather conditions, the type of task, and, in addition for offshore operations, the HHO site environment, the sea state and the movement of the vessel. In no case shall the minimum crew be less than one pilot and one HHO crew member;

2.10.6.6 ensure that the training and checking be conducted in accordance with a detailed syllabus approved by CAAM and included in the operations manual.

2.10.6.7 ensure that the crew training programmes shall improve knowledge of the HHO working environment and equipment; improve crew coordination; and include measures to minimise the risks associated with HHO normal and emergency procedures and static discharge.

For avoidance of doubt, the “measures” referred to in this paragraph shall be assessed during visual meteorological conditions (VMC) day proficiency checks, or VMC night proficiency checks when night HHO are undertaken by the operator.

2.10.7 HHO passenger briefing

2.10.7.1 Prior to any HHO flight, the operator shall ensure that the passengers shall have been briefed and made aware of the dangers of static electricity discharge and other HHO considerations.

2.10.8 Information and documentation

2.10.8.1 The operator shall ensure that, as part of its risk analysis and management process, risks associated with the HHO environment are minimised 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.

2.10.8.2 The operator shall make available to the organisation for which the HHO is being provided, the relevant extracts from the operations manual in relation to the HHO.

2.11 Helicopter Emergency Medical Service (HEMS)

2.11.1 No operator shall operate a helicopter for the purpose of HEMS operations unless with the approval by the CAAM.

2.11.2 For the purpose of obtaining an approval from the CAAM, the operator shall:

a) operate in commercial air transport and hold a valid AOC;

b) demonstrate to the CAAM compliance with the requirements contained in 2.11.

2.11.3 Equipment requirements for HEMS operations

2.11.3.1 The operator shall ensure that the helicopter dedicated medical equipment to be installed to be of the type approved by the CAAM.

2.11.4 Communication

2.11.4.1 The operator shall ensure that the helicopters have communication equipment capable of conducting two-way communication with the organisation for which the HEMS is being conducted and, where possible, to communicate with ground emergency service personnel.

2.11.5 HEMS operating minima

2.11.5.1 In the case of HEMS flights operated in performance class 1 and 2, the operator shall cause to comply with the weather minima in Table 5 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.

2 PILOTS		1 PILOT	
DAY			
Ceiling	Visibility	Ceiling	Visibility
500 ft and above	As defined by the applicable airspace VFR minima	500 ft and above	As defined by the applicable airspace VFR minima
499 - 400 ft	1000 m (*)	499 – 400 ft	2000 m
399 - 300 ft	2000 m	399 – 300 ft	3000 m
NIGHT			
Cloud base	Visibility	Cloud base	Visibility
1200 ft (**)	2500 m	1200 ft (**)	3000 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 manoeuvred at a speed that will give adequate opportunity to observe any obstacles in time to avoid a collision. (**) During the en-route phase, cloud base may be reduced to 1000 ft for short periods.

Table 5: HEMS operating minima

2.11.5.2 In the case of HEMS flight operated in performance class 3, the weather minima for the dispatch and en-route phase of a HEMS flight shall be a cloud ceiling of 600 ft and a visibility of 1500 m. Visibility may be reduced to 800m 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.

2.11.6 Performance requirements for HEMS operations

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

2.11.6.2 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, except when the operator holds an approval in accordance with 3.5.

c) Helicopters conducting operations to/from a HEMS operating site located in a hostile environment shall be operated in accordance with performance class 2 and be exempt from the approval required by a), provided compliance is shown with b).

d) The HEMS operating site shall be big enough to provide adequate clearance from all obstructions. For night operations, the site shall be illuminated to enable the site and any obstructions to be identified.

2.11.7 Crew Requirements

The operator shall:

2.11.7.1 establish criteria for the selection of flight crew members for the HEMS task, taking previous experience into account;

2.11.7.2 ensure that the minimum experience level for the PIC conducting HEMS flights shall

a) either:

1) 1000 hours as PIC of aircraft of which 500 hours are as PIC on helicopters; or

2) 1000 hours as co-pilot in HEMS operations of which 500 hours are as PIC under supervision and 100 hours PIC of helicopters;

b) 500 hours operating experience in helicopters, gained in an operational environment similar to the intended operation.

c) for pilots engaged in night operations, 20 hours of VMC at night as PIC;

2.11.7.3 ensure successful completion of operational training in accordance with the HEMS procedures contained in the operations manual;

2.11.7.4 ensure that 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.

2.11.7.5 for crew composition:

a) in the case of day flight, ensure that the minimum crew by day shall be one pilot and one HEMS technical crew member:

1) This may be reduced to one pilot only when:

i) at a HEMS operating site the PIC is required to fetch additional medical supplies. In such case the HEMS technical crew member may be left to give assistance to ill or injured persons while the PIC undertakes this flight;
ii) after arriving at the HEMS operating site, the installation of the stretcher precludes the HEMS technical crew member from occupying the front seat; or
iii) the medical passenger requires the assistance of the HEMS technical crew member in flight.

2) In the cases described in (i), the operational minima shall be as defined by the applicable airspace requirements; the HEMS operating minima contained in Table 5 of 2.11.5 shall not be used.

3) Only in the case described in a)1)i) may the PIC land at a HEMS operating site without the technical crew member assisting from the front seat.

b) in the case of night flight, ensure that the minimum crew by night shall be:

1) two pilots; or

2) one pilot and one HEMS technical crew member in specific geographical areas defined by the operator in the operations manual taking into account the following:

i) adequate ground reference;
ii) flight following system for the duration of the HEMS mission;
iii) reliability of weather reporting facilities;
iv) HEMS minimum equipment list;
v) continuity of a crew concept;
vi) minimum crew qualification, initial and recurrent training;
vii) operating procedures, including crew coordination;
viii) weather minima; and
ix) additional considerations due to specific local conditions.

2.11.7.6 ensure that training and checking be conducted in accordance with a detailed syllabus approved by CAAM and included in the operations manual; and

2.11.7.7 ensure that 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.

For avoidance of doubt, the “measures” referred to in this paragraph shall be assessed during:

a) VMC day proficiency checks, or VMC night proficiency checks when night HEMS operations are undertaken by the operator; and

b) line checks.

2.11.8 HEMS medical passenger and other personnel briefing

2.11.8.1 Prior to any HEMS flight, the operator shall ensure that the 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.

2.11.8.2 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.

2.11.8.3 Medical patient. A briefing to the medical patient shall only be conducted if the PIC is of the view that his medical condition makes this practicable.

2.11.9 Information and documentation

2.11.9.1 The operator shall ensure that, as part of its risk analysis and management process, risks associated with the HEMS environment are minimised 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.

2.11.9.2 The operator shall make available to the organisation for which the HEMS is being provided, the relevant extracts from the operations manual in relation to HEMS.

2.11.10 HEMS operating base facilities

2.11.10.1 If crew members are required to be on standby with a reaction time of less than 45 minutes, the operator shall provide dedicated suitable accommodation close to each operating base.

2.11.10.2 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.

2.11.11 Fuel supply

2.11.11.1 When the HEMS mission is conducted under VFR within a local and defined geographical area, standard fuel planning maybe 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.

2.11.12 Refuelling with passengers embarking, on board or disembarking

2.11.12.1 When the pilot-in-command 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) fire fighting 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.

2.12 Helicopter Offshore Operations (HOFO)

2.12.1 The requirements of HOFO apply to:

a) a commercial air transport operator holding a valid AOC in accordance with CAD 6004 - AOC;

b) a non-commercial operator having declared its activity in accordance with this CAD.

2.12.2 Approval for helicopter offshore operations

2.12.2.1 No operator shall engage in operations under this chapter, unless it has been granted an approval by the CAAM.

2.12.2.2 To obtain such approval, the operator shall submit an application to the CAAM and shall demonstrate compliance with the requirements of this chapter.

2.12.2.3 The operator shall, prior to performing operations from a Member State other than the Member State that issued the approval under 2.12.2.1, inform the authorities in both Member States of the intended operation.

2.12.3 Operating procedures

2.12.3.1 The operator shall, as part of its safety management process, mitigate and minimise risks and hazards specific to helicopter offshore operations. The operator shall specify in the operations manual the:

a) selection, composition and training of crews;

b) duties and responsibilities of crew members and other involved personnel;

c) required equipment and dispatch criteria; and

d) operating procedures and minima, such that normal and likely abnormal operations are described and adequately mitigated.

2.12.3.2 The operator shall ensure that:

a) an operational flight plan is prepared prior to each flight, if operating from a site where it is impossible to submit an ATS flight plan, the ATS flight plan

shall be transmitted as soon as possible after take-off by the Pilot-in-command or the operator.

b) the passenger safety briefing also includes any specific information on offshore related items and is provided prior to boarding the helicopter;

c) each member of the flight crew wears an approved survival suit:

1) when the weather report or forecasts available to the pilot-in-command indicate that the sea temperature will be less than plus 10°C during the flight; or

2) when the estimated rescue time exceeds the calculated survival time; or

3) when the flight is planned to be conducted at night in a hostile environment;

d) where established, the offshore route structure provided by the appropriate ATS is followed;

e) pilots make optimum use of the automatic flight control systems (AFCS) throughout the flight;

f) specific offshore approach profiles are established, including stable approach parameters and the corrective action to be taken if an approach becomes unstable;

g) for multi-pilot operations, procedures are in place for a member of the flight crew to monitor the flight instruments during an offshore flight, especially during approach or departure, to ensure that a safe flight path is maintained;

h) the flight crew takes immediate and appropriate action when a height alert is activated;

i) procedures are in place to require the emergency flotation systems to be armed, when safe to do so, for all overwater arrivals and departures; and

j) operations are conducted in accordance with any restriction on the routes or the areas of operation specified by CAAM or the appropriate authority responsible for the airspace.

2.12.4 Use of offshore locations

2.12.4.1 The operator shall only use offshore locations that are suitable in relation to size and mass of the type of helicopter and to the operations concerned.

2.12.5 Selection of aerodromes and operating sites

2.12.5.1 Onshore destination alternate aerodrome. Notwithstanding 2.3.4.1.4 and 2.6.2, section II of this CAD. The pilot-in command does not need to specify a

destination alternate aerodrome in the operational flight plan when conducting flights from an offshore location to a land aerodrome if either:

a) the destination aerodrome is defined as a coastal aerodrome, or

b) the following criteria are met:

1) the destination aerodrome has a published instrument approach;

2) the flight time is less than 3 hours; and

3) the published weather forecast valid from 1 hour prior, and 1 hour subsequent to the expected landing time specifies that:

i) the cloud base is at least 700 feet above the minima associated with the instrument approach, or 1 000 feet above the destination aerodrome, whichever is the higher; and

ii) visibility is at least 2 500 meters.

2.12.5.2 Offshore destination alternate helideck. The operator may select an offshore destination alternate helideck when all of the following criteria are met:

a) An offshore destination alternate helideck shall be used only after the point of no return (PNR) and when an onshore destination alternative aerodrome is not geographically available. Prior to the PNR, an onshore destination alternate aerodrome shall be used.

b) One engine inoperative (OEI) landing capability shall be attainable at the offshore destination alternate helideck.

c) To the extent possible, helideck availability shall be guaranteed prior to PNR. The dimensions, configuration and obstacle clearance of individual helidecks or other sites shall be suitable for its use as an alternate helideck by each helicopter type intended to be used.

d) Weather minima shall be established taking into account the accuracy and reliability of meteorological information.

e) The MEL shall contain specific provisions for this type of operation.

f) An offshore destination alternate helideck shall only be selected if the operator has established a procedure in the operations manual.

2.12.6 Airborne radar approaches (ARAs) to offshore locations

2.12.6.1 A commercial air transport (CAT) operator shall establish operational procedures and ensure that ARAs are only flown if:

a) the helicopter is equipped with a radar that is capable of providing information regarding the obstacle environment; and

b) either:

1) the minimum descent height (MDH) is determined from a radio altimeter; or

2) the minimum descent altitude (MDA) plus an adequate margin is applied.

2.12.6.2 ARAs to rigs or vessels in transit shall be flown as multi-pilot operations.

2.12.6.3 The decision range shall provide adequate obstacle clearance in the missed approach from any destination for which an ARA is planned.

2.12.6.4 The approach shall only be continued beyond decision range or below the minimum descent altitude/height (MDA/H) when visual reference to the destination has been established.

2.12.6.5 For single-pilot CAT operations, appropriate increments shall be added to the MDA/H and decision range.

2.12.6.6 When an ARA is flown to a non-moving offshore location (i.e. fixed installation or moored vessel) and a reliable GPS position for the location is available in the navigation system, the GPS/area navigation system shall be used to enhance the safety of the ARA.

2.12.7 Meteorological conditions

2.12.7.1 Notwithstanding 2.3.5.1.1,2.12.8, 2.6.2, section II, when flying between offshore locations located in class G airspace where the overwater sector is less than 10 NM, VFR flights may be conducted when the limits are at, or better than, the following:

Minima for flying between offshore locations located in class G airspace

	Day		**Night**	
	Height*	**Visibility**	**Height***	**Visibility**
Single pilot	300 feet	3 km	500 feet	5 km
Two pilots	300 feet	2 km**	500 feet	5 km**

Table X

* The cloud base shall allow flight at the specified height to be below and clear of cloud.

** Helicopters may be operated in flight visibility down to 800 m, provided the destination or an intermediate structure is continuously visible.

*** Helicopters may be operated in flight visibility down to 1 500 m, provided the destination or an intermediate structure is continuously visible.

2.12.8 Wind limitations for operations to offshore locations

2.12.8.1 Operation to an offshore location shall only be performed when the wind speed at the helideck is reported to be not more than 60 knots including gusts or *within the helicopter operating limitations contained in the flight manual*.

2.12.9 Performance requirements at offshore locations

2.12.9.1 Helicopters taking off from and landing at offshore locations shall be operated in accordance with the performance within the helicopter operating limitations contained in the flight manual.

2.12.10 Flight data monitoring (FDM) system

2.12.10.1 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.

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

2.12.11 Aircraft tracking system

2.12.11.1 An operator 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.

2.12.12 Vibration health monitoring (VHM) system

2.12.12.1 The following helicopters conducting CAT 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:

a) complex motor-powered helicopters first issued with an individual Certificate of Airworthiness (CofA) 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 CofA before 1 January 2017;

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

2.12.12.2 The operator shall have a system to:

a) collect the data including system generated alerts;

b) analyse and determine component serviceability; and

c) respond to detected incipient failures.

2.12.13 Equipment requirements

2.12.13.1 The operator shall comply with the following equipment requirements:

a) Public Address (PA) system in helicopters used for CAT and General Aviation:

1) Helicopters with a maximum approved passenger seating configuration of more than 9 shall be equipped with a PA system.

2) Helicopters with an maximum approved passenger seating configuration 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.

b) Radio altimeter. 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.

2.12.13.2 Emergency exits.

All emergency exits, including crew emergency exits, and any door, window or other opening that is suitable for emergency egress, and the means for opening them shall be clearly marked for the guidance of occupants using them in daylight or in the dark. Such markings shall be designed to remain visible if the helicopter is capsized or the cabin is submerged.

2.12.13.3 Helicopter terrain awareness warning system (HTAWS)

Helicopters used in CAT operations 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 that meets the requirements for class A equipment as specified in an acceptable standard.

2.12.14 Additional procedures and equipment for operations in a hostile environment

2.12.14.1 Life jackets. Approved life jackets shall be worn at all times by all persons on board unless integrated survival suits that meet the combined requirement of the survival suit and life jacket are worn.

2.12.14.2 Survival suits. All passengers on board shall wear an approved survival suit:

a) when the weather report or forecasts available to the pilot-in-command indicate that the sea temperature will be less than plus 10 °C during the flight; or

b) when the estimated rescue time exceeds the calculated survival time; or

c) when the flight is planned to be conducted at night.

2.12.14.3 Emergency breathing system. All persons on board shall carry and be instructed in the use of emergency breathing systems (EBS).

2.12.14.4 Life rafts

a) All life rafts carried shall be installed so as to be usable in the sea conditions in which the helicopter's ditching, flotation, and trim characteristics were evaluated for certification.

b) All life rafts carried shall be installed so as to facilitate their ready use in an emergency.

c) The number of life rafts installed:

1) in the case of a helicopter carrying less than 12 persons, at least one life raft with a rated capacity of not less than the maximum number of persons on board; or

2) in the case of a helicopter carrying more than 11 persons, at least two life rafts, sufficient together to accommodate all persons capable of being carried on board and, if one is lost, the remaining life raft(s) having the overload capacity sufficient to accommodate all persons on the helicopter.

d) Each life raft shall contain at least one survival emergency locator transmitter (ELT(S)); and

e) Each life raft shall contain life-saving equipment, including means of sustaining life, as appropriate to the flight to be undertaken.

2.12.14.5 Emergency cabin lighting. The helicopter shall be equipped with an emergency lighting system with an independent power supply to provide a source of general cabin illumination to facilitate the evacuation of the helicopter.

2.12.14.6 Automatically deployable emergency locator transmitter (ELT(AD)). The helicopter shall be equipped with an ELT(AD) that is capable of transmitting simultaneously on 121.5 MHz and 406 MHz.

2.12.14.7 Securing of non-jettisonable doors. Non-jettisonable doors that are designated as ditching emergency exits shall have a means of securing them in the open position so that they do not interfere with the occupants' egress in all sea conditions up to the maximum sea conditions required to be evaluated for ditching and flotation.

2.12.14.8 Emergency exits and escape hatches. All emergency exits, including crew emergency exits, and any door, window or other opening suitable to be used for the purpose of underwater escape shall be equipped so as to be operable in an emergency.

2.12.14.9 Notwithstanding 2.12.14.1, 2.12.14.2 and 2.12.14.3 above the operator may, based on a risk assessment, allow passengers, medically incapacitated at an offshore location, to partly wear or not wear life jackets, survival suits or emergency breathing systems on return flights or flights between offshore locations.

2.12.15 Crew requirements

2.12.15.1 The operator shall establish:

a) criteria for the selection of flight crew members, taking into account the flight crew members' previous experience;

b) a minimum experience level for a pilot-in-command intending to conduct offshore operations; and

c) a flight crew training and checking programme that each flight crew member shall complete successfully. Such programme shall be adapted to the offshore environment and include normal, abnormal and emergency procedures, crew resource management, water entry and sea survival training.

2.12.15.2 Recency requirements. A pilot shall only operate a helicopter carrying passengers:

a) at an offshore location, as pilot-in-command, or co-pilot, when he has carried out in the preceding 90 days at least 3 take-offs, departures, approaches and landings at an offshore location in a helicopter of the same type or a full flight simulator (FFS) representing that type; or

b) by night at an offshore location, as pilot-in-command, or co-pilot, when he has carried out in the preceding 90 days at least 3 take-offs, departures, approaches and landings at night at an offshore location in a helicopter of the same type or an FFS representing that type. The 3 take-offs and landings shall be performed in either multi-pilot or single-pilot operations, depending on the operation to be performed.

2.12.15.3 Specific requirements for CAT:

a) The 90-day period presented in points 2.12.15.2 a) and (b) above may be extended to 120 days as long as the pilot undertakes line flying under the supervision of a type rating instructor or examiner.

b) If the pilot does not comply with the requirements in a), he shall complete a training flight in the helicopter or an FFS of the helicopter type to be used, which shall include at least the requirements described in 2.12.15.2 (a) and (b) before he or she can exercise his or her privileges.

3 Helicopter Performance Operating Limitations

3.1 General

3.1.1 Performance applicability – helicopters

3.1.1.1 An operator must ensure that an helicopter corresponds to one of the following descriptions is operated in accordance with the specified Performance Class:

a) a helicopter with an MAPSC exceeding 19 must be operated in Performance Class 1;

b) a helicopter operating to or from a heliport in a congested hostile environment must be operated in Performance Class 1;

c) a helicopter with an MAPSC exceeding 9 but not exceeding 19 may be operated in Performance Class 1 or 2;

d) a helicopter with an MAPSC not exceeding 9 may be operated in Performance Class 1, 2 or 3.

3.1.1.2 Before operating a helicopter described in 3.1.1.1 a) in Performance Class 1, the AOC holder must ensure that the helicopter is certificated in Category A.

3.1.1.3 Where a helicopter described in 3.1.1.1 c) or d) is to be operated in Performance Class 2, the AOC holder must ensure that:

a) the helicopter is certificated in Category A; and

b) Helicopters if the helicopter is to be operated in a flight phase when an engine failure may cause the helicopter to make a forced landing, the surface below the intended flight path is conducive for a safe forced landing.

3.1.1.4 Where a helicopter described in 3.1.1.1 d) is to be operated in Performance Class 3, the AOC holder must ensure that:

a) the helicopter is certificated in Category B;

b) the helicopter is not operated under the following circumstances:

1) when the surface is not in sight;

2) at night;

3) when the cloud ceiling is less than 180 m (600 ft) or the visibility is less than 1,500 m;

4) over an open sea area

i) North of 45ºN or South of 45ºS;
ii) between 45ºN or 45ºS, when it is a hostile environment; or

iii) between 45ºN or 45ºS for more than 10 minutes on any one flight; and

c) if the helicopter is to be operated in a flight phase when an engine failure may cause the helicopter to make a forced landing, the surface below the intended flight path is conducive for a safe forced landing.

3.1.1.5 Notwithstanding 3.1.1.4 b) 4) an operator may operate a helicopter described in paragraph 3.1.1.1 d) in Performance Class 3 over an open sea area if its Operations Manual contains procedures addressing such overwater flights.

3.1.1.6 Notwithstanding 3.1.1.3 b) and 3.1.1.4 c), the CEO of the CAAM may (based on the results of a safety risk assessment conducted by an AOC holder) allow a helicopter to be operated in a flight phase when an engine failure may cause the helicopter to make a forced landing, even if the surface below the intended flight path is not conducive for a safe forced landing.

3.1.1.7 The safety risk assessment mentioned in 3.1.1.6 shall include an assessment of at least the following matters:

a) the type and circumstances of the operation;

b) the area or terrain over which the operation is to be 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 or engines;

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

f) the helicopter equipment.

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 a manner that gives appropriate consideration for achieving a safe forced landing.

Note - Guidance is contained in Attachment A, 2.4.

3.1.2.1 Where CAAM permits IMC operations in performance Class 3, such operations shall be conducted in accordance with the provisions of 3.4.

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

3.1.4 Where helicopters are operated to or from heliports in a congested hostile environment, the competent authority of the State in which the heliport is situated shall specify the requirements to enable these operations to be conducted in a

manner that gives appropriate consideration for the risk associated with an engine failure.

Note - Guidance on "appropriate consideration" is contained in Attachment A, 2.4.

3.2 Applicable to helicopters certificated in accordance with Part IV of CAD 8

3.2.1 The Standards contained in 3.2.2 to 3.2.7 inclusive are applicable to the helicopters to which Part IV of CAD 8 is applicable.

Note.- The following Standards do not include quantitative specifications comparable to those found in national airworthiness codes. In accordance with 3.1.1, they are to be supplemented by national requirements prepared by CAAM.

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

Note - Attachment A contains guidance material which indicates, by an Example, the level of performance intended by the Standards and Recommended Practices of this chapter.

3.2.3 A 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 Operators 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 In applying the Standards of this chapter, account shall be taken of all factors that significantly affect the performance of the helicopter (such as: mass, operating procedures, the pressure-altitude appropriate to the elevation of the operating site, temperature, wind and condition of the surface). Such factors shall be taken into account directly as operational parameters or indirectly by means of allowances or margins, which may be provided in the scheduling of performance data or in the code of performance in accordance with which the helicopter is being operated.

3.2.7 Mass limitations

3.2.7.1 An operator shall ensure that the mass of the helicopter:

a) At the start of the take-off, or, in the event of in-flight replanning,

b) At the point from which the revised operational flight plan applies,

is not greater than the mass at which the relevant requirements of these Directives can be complied with for the flight to be undertaken, allowing for expected reductions in mass as the flight proceeds, and for such fuel jettisoning as is provided for in the particular requirement.

3.2.7.2 An operator shall ensure that the approved performance data contained in the Helicopter Flight Manual is used to determine compliance with the relevant requirements of these Directives, supplemented as necessary with other data acceptable to the CAAM as prescribed in the relevant Directive. When applying the factors prescribed in the appropriate Directive, account may be taken of any operational factors already incorporated in the Helicopter Flight Manual performance data to avoid double application of factors.

3.2.7.3 When showing compliance with the relevant requirements in these Directives, due account shall be taken of the following parameter:

a) mass of the helicopter.

b) helicopter configuration.

c) environmental conditions, in particular:

1) pressure-altitude, and temperature.

2) wind:

i) for take-off, take-off flight path and landing requirements, accountability for wind shall be no more than 50% of any reported steady head wind component of 5 knots or more.

ii) Where take-off and landing with a tail wind component is permitted in the Helicopter Flight Manual, and in all cases for the takeoff flight path, not less than150% of any reported tail wind component shall be taken into account.

iii) Where precise wind measuring equipment enables accurate measurement of wind velocity over the point of take-off and landing, alternate wind components specific to a site may be approved by the CAAM.

d) operating techniques; and

e) operation of any system which have adverse effect on performance.

3.2.7.4 Obstacle accountability.

3.2.7.4.1 For the purpose of obstacle clearance requirements, an obstacle, located beyond the FATO, in the take-off flight path or the missed approach flight path, shall be considered if its lateral distance from the nearest point on the surface below the intended flight path is not further than:

a) For VFR operations:

1) half of the minimum FATO (or the equivalent term used in the Flight Manual) width defined in the Helicopter Flight Manual (or, when no width is defined 0.75 D), plus 0.25 times D (or 3 m, whichever is greater), plus:

0.10 DR for VFR day operations

0.15 DR for VFR night operations

b) For IFR operations:

1) 1.5 D (or 30 m, whichever is greater), plus:

0.10 DR for IFR operations with accurate course guidance

0.15 DR for IFR operations with standard course guidance

0.30 DR for IFR operations without course guidance

2) when considering the missed approach flight path, the divergence of the obstacle accountability area only applies after the end of the takeoff distance available.

3) standard course guidance includes ADF and VOR guidance. Accurate course guidance include ILS, MLS or other course guidance providing an equivalent navigational accuracy.

c) For operations with initial takeoff conducted visually and converted to IFR/IMC at a transition point, the criteria required in (a) apply up to the transition point then the criteria required in (b) apply after the transition point:

1) the transition point cannot be located before the end of TODRH for helicopters operating in performance Class 1 and before the DPATO for helicopters operating in performance Class 2.

2) For take-off using a backup (or a lateral transition) procedure; for the purpose of obstacle clearance requirements, an obstacle, located in the back-up (or lateral transition) area, shall be considered if its lateral distance from the nearest point on the surface below the intended flight path is not further than:

i) half of the minimum FATO (or the equivalent term used in the Flight Manual) width defined in the Helicopter Flight Manual (or, when no width is defined 0.75 D), plus 0.25 times D (or 3 m, whichever is greater), plus 0.10 for VFR day, or 0.15 for VFR night, of the distance travelled from the back of the FATO.

3) Obstacles may be disregarded if they are situated beyond:

i) 7 R for day operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb.

ii) 10 R for night operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb.

iii) 300 m if navigational accuracy can be achieved by appropriate navigation aids; and

iv) 900 m in the other cases.

3.2.8 PERFORMANCE CLASS 1

3.2.8.1 An operator shall ensure that helicopters operated in Performance Class 1 are certificated in Category A. (See Note below)

Note1.- Performance Class 1 operations are those with performance such that, in the event of failure of the critical power unit, the helicopter is able to land within the rejected take-off distance available or safely continue the flight to an appropriate landing area, depending on when the failure occurs.

Note2.- 'Category A' with respect to helicopters means multi-engine helicopters designed with engine and system isolation features specified in CS-27/29 or equivalent acceptable to the CAAM and Helicopter Flight Manual performance information based on a critical engine failure concept which assures adequate designated surface area and adequate performance capability for continued safe flight in the event of an engine failure.

3.2.8.2 Take-Off.

a) An operator shall ensure that:

1) The take-off mass does not exceed the maximum take-off mass specified in the Helicopter Flight Manual's, for the procedures to be used.

2) The take-off mass is such that:

i) It is possible to reject the takeoff and land on the FATO in case of the critical power unit failure being recognised at or before the TDP.

ii) The rejected take-off distance required does not exceed the rejected take-off distance available; and

iii) The take-off distance required does not exceed the take-off distance available.

iv) As an alternative, the requirement in (iii) above may be disregarded provided that the helicopter, with the critical power unit failure recognised at TDP can, when continuing the take-off, clear all obstacles to the end of the take-off distance required by a vertical margin of not less than 10.7 m (35 ft).

b) When showing compliance with sub-paragraph (a) above, account shall be taken of the appropriate parameters of the provisions in Paragraph 3.2.7.3 at the heliport of departure:

1) The part of the take-off up to and including TDP shall be conducted in sight of the surface such that a rejected take-off can be carried out.

2) For take-off using a backup (lateral transition) procedure, the operator shall ensure that, with the critical power-unit inoperative, all obstacles in the back-up (lateral transition) area are cleared by an adequate margin.

3.2.8.3 Take-off Flight Path.

a) An operator shall ensure that, from the end of the take-off distance required with the critical power unit failure recognised at the TDP:

1) The take-off mass is such that the take-off flight path provides a vertical clearance of not less than 10.7 m (35 ft) for VFR operations and 10.7 m (35 ft) + 0.01 DR for IFR operations above all obstacles located in the climb path.

2) Where a change of direction of more than 15° is made, adequate allowance is made for the effect of bank angle on the ability to comply with the obstacle clearance requirements. This turn is not to be initiated before reaching a height of 61 m (200 ft) above the take-off surface unless permitted as part of an approved procedure in the Flight Manual.

b) When showing compliance with subparagraph 1) above, account shall be taken of the appropriate parameters in Paragraph 3.2.7.3 at the heliport of departure.

3.2.8.4 En-route - critical power unit inoperative.

a) An operator shall ensure that the en-route flight path with the critical power unit inoperative, appropriate to the meteorological conditions expected for the flight complies with either sub-paragraph 1), 2) or 3) below at all points along the route.

1) When it is intended that the flight will be conducted at any time out of sight of the surface, the mass of the helicopter permits a rate of climb of at least 50 ft/minute with the critical power unit inoperative at an altitude of at least 300 m (1000 ft), 600 m (2000 ft) in areas of mountainous terrain above all terrain and obstacles along the route within 9.3 km (5 nm) on either side of the intended track.

2) When it is intended that the flight will be conducted without the surface insight, the flight path permits the helicopter to continue flight from the cruising altitude to a height of 300 m (1000 ft) above a landing site where a landing can be made in accordance with Paragraph 3.2.8.5. The flight path clears vertically, by at least 300 m (1000 ft) 600 m (2000 ft) in areas of mountainous terrain all terrain and obstacles along the route within 9.3 km (5 nm) on either side of the intended track.

3) When it is intended that the flight will be conducted in VMC and the surface in sight, the flight path permits the helicopter to continue flight from the cruising altitude to a height of 300 m (1000 ft) above a landing site where a landing can be made in accordance with Paragraph 3.2.8.5, without flying at any time below the appropriate minimum flight altitude, obstacles within 900m on either side of the route need to be considered.

b) When showing compliance with paragraphs a)2) and a)3) above an operator shall ensure that:

1) The critical power unit is assumed to fail at the most critical point along the route.

2) Account is taken of the effects of winds on the flight path.

3) Fuel jettisoning is planned to take place only to an extent consistent with reaching the heliport with the required fuel reserves and using a safe procedure.

4) Fuel jettisoning is not planned below 1000 ft above terrain.

c) The width margins of subparagraphs a)1) and a)2) above shall be increased to 18.5 km (10 nm) if the navigational accuracy cannot be met for 95% of the total flying time.

3.2.8.5 Landing.

a) An operator shall ensure that:

1) The landing mass of the helicopter at the estimated time of landing does not exceed the maximum mass specified in the Helicopter Flight Manual's.

2) In the event of the critical power unit failure being recognised at any point at or before the LDP, it is possible either to land and stop within the FATO, or to perform a balked landing and clear all obstacles in the flight path by a vertical margin of 10.7 m (35 ft).

3) In the event of the critical power-unit failure being recognised at any point at or after the LDP, it is possible to clear all obstacles in the approach path; and

4) In the event of the critical power-unit failure being recognised at any point at or after the LDP, it is possible to land and stop within the FATO.

b) When showing compliance with subparagraph a)1) above, account shall be taken of the appropriate parameters of Paragraph 3.2.7.3 for the estimated time of landing at the destination heliport, or any alternate if required.

c) That part of the landing from the LDP to touchdown, shall be conducted in sight of the surface.

3.2.9 PERFORMANCE CLASS 2

3.2.9.1 An operator shall ensure that Helicopters operated in Performance Class 2 are certificated in Category A. see Notes below.

Note1.- Performance Class 2 operations are those operations such that, in the event of critical power unit failure, performance is available to enable the helicopter to safely continue the flight, except when the failure occurs early during the take-off manoeuvre or late in the landing manoeuvre, in which cases a forced landing may be required.

Note2.- 'Category B' with respect to helicopters means single-engine or multi-engine helicopters which do not fully meet all Category A standards. Category B helicopters have no guaranteed stay-up ability in the event of engine failure and unscheduled landing is assumed.

3.2.9.2 Operations Without an Assured Safe Forced Landing Capability.

a) An operator shall be satisfied that operations without an assured safe forced landing capability during the take-off and landing phases are not conducted unless the operator has been granted the relevant approval by the CAAM.

b) Approval:

1) Following a risk assessment, an operator may be authorised to conduct operations without an assured safe forced landing capability during the take-off and landing phases, under an approval specifying:

i) The type of helicopter; and
ii) The type of operations.

2) Such an approval shall be subject to the following conditions:

i) A set of conditions to be implemented by the operator to obtain and maintain the approval for the helicopter type.
ii) Implementation of a Usage Monitoring System.

3.2.9.3 Take-off.

a) An operator shall be satisfied that:

1) The take-off mass does not exceed the maximum mass specified for a rate of climb of 150 ft/min at 300 m (1000 ft) above the level of the heliport with the critical power unit inoperative and the remaining power units operating at an appropriate power rating.

2) For operations other than specified in Paragraph 3.2.9.2, the take-off is conducted such safe forced landing can be executed until the point where safe continuation of the flight is possible.

3) For operations in accordance with the provisions in Paragraph 3.2.9.2 in addition to the requirements of a)1) above:

i) The take-off mass does not exceed the maximum mass specified in the Helicopter Flight Manual for an AEO OGE hover in still air with all power units operating at an appropriate power rating.

ii) For operations to/from a helideck:

A. with a helicopter that has a maximum approved passenger seating configuration of more than 19; and

B. any helicopter operated to/from a helideck located in a non-congested hostile environment

the take-off mass takes into account: the procedure; deck-edge miss; and drop down appropriate to the height of the helideck – with the critical power unit(s) inoperative and the remaining power units operating at an appropriate power rating.

b) When showing compliance with subparagraph (a) above, account shall be taken of the appropriate parameters of 3.2.7.3 at the heliport of departure.

c) The part of the take-off before the requirement of Paragraph 3.2.9.4 is met shall be conducted in sight of the surface.

3.2.9.4 Take-off Flight Path.

3.2.9.4.1 An operator shall be satisfied that from DPATO or, as an alternative, no later than 200 ft above the take-off surface, with the critical powerunit inoperative the requirements of Paragraph 3.2.8.3 are met.

3.2.9.5 En-route - Critical power unit inoperative.

3.2.9.5.1 An operator shall ensure that the requirement of Paragraph 3.2.8.4 is met.

3.2.9.6 Landing.

a) An operator shall be satisfied that:

1) The landing mass at the estimated time of landing does not exceed the maximum mass specified for a rate of climb of 150 ft/min at 300 m (1000 ft) above the level of the heliport with the critical power unit inoperative and the remaining power units operating at an appropriate power rating.

2) If the critical power unit fails at any point in the approach path:

i) a balked landing can be carried out meeting the requirement of 3.2.9.4; or

ii) for operations other than specified in 3.2.9.2 the helicopter can perform a safe-forced landing.

3) For operations in accordance with Paragraph 3.2.9.2 in addition to the requirements of (a)(1) above:

i) The landing mass does not exceed the maximum mass specified in the Helicopter Flight Manual for an AEO OGE hover in still air with all power units operating at an appropriate power rating.

ii) For operations to/from a helideck:

A. with a helicopter that has a maximum approved passenger seating configuration of more than 19; and

B. any helicopters operated to/from a helideck located in a non-congested hostile environment the landing mass takes into account the procedure, and drop down appropriate to the height of the helideck - with the critical power unit inoperative and the remaining power unit(s) operating at an appropriate power rating.

b) When showing compliance with subparagraph 1) above, account shall be taken of the appropriate parameters of Paragraph 3.2.7.3 at the destination heliport or any alternate, if required.

c) The part of the landing after which the requirement of a)2)i) cannot be met shall be conducted in sight of the surface.

3.2.10 PERFORMANCE CLASS 3

3.2.10.1 An operator shall ensure that:

a) Helicopters operated in Performance Class 3 are certificated in either Category A or B.

b) Operations are only conducted from/to those heliports and over such routes, areas and diversions contained in a non-hostile environment, except for take-off and landing as provided in 3.2.10.2 below.

Note.- Performance Class 3 operations are those operations such that, in the event of a power unit failure at any time during the flight, a forced landing may be required in a multi-engined helicopter but will be required in a single engine helicopter.

3.2.10.2 An operator may conduct operations to/from a heliport located outside a congested hostile environment, without an assured safe forced landing capability during the take-off and landing phases:

a) during take-off; before reaching Vy or 200 ft above the take-off surface; or

b) during landing; below 200 ft above the landing surface; provided the operator has been granted a relevant approval by the CAAM in accordance with 3.2.9.7.

3.2.10.3 An operator shall ensure that operations are not conducted:

a) out of sight of the surface.

b) at night.

c) when the ceiling is less than 600 ft; or

d) when the visibility is less than 800m.

3.2.10.4 Take-off.

a) An operator shall ensure that:

1) The take-off mass does not exceed the maximum take-off mass specified for a hover in ground effect with all power units operating at take-off power. If conditions are such that a hover in ground effect is not likely to be established, the take-off mass shall not exceed the maximum take-off mass specified for a hover out of ground effect with all power units operating at take-off power.

2) In the event of a power unit failure, the helicopter is able to perform a safe forced landing, except when operated in accordance with the alleviation contained in 3.2.10.2.

3.2.10.5 En-route

a) An operator shall ensure that:

1) The helicopter is able, with all power units operating within the maximum continuous power conditions specified, to continue along its intended route or to a planned diversion without flying at any point below the appropriate minimum flight altitude; and

2) in the event of a power unit failure, the helicopter is able to perform a safe forced landing.

3.2.10.6 Landing.

a) The landing mass of the helicopter at the estimated time of landing does not exceed the maximum landing mass specified for a hover in ground effect, with all power units operating at take-off power. If conditions are such that a hover in ground effect is not likely to be established, the landing mass shall not exceed the maximum landing mass specified for a hover out of ground effect with all power units operating at take-off power.

b) in the event of a power unit failure, the helicopter is able to perform a safe forced landing, except when operated in accordance with the alleviation contained in 3.2.10.2.

3.3 Obstacle data

3.3.1 The operator shall use available obstacle data to develop procedures to comply with the take-off, initial climb, approach and landing phases detailed in the code of performance established by the CAAM.

3.4 Additional requirements for operations of helicopters in performance Class 3 in IMC, except special VFR flights

3.4.1 Operations in performance Class 3 in IMC shall be conducted only over a surface environment acceptable to the CAAM or competent authority of the State over which the operations are performed.

3.4.2 In approving operations by helicopters operating in performance Class 3 in IMC, the helicopter shall be certificated for flight under IFR and that the overall level of safety intended by the provisions of CAD 6 and 8 is provided by:

a) the reliability of the engines;

b) the operator's maintenance procedures, operating practices and crew training programmes; and

c) equipment and other requirements provided in accordance with Appendix 2.

Note - Guidance on additional requirements for operations of helicopters in performance Class 3 in IMC is contained in Appendix 2.

3.4.3 Operators of helicopters operating in performance Class 3 in IMC shall have a programme for engine trend monitoring and shall utilise the engine and helicopter manufacturers' recommended instruments, systems and operational/maintenance procedures to monitor the engines.

3.4.4 In order to minimise the occurrence of mechanical failures, helicopters operating in IMC in performance Class 3 shall utilise vibration health monitoring for the tail-rotor drive system.

3.5 Helicopter operations to/from a public interest site

3.5.1 Helicopter operations to/from a public interest site shall be applicable to performance class 1 helicopters.

3.5.2 Operations to/from a public interest site (PIS) may be conducted in performance class 2, without complying with 3.2.9.3 a)2) or 3.2.9.6 a)2), provided that all of the following are complied with:

a) the PIS was in use before 1 July 2002;

b) the size of the PIS or obstacle environment does not permit compliance with the requirements for operation in performance class 1;

c) the operation is conducted with a helicopter with an MOPSC of six or less;

d) the operator complies with 3.2.9.2 b)2);

e) the helicopter mass does not exceed the maximum mass specified in the AFM for a climb gradient of 8 % in still air at the appropriate take-off safety speed (V_{TOSS}) with the critical engine inoperative and the remaining engines operating at an appropriate power rating; and

f) the operator has obtained prior approval for the operation from the CAAM. Before such operations take place in another Member State, the operator shall obtain an endorsement from the competent authority of that State.

3.5.3 Site-specific procedures shall be established in the operations manual to minimise the period during which there would be danger to helicopter occupants and persons on the surface in the event of an engine failure during take-off and landing.

3.5.4 The operations manual shall contain for each PIS: a diagram or annotated photograph, showing the main aspects, the dimensions, the non-conformance with the requirements performance class 1, the main hazards and the contingency plan should an incident occur.

3.6 Helicopter performance class 3 operations over a hostile environment located outside a congested area

3.6.1 Operations over a non-congested hostile environment without a safe forced landing capability with turbine-powered helicopters with an MOPSC of six or less shall only be conducted if the operator has been granted an approval by the the CAAM, following a safety risk assessment performed by the operator. Before such operations take place in another Member State, the operator shall obtain an endorsement from the competent authority of that State.

3.6.2 To obtain and maintain such approval the operator shall:

a) only conduct these operations in the areas and under the conditions specified in the approval;

b) not conduct these operations under a HEMS approval;

c) substantiate that helicopter limitations, or other justifiable considerations, preclude the use of the appropriate performance criteria; and

d) be approved in accordance with 3.2.9.2 b).

3.6.3 Notwithstanding 2.3.8.1, such operations may be conducted without supplemental oxygen equipment, provided the cabin altitude does not exceed 10 000 ft for a period in excess of 30 minutes and never exceeds 13 000 ft pressure altitude.

4 Helicopter Instruments, Equipment and Flight Documents

Note - Specifications for the provision of helicopter communication and navigation equipment are contained in Chapter 5.

4.1 General

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 CAAM.

4.1.2 A helicopter shall carry a certified true copy of the air operator certificate specified in 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 CAAM in a language other than English, an English translation shall be included.

Note - Provisions for the content of the air operator certificate and its associated operations specifications are contained in 2.2.1.5 and 2.2.1.6.

4.1.3 The operator shall include in the operations manual a minimum equipment list (MEL), approved by CAAM 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. Where the State of the Operator is not the State of Registry, the State of the Operator shall ensure that the MEL does not affect the helicopter's compliance with the airworthiness requirements applicable in the State of Registry.

Note - Attachment C contains guidance on the minimum equipment list.

4.1.4 The operator 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.

Note - Guidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (ICAO Doc 9683).

4.1.5 Instruments and equipment minimum performance standards are those prescribed in the applicable Technical Standard Orders unless different performance standards are prescribed in the operational or airworthiness codes. Instruments and equipment complying with design and performance specifications on the date of this Directive implementation may remain in service, or be installed, unless additional requirements are prescribed in this Directives. Instruments and

equipment that have already been approved do not need to comply with a revised TSO or a revised specification, unless a retroactive requirement is prescribed.

4.1.6 Helicopter operated under an Article 83 *bis* agreement

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

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

Note.— Guidance regarding the agreement summary is contained in Doc 10059.

4.1.6.2 The agreement summary of an Article 83 *bis* agreement shall be accessible to a CAAM inspector, in determining which functions and duties are transferred by the State of Registry to the State of the Operator under the agreement, when conducting surveillance activities such as ramp checks.

Note.— Guidance for the civil aviation safety inspector conducting an inspection of an aeroplane operated under an Article 83 bis agreement is contained in the Manual of Procedures for Operations Inspection, Certification and Continued Surveillance (Doc 8335).

4.2 All helicopters on all flights

4.2.1 A helicopter shall be equipped with instruments that will enable the flight crew to control the flight path of the helicopter, carry out any required procedural manoeuvres and observe the operating limitations of the helicopter in the expected operating conditions.

4.2.2 A helicopter shall be equipped with:

a) accessible and adequate medical supplies;

Medical supplies shall comprise:

1) a first-aid kit, of which the requirements are

i) Inspected periodically to confirm, to the extent possible, that contents are maintained in the condition necessary for their intended use; and
ii) Replenished at regular intervals, in accordance with instructions contained on their labels, or as circumstances warrant;
iii) Readily accessible for use; and

2) 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.

Note.- Guidance on the contents of first-aid and universal precaution kits is given in Attachment B.

b) portable fire extinguishers of a type which, when discharged, will not cause dangerous contamination of the air within the helicopter. These fire extinguishers are provided for use in crew, passenger and, as applicable, cargo compartments and galleys in accordance with the following:

1) The type and quantity of extinguishing agent must be suitable for the kinds of fires likely to occur in the compartment where the extinguisher is intended to be used and, for personnel compartments, must minimise the hazard of toxic gas concentration.
2) At least one hand fire extinguisher, containing Halon 1211 (bromochlorodifluoro-methane, CBrClF2), or equivalent as the extinguishing agent, must be conveniently located in the cockpit for use by the flight crew.
3) At least one hand fire extinguisher must be located in, or readily accessible for use in, each galley not located on the main passenger deck.
4) At least one readily accessible hand fire extinguisher must be available for use in each cargo compartment which is accessible to crew members during flight for the purpose of firefighting; and
5) There must be at least the following number of hand fire extinguishers conveniently located to provide adequate availability for use in each passenger compartment.

Passenger compartment seating capacity	Minimum number of Hand Fire Extinguishers
7 to 30	1
31 to 60	2
61 to 200	3

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 4.2.2.1 for fire extinguishing agents.

c) Helicopters shall be equipped with:

1) a seat or berth for each person on board who is aged 24 months or more;
2) a seat belt on each passenger seat and restraining belts for each berth;
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.

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

4) for helicopters first issued with an individual CofA on or after 1 August 1999, a safety belt with upper torso restraint system for use on each passenger seat for each passenger aged 24 months or more;
5) a child restraint device (CRD) for each person on board younger than 24 months;
6) a seat belt with upper torso restraint system incorporating a device that will automatically restrain the occupant's torso in the event of rapid deceleration on each flight crew seat;
7) a seat belt with upper torso restraint system on each seat for the minimum required cabin crew;
8) A seat belt with upper torso restraint system shall:

i) have a single point release; and
ii) on flight crew seats and on the seats for the minimum required cabin crew include two shoulder straps and a seat belt that may be used independently.

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.

Note 3.- All safety harnesses and safety belts must have a single point release. A safety belt with a diagonal shoulder strap is permitted if it is not reasonably practicable to fit the latter.

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. The number of spare fuses available for use in flight equal to at least 10% of the number of fuses of each rating or three of each rating whichever is the greater.

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 CAAM; and

b) not be of a type listed in the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer as it appears in the Eighth Edition of the Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer, Annex A, Group II.

Note.- Information concerning extinguishing agents is contained in the UNEP Halons Technical Options Committee Technical Note No. 1 – New Technology Halon Alternatives and FAA Report No. DOT/FAA/AR-99-63, Options to the Use of Halons for Aircraft Fire Suppression Systems.

4.2.3 A helicopter shall carry:

a) the operations manual prescribed in 2.2.2, 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; and

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

d) For helicopters with an maximum approved passenger seating configuration of more than 19 one portable battery- powered megaphone readily accessible for use by crew members during an emergency evacuation.

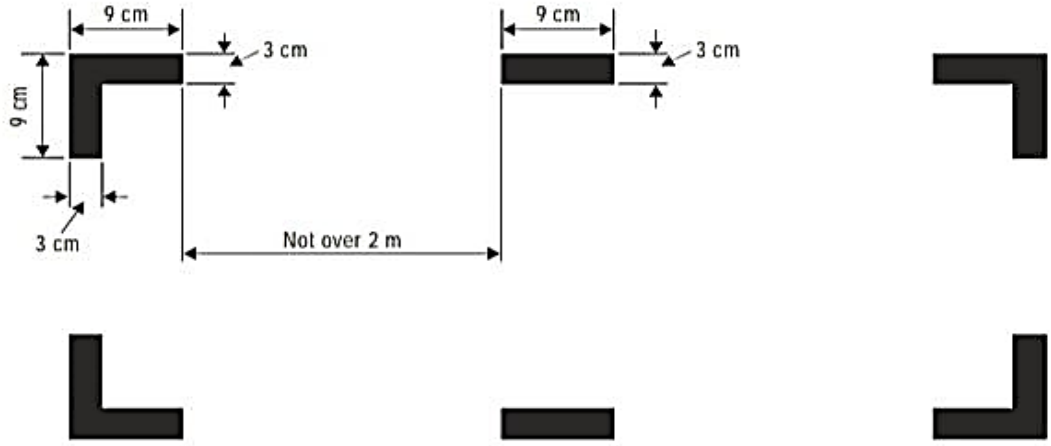
4.2.4 Marking of break-in points

4.2.4.1 If the CAAM requires a helicopter to be marked with break-in points, the operator shall ensure that, if areas of the fuselage suitable for break-in by rescue crews in emergency are marked on a helicopter, such areas shall be marked as shown below (see figure following).

4.2.4.2 In addition to Regulation 96 (1) of the MCAR 2016, the colour of the markings shall be red or yellow and if necessary, they shall be outlined in white to contrast with the background.

4.2.4.3 If the corner markings are more than 2 metres apparat, intermediate lines 9 cm x 3 cm shall be inserted so that there is no more than 2 metres between adjacent marks.

Note.- This Standard does not require any helicopter to have break-in areas.



MARKING OF BREAK-IN POINTS (see 4.2.4)

4.3 Flight recorders

Note 1.- Crash-protected flight recorders comprise one or more of the following systems:

- *a flight data recorder (FDR),*
- *a cockpit voice recorder (CVR),*
- *an airborne image recorder (AIR),*
- *a data link recorder (DLR).*

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 in this CAD.

Note 3.- Detailed requirements on flight recorders are contained in Appendix 4.

Note 4.- Lightweight flight recorders comprise one or more of the following systems:

- *an aircraft data recording system (ADRS),*
- *a cockpit audio recording system (CARS),*
- *an airborne image recording system (AIRS),*
- *a data link recording system (DLRS)*

Image and data link information may be recorded on either the CARS or the ADRS.

Note 5.- For helicopters for which the application for type certification is submitted to a Contracting State before 1 January 2016, specifications applicable to crash-protected flight recorders may be found in EUROCAE ED-112, ED-56A, ED-55, Minimum Operational Performance Specifications (MOPS), or earlier equivalent documents.

Note 6.- For helicopters for which the application for type certification is submitted to a Contracting State on or after 1 January 2016, specifications applicable to crash-

protected flight recorders may be found in EUROCAE ED-112A, Minimum Operational Performance Specification (MOPS), or equivalent documents.

Note 7.- Specifications applicable to lightweight flight recorders may be found in EUROCAE ED-155, Minimum Operational Performance Specification (MOPS), or equivalent documents.

Note 7.- As of 7 November 2019, Chapter 1 contains requirements for States regarding the use of voice, image and/or data recordings and transcripts.

4.3.1 Flight data recorders and aircraft data recording systems

Note - Parameters to be recorded are listed in Table A4-1 of Appendix 4.

4.3.1.1 Applicability

4.3.1.1.1 All helicopters of a maximum certificated take-off mass of over 3175kg 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 A4-1 of Appendix 4.

4.3.1.1.2 All helicopters of a maximum certificated take-off mass of over 7000kg, 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 A4-1 of Appendix 4.

4.3.1.1.3 All helicopters of a maximum certificated take-off mass of over 3175kg, up to and including 7000kg, for which the individual certificate of airworthiness is first issued on or after 1 January 1989, should be equipped with an FDR which should record at least the first 15 parameters listed in Table A4-1 of Appendix 4.

4.3.1.1.4 All turbine-engined helicopters of a maximum certificated take-off mass of over 2250 kg, up to and including 3175 kg for which the application for type certification was submitted to a Contracting State on or after 1 January 2018 shall be equipped with:

a) an FDR which shall record at least the first 48 parameters listed in Table A4-1 of Appendix 4; or

b) a Class C AIR or AIRS which shall record at least the flight path and speed parameters displayed to the pilot(s), as defined in Appendix 4, Table A4-3; or

c) an ADRS which shall record the first 7 parameters listed in Table A4-3 of Appendix 4.

Note - 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.

4.3.1.1.5 All helicopters of a maximum certificated take-off mass of 3175kg or less for which the individual certificate of airworthiness is first issued on or after 1 January 2018 should be equipped with:

a) an FDR which should record at least the first 48 parameters listed in Table A4-1 of Appendix 4; or

b) a Class C AIR or AIRS which should record at least the flight path and speed parameters displayed to the pilot(s), as defined in Appendix 4, Table A4-3; or

c) an ADRS which should record the first 7 parameters listed in Table A4-3 of Appendix 4.

Note - AIR or AIRS classification is defined in 4.1 of Appendix 4.

4.3.1.1.6 All helicopters of a maximum certificated take-off mass of over 3175kg for which the application for type certificate is submitted to a Contracting State on or after 1 January 2023 shall be equipped with an FDR capable of recording at least the first 53 parameters listed in Table A4-1 of Appendix 4.

4.3.1.1.7 All helicopters of a maximum certificated take-off mass of over 3175 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2023 should be equipped with an FDR capable of recording at least the first 53 parameters listed in Table A4-1 of Appendix 4.

4.3.1.2 Recording technology

4.3.1.2.1 FDRs, ADRS, AIRs or AIRS shall not use engraving metal foil, frequency modulation (FM), photographic film or magnetic tape.

4.3.1.3 Duration

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

4.3.2 Cockpit voice recorders and cockpit audio recording systems

4.3.2.1 Applicability

4.3.2.1.1 All helicopters of a maximum certificated take-off mass of over 7000kg shall be equipped with a CVR. For helicopters not equipped with an FDR, at least main rotor speed shall be recorded on the CVR.

4.3.2.1.2 All helicopters of a maximum certificated take-off mass of over 3175kg for which the individual certificate of airworthiness is first issued on or after 1 January 1987 should be equipped with a CVR. For helicopters not equipped with an FDR, at least main rotor speed should be recorded on the CVR.

4.3.2.2 Recording technology

4.3.2.2.1 CVRs and CARS shall not use magnetic tape or wire.

4.3.2.3 Duration

4.3.2.3.1 All helicopters required to be equipped with a CVR, shall be equipped with a CVR which shall retain the information recorded during at least the last two hours of its operation.

4.3.3 Data link recorders

4.3.3.1 Applicability

4.3.3.1.1 All helicopters for which the individual certificate of airworthiness is first issued on or after 1 January 2016, which utilise any of the data link communications applications listed in 5.1.2 of Appendix 4 and are required to carry a CVR, shall record the data link communications messages on a crash protected flight recorder.

4.3.3.1.2 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 1 January to use any of the data communications applications listed in 5.1.2 of Appendix 4 shall record the data link communication messaged 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 G-4 in attachment G 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)

4.3.3.1.3 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 use any of the data link communications applications referred to in 5.1.2 of Appendix 4 should record the data link communications messages on a crash-protected flight recorder.

4.3.3.2 Duration

4.3.3.2.1 The minimum recording duration shall be equal to the duration of the CVR.

4.3.3.3 Correlation

4.3.3.3.1 Data link recording shall be able to be correlated to the recorded cockpit audio.

4.3.4 Flight recorders — general

4.3.4.1 Construction and installation

4.3.4.1.1 Flight recorders shall be constructed, located and installed so as to provide maximum practical protection for the recordings in order that the recorded information may be preserved, recovered and transcribed. Flight recorders shall meet the prescribed crashworthiness and fire protection specifications.

4.3.4.2 Operation

4.3.4.2.1 Flight recorders shall not be switched off during flight time.

4.3.4.2.2 To preserve flight recorder records, flight recorders shall be deactivated upon completion of flight time following an accident or incident. The flight recorders shall not be reactivated before their disposition as determined in accordance with CAD 13.

Note 1 - The need for removal of the flight recorder records from the aircraft will be determined by the investigation authority in the State conducting the investigation with due regard to the seriousness of an occurrence and the circumstances, including the impact on the operation.

Note 2 - The operator's responsibilities regarding the retention of flight recorder records are contained in Section II, Chapter 9, 9.6.

4.3.4.3 Continued serviceability

4.3.4.3.1 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 4.

4.3.4.4 Flight recorders electronic documentation

4.3.4.4.1 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 operated under VFR and IFR - by day and night

Note - The flight instruments requirements in 4.4.1, 4.4.2 and 4.4.3 may be met by combinations of instruments or by electronic displays.

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

a) A magnetic direction indicator.

b) An accurate time-piece showing the time in hours, minutes, and seconds.

c) A sensitive pressure altimeter calibrated in feet with a sub-scale setting, calibrated in hectopascals/millibars, adjustable for any barometric pressure likely to be set during flight.

d) An airspeed indicator calibrated in knots.

e) A vertical speed indicator.

f) A slip indicator.

g) A means of indicating in the flight crew compartment the outside air temperature calibrated in degrees Celcius.

h) Whenever two pilots are required the second pilot's station shall have separate instruments as follows:

1) A sensitive pressure altimeter calibrated in feet with a sub-scale setting calibrated in hectopascals/millibars, adjustable for any barometric pressure likely to be set during flight;
2) An airspeed indicator calibrated in knots;
3) A vertical speed indicator; and
4) A slip indicator.

i) In addition to the flight and navigational equipment required by sub-paragraphs (1) to (8) above, helicopters with a maximum certificated take-off mass (MCTOM) over 3175 kg or any helicopter operating over water, when out of sight of land or when the visibility is less than 1500m, must be equipped with the following flight instruments.

1) An attitude indicator; and
2) A gyroscopic direction indicator.

j) Whenever duplicate instruments are required, the requirement embraces separate displays for each pilot and separate selectors or other associated equipment where appropriate.

k) All helicopters must be equipped with means for indicating when power is not adequately supplied to the required flight instruments; and

l) Each airspeed indicating system must be equipped with a heated pitot tube or equivalent means for preventing malfunction due to either condensation or icing for helicopters with a maximum certificated take-off mass (MCTOM) over 3175 kg or having a maximum approved passenger seating configuration of more than 9.

4.4.2 All 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 heading indicator (directional gyroscope);

d) such additional instruments or equipment as may be prescribed by the appropriate authority; and the following lights:

e) the lights required by CAD 2 for aircraft in flight or operating on the movement area of a heliport;

f) Note.- The general characteristics of lights are specified in CAD 8.

g) two landing lights;

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

i) lights in all passenger compartments; and

j) 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 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 direction indicator.

b) An accurate time-piece showing the time in hours, minutes and seconds.

c) Two sensitive pressure altimeters calibrated in feet, with sub-scale settings calibrated in hectopascals/ millibars, adjustable for any barometric pressure likely to be set during flight. For single pilot night VFR operations one pressure altimeter may be substituted by a radio altimeter.

d) An airspeed indicating system with heated pitot tube or equivalent means for preventing malfunctioning due to either condensation or icing including an annunciation of pitot heater failure. The pitot heater failure annunciation indication requirement does not apply to those helicopters with a maximum approved passenger seating configuration of 9 or less or a maximum certificated take-off mass (MCTOM) of 3175 kg or less and issued with an individual Certificate of Airworthiness prior to 1 August 1999.

e) A vertical speed indicator.

f) A slip indicator.

g) An attitude indicator.

h) A single standby attitude indicator (artificial horizon) capable of being used from either pilot's station that:

1) Provides reliable operation for a minimum of 30 minutes or the time required to fly to a suitable alternate landing site when operating over hostile terrain or offshore, whichever is the greater, after total failure of the normal electrical generating system, taking into account other loads on the emergency power supply and operational procedures.
2) Operates independently of any other attitude indicating system.
3) Is operative automatically after total failure of the normal electrical generating system; and
4) Is appropriately illuminated during all phases of operation.

i) In complying with sub-paragraph h) above, it must be clearly evident to the flight crew when the standby attitude indicator, required by that paragraph, is being operated by emergency power. Where the standby attitude indicator has its own dedicated power supply there shall be an associated indication clearly visible when this supply is in use.

j) A gyroscopic direction indicator for VFR night and a magnetic gyroscopic direction indicator for IFR.

k) A means of indicating in the flight crew compartment the outside air temperature calibrated in degrees Celsius, and

l) An alternate source of static pressure for the altimeter and the airspeed and vertical speed indicators; and

m) Whenever two pilots are required the second pilot's station shall have separate instruments as follows:

1) A sensitive pressure altimeter calibrated in feet with a sub-scale setting, calibrated in hectopascals/millibars, adjustable for any barometric pressure setting likely to be encountered during flight which may be one of the two altimeters required by sub-paragraph (3) above.
2) An airspeed indicating system with heated pitot tube or equivalent means for preventing malfunctioning due to either condensation or icing including an annunciation of pitot heater failure. The pitot heater failure annunciation requirement does not apply to those helicopters with a maximum approved passenger seating configuration of 9 or less or a maximum certificated take-off mass (MCTOM) of 3175 kg or less and issued with an individual Certificate of Airworthiness prior to 1 August 1999.
3) A vertical speed indicator.
4) A slip indicator.
5) An attitude indicator; and
6) A gyroscopic direction indicator for VFR night and a magnetic gyroscopic direction indicator for IFR.

n) For IFR operations, a chart holder in an easily readable position which can be illuminated for night operations.

o) Whenever duplicate instruments are required, the requirement shall have separate displays for each pilot and separate selectors or other associated equipment where appropriate; and

p) All helicopters must be equipped with means for indicating when power is not adequately supplied to the required flight instruments.

q) A stabilisation 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;

r) such additional instruments or equipment as may be prescribed by the appropriate authority; and

s) if operated at night, the lights specified in 4.4.2e) to i) and 4.4.2.1.

4.4.3.1 All 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 A helicopter when operating in accordance with IFR and which has a maximum certificated take-off mass in excess of 3175kg or a maximum passenger seating configuration of more than 9 should be equipped with a ground proximity warning system which has a forward-looking terrain avoidance function.

4.4.4.1 When undue proximity to the ground is detected by a flight crew member or by a ground proximity warning system, the pilot flying shall take corrective action immediately to establish safe flight conditions.

4.4.5 Additional equipment for single pilot operation under IFR

4.4.5.1 An operator shall not conduct single pilot IFR operations unless the helicopter is equipped with an autopilot with, at least, altitude hold and heading mode, except for helicopters with a maximum approved passenger seating configuration of 6 or less first certificated for single pilot IMC operations on or before 1 January 1979.

4.4.6 Helicopter operating lights

4.4.6.1 An operator shall not operate a helicopter unless it is equipped with:

a) For flight by day under VFR:

1) Anti-collision light system.

b) For flight under IFR or by night, in addition to equipment specified in subparagraph (a) above:

1) Lighting supplied from the helicopter's electrical system to provide adequate illumination for all instruments and equipment essential to the safe operation of the helicopter; and

2) Lighting supplied from the helicopter's electrical system to provide illumination in all passenger compartments; and

3) An electric torch for each required crew member readily accessible to crew members when seated at their designated station; and

4) Navigation/position lights; and

5) Two landing lights of which at least one is adjustable in flight so as to illuminate the ground in front of and below the helicopter and the ground on either side of the helicopter; and

6) Lights to conform with the International regulations for preventing collisions at sea if the helicopter is amphibious.

4.4.6.2 Emergency lighting

4.4.6.2.1 An operator shall not operate a helicopter which has a maximum approved passenger seating configuration of more than 19 unless it is equipped with:

a) An emergency lighting system having an independent power supply to provide a source of general cabin illumination to facilitate the evacuation of the helicopter; and

b) Illuminated emergency exit marking and locating signs.

4.5 All helicopters on flights over water

4.5.1 Means of flotation

4.5.1.1 All 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 CAAM; 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

Note - When operating in a hostile environment, a safe ditching requires a helicopter to be designed for landing on water or certificated in accordance with ditching provisions.

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

Note - When considering the distance beyond which flotation equipment is required, the State should take into consideration the certification standard of the helicopter.

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 Helicopters operating in performance Class 1 or 2 and operating in accordance with the provisions of 4.5.1 shall be equipped with:

a) one life jacket, or equivalent individual flotation device, equipped with a survivor locator light, 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. In the case of a helicopter carrying less than 12 persons, a minimum of one life-raft with a rated capacity of not less than the maximum number of persons on board;

c) when two life rafts are fitted, each shall be able to carry all occupants in the overload state. In the case of a helicopter carrying more than 11 persons, a minimum of two life-rafts sufficient together to accommodate all persons capable of being carried on board;

d) equipment for making the pyrotechnical distress signals described in CAD 2.

e) Emergency exit markings and illumination; and

f) Lifesaving equipment including means of sustaining life as appropriate to the flight to be undertaken.

Note - The life raft overload state has a design safety margin of 1.5 times the maximum capacity.

4.5.2.2 Helicopters operating in performance Class 3 when operating beyond autorotational distance from land but within a distance from land specified by the appropriate authority of the responsible State shall be equipped with one life jacket, or equivalent individual flotation device, equipped with a survivor

locator light, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided.

Note - When determining the distance from land referred to in 4.5.2.2, consideration should be given to environmental conditions and the availability of search and rescue facilities.

4.5.2.2.1 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.

4.5.2.3 Helicopters operating in performance Class 3 when operating beyond the distance specified in 4.5.2.2, or operate a flight over water at a distance from land corresponding to more than 3 minutes flying time at normal cruising speed, shall be equipped as in 4.5.2.1.

4.5.2.4 In the case of helicopters operating in performance Class 2 or 3, when taking off or landing at a heliport where, in the opinion of CAAM, 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, at least the equipment required in 4.5.2.1 a) shall be carried.

4.5.2.5 Each life jacket and equivalent individual flotation device, when carried in accordance with 4.5, shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons.

4.5.2.6 On any helicopter for which the individual certificate of airworthiness is first issued on or after 1 January 1991, at least 50 per cent of the life rafts carried in accordance with the provisions of 4.5.2 should be deployable by remote control.

4.5.2.7 Rafts which are not deployable by remote control and which have a mass of more than 40kg should be equipped with some means of mechanically assisted deployment.

4.5.2.8 On any helicopter for which the individual certificate of airworthiness was first issued before 1 January 1991, the provisions of 4.5.2.6 and 4.5.2.7 should be complied with no later than 31 December 1992.

4.5.2.9 Helicopters on flights over water shall be equipped with a radio altimeter capable of emitting an audio warning below a pre-set height and a visual warning at a height selectable by the pilot, when operating:

a) out of sight of the land;

b) in a visibility of less than 1 500 m;

c) at night; or

d) at a distance from land corresponding to more than three minutes at normal cruising speed

4.5.3 All helicopters on flights over designated sea areas

4.5.3.1 Helicopters, when operating over sea areas which have been designated by the CAAM as areas in which search and rescue would be especially difficult, shall be equipped with:

a) signalling equipment to make distress signals;

b) at least one ELT(S); and

c) additional survival equipment for the route to be flown taking account of the number of persons on board.

4.5.3.2 In performance Class 1 or 2 on a flight over water in support of offshore operations, at a distance from land corresponding to more than 10 minutes flying time at normal cruising speed, when the weather report or forecasts available to the pilot-in-command indicate that the sea temperature will be less than plus 10 °C during the flight, or when the estimated rescue time exceeds the estimated survival time;

4.5.3.3 In performance Class 3 on a flight over water beyond auto rotational distance or safe forced landing distance from land, when the weather report or forecasts available to the pilot-in-command indicate that the sea temperature will be less than plus 10 °C during the flight.

Note 1.- Additionally, a survival suit should be worn by all occupants when the sea temperature is less than 10°C or when the estimated rescue time exceeds the calculated survival time. When the elevation and strength of the sun results in a high temperature hazard on the flight deck, consideration should be given to alleviating the flight crew from this recommendation.

Note 2.- When establishing rescue time, the sea state and the ambient light conditions should be taken into consideration.

4.6 All helicopters on flights over designated land areas

4.6.1 Helicopters, 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:

a) signalling equipment to make distress signals;

b) at least one ELT(S); and

c) additional survival equipment for the route to be flown taking account of the number of persons on board.

4.7 Emergency Locator Transmitter (ELT)

4.7.1 All helicopters operating in performance Class 1 and 2 shall be equipped with at least one automatic ELT and, when operating on flights over water as described in 4.5.1.1, with at least one automatic ELT and one ELT(S) in a raft or life jacket.

4.7.2 All helicopters operating in performance Class 3 shall be equipped with at least one automatic ELT and, when operating on flights over water as described in 4.5.1.1 d), with at least one automatic ELT and one ELT(S) in a raft or life jacket.

4.7.3 ELT equipment carried to satisfy the requirements of 4.7.1and 4.7.2 shall operate in accordance with the relevant provisions of CAD 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.

4.8 All helicopters on high altitude flights

Note - Approximate altitude in the Standard Atmosphere corresponding to the value of absolute pressure used in this text is as follows:

Absolute pressure	*Meters*	*Feet*
700hPa	*3000*	*10000*
620hPa	*4000*	*13000*
376hPa	*7600*	*25000*

4.8.1 A helicopter intended to be operated at flight altitudes at which the atmospheric pressure is less than 10000 ft in personnel compartments shall be equipped with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in 2.3.8.1.

4.8.2 A helicopter intended to be operated at flight altitudes at which the pressure altitudes more than 10000 ft but which is provided with means of maintaining pressure altitudes less than 10000 ft in personnel compartments shall be provided with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen supplies required in 2.3.8.2.

4.8.3 A helicopter intended to be operated at flight altitudes at which the pressure altitude is more than 25000 ft, or which, if operated at flight altitudes at which the pressure altitude is more than 25000 ft which cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to 13000 ft, and for which the individual certificate of airworthiness was issued on or after 9 November 1998, shall be provided with automatically deployable oxygen equipment to satisfy the requirements of 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.

4.8.4 A helicopter intended to be operated at flight altitudes at which the pressure altitude is more than 25000 ft, or which, if operated at flight altitudes at which the pressure altitude is more than 25000 ft which cannot descend safely within four minutes to a flight altitude at which the atmospheric pressure is equal to 13000 ft, and for which the individual certificate of airworthiness was issued before 9 November 1998, should be provided with automatically deployable oxygen equipment to satisfy the requirements of 2.3.8.2. The total number of oxygen dispensing units should exceed the number of passenger and cabin crew seats by at least 10 per cent.

4.8.5 The amount of supplemental oxygen for sustenance required for a particular operation shall be determined on the basis of flight altitudes and flight duration, consistent with the operating procedures established for each operation in the Operations Manual and with the routes to be flown, and with the emergency procedures specified in the Operations Manual.

4.9 All helicopters in icing conditions

4.9.1 All 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.

4.9.2 An operator shall not operate a helicopter in expected or actual icing conditions at night unless it is equipped with a means to illuminate or detect the formation of ice. Any illumination that is used must be of a type that will not cause glare or reflection that would handicap crew members in the performance of their duties.

4.9.3 If icing exceeds the intensity of icing for which the aircraft is certified or if an aircraft not certified for flight in known icing conditions encounters icing, the pilot-in-command shall exit the icing conditions without delay, by a change of level and/or route, if necessary by declaring an emergency to ATC.

4.10 Helicopters when carrying passengers - significant-weather detection

4.10.1 Helicopters with an maximum approved passenger seating configuration of more than nine and operated under IFR or at night shall be equipped with airborne weather detecting equipment when current weather reports indicate that thunderstorms or other potentially hazardous weather conditions, regarded as detectable with airborne weather detecting equipment, may be expected to exist along the route to be flown.

4.11 All helicopters required to comply with the noise certification standards in CAD 16, Volume I

4.11.1 All helicopters required to comply with the noise certification Standards of CAD 16, Volume I, shall carry a document attesting noise certification. When the document, or a suitable statement attesting noise certification as contained in

another document approved by the State of Registry, is issued in a language other than English, it shall include an English translation.

Note 1 - The attestation may be contained in any document, carried on board, approved by the State of Registry in accordance with the relevant provisions of CAD 16, Volume I.

Note 2 - The various noise certification Standards of CAD 16, Volume I, which are applicable to helicopters are determined according to the date of application for a type certificate, or the date of acceptance of an application under an equivalent prescribed procedure by the certificating authority. Some helicopters are not required to comply with any noise certification Standard. For details see CAD 16, Volume I, Part II, Chapters 8 and 11.

4.12 Helicopters carrying passengers — cabin crew seats

4.12.1 All 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 other emergency exits as required by the State of Registry for emergency evacuation.

4.12.3 If the number of required cabin crew members exceeds the number of floor level emergency exits the additional cabin crew seats required shall be located such that the cabin crew member(s) may best be able to assist passengers in the event of an emergency evacuation.

4.13 Helicopters required to be equipped with a pressure-altitude reporting transponder

4.13.1 Helicopters shall be equipped with a pressure-altitude reporting transponder which operates in accordance with the provisions of CAD 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 / Interphones / Public address system

4.14.1 Whenever a radio communication and/or radio navigation system is required, an operator shall not conduct operations unless the helicopter is equipped with a

headset with boom microphone or equivalent and a transmit button on the flight controls for each required pilot and/or crew member at his working station

4.14.2 Each flight crew member required to be on flight deck duty shall wear the headset with boom microphone or equivalent and use it as the primary device to listen to the voice communications with Air Traffic Services:

a) on the ground:

1) when receiving the ATC departure clearance via voice communication.
2) when engines are running.

b) in flight below transition altitude or 10,000 feet, whichever is higher, and

c) whenever deemed necessary by the pilot-in-command.

4.14.3 In the conditions of paragraph 4.14.1 above, the boom microphone or equivalent shall be in a position which permits its use for two-way radio communications.

4.14.4 Helicopters operated by more than one flight crew member shall be equipped with a flight crew interphone system, including headsets and microphones for use by all flight crew members.

4.14.5 Helicopters shall be equipped with a crew member interphone system when carrying a crew member other than a flight crew member.

4.14.6 Helicopters with an maximum approved passenger seating configuration of more than nine shall be equipped with a public address system, with the exception of 4.14.6.1.

4.14.6.1 Notwithstanding 4.14.6 helicopters with an maximum approved passenger seating configuration of more than nine and less than 20 are exempted from having a public address system, if:

a) the helicopter is designed without a bulkhead between pilot and passengers; and

b) the operator is able to demonstrate that when in flight, the pilot's voice is audible and intelligible at all passengers' seats.

4.14.7 Helicopters operated under IFR shall be equipped with an audio selector panel operable from each required flight crew member station.

4.15 Vibration health monitoring system

4.15.1 Notwithstanding 2.12.12.2, a helicopter which has a maximum certificated take-off mass in excess of 3175kg or a maximum passenger seating configuration of more than 9 should be equipped with a vibration health monitoring system.

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 State of the Operator.

Note .- Information regarding a HUD or equivalent displays, including references to RTCA and EUROCAE documents, is contained in the Manual of All-Weather Operations (ICAO Doc 9365).

Note 2.- Automatic landing system. Helicopter is an automatic approach using airborne systems which provide automatic control of the flight path, to a point aligned with the landing surface, from which the pilot can transition to a safe landing by means of natural vision without the use of automatic control.

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

a) the equipment meets the appropriate airworthiness certification requirements;

b) the operator has carried out a safety risk assessment of the operations supported by the 1automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS; and

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

Note 1.- Guidance on safety risk assessments is contained in the Safety Management Manual (SMM) (ICAO Doc 9859).

Note 2.- Guidance on operational approvals is contained in Attachment G.

4.17 Electronic flight bags (EFBS)

4.17.1 EFB equipment

4.17.1.1 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

4.17.2.1 Where EFBs are used on board an helicopter the operator shall:

a) assess the safety risk(s) associated with each EFB function;

b) establish and document the procedures for the use of, and training requirements for, the device and each EFB function; and

c) ensure that, in the event of an EFB failure, sufficient information is readily available to the flight crew for the flight to be conducted safely.

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

4.17.2.2 The operational use of EFB functions to be used for the safe operation of helicopters shall be approved by the CAAM.

4.17.2.3 An operator with a specific approval to use an EFB during its operations must not in any of its operations:

a) use a new EFB or a new function in such equipment; or

b) use an amended EFB or amended function in such equipment.

until the operator has obtained CAAM's approval for such variation to the specific approval

4.17.3 EFB operational approval

4.17.3.1 To obtain a CAAM approval for the use of EFBs, 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) the safety risks assessment associated with the operations supported by the EFB function(s) has been carried out;

c) requirements have been established for redundancy of the information (if appropriate) contained in and displayed by the EFB function(s);

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

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

4.17.3.2 If the CAAM is satisfied that the operator has fulfilled the requirements, the CAAM may issue an initial approval which include flight crew training, checking and currency requirements.

4.17.3.3 The initial approval shall be for a period of 6 months.

4.17.3.4 During the period of 6 months, the operator shall conduct an operational evaluation. This operational evaluation requires the operator to carry both the EFB system and paper copies before the final approval, allowing the EFB to reduce or eliminate paper copies on the flight deck

4.17.3.5 The operator shall submit a final report to the CAAM after the 6 month evaluation period of the EFB system.

4.17.3.6 If the CAAM is satisfied that the operator has fulfilled the requirements, the CAAM may issue a final approval in the Operational Specifications or Letter of Approval.

4.17.4 Continuing airworthiness and training for maintenance personnel.

4.17.4.1 The operator shall establish a documented maintenance procedure to ensure the EFB is well maintained.

4.17.4.2 For the rechargeable lithium-type batteries, the operator shall ensure that the maintenance procedures meet the Original Equipment Manufacturer (OEM)'s recommendations.

4.17.4.3 The operator shall review and update the following documents to reflect the operation of EFB as applicable:

a) Maintenance program

b) Minimum Equipment List (MEL); and

c) Aircraft Flight Manual Supplement (AFMS).

4.17.4.4 The operator shall develop a training program for all the maintenance personnel who are involved with the EFB operations. The training program shall consist of initial and recurrent training and include at least the overview of the EFB specificities, maintenance procedures and safety management. The operator shall regularly review the training program to ensure that the training program is relevant with the current technologies and effectively implemented.

Note – Guidance on EFB equipment, functions and operational approval is contained in the CAGM 6008(V) – EFB and ICAO Doc 10020.

4.18 Night Vision Imaging Systems (NVIS)

4.18.1 Night vision imaging system (NVIS) operations

4.18.1.1 Helicopters shall only be operated under VFR at night with the aid of NVIS if the operator has been approved by CAAM

4.18.1.2 To obtain such approval by the competent authority, the operator shall:

a) operate in commercial air transport (CAT) and hold a AOC in accordance with this CAD;

b) demonstrate to CAAM:

1) compliance with the applicable requirements contained in this CAD; and

2) the successful integration of all elements of the NVIS.

4.18.2 Equipment requirements for NVIS operations

4.18.2.1 Before conducting NVIS operations, the operator shall ensure:

a) each helicopter and all associated NVIS equipment has been approved by CAAM to be airworthy;

b) Radio altimeter. The helicopter shall be equipped with a radio altimeter capable of emitting an audio warning below a pre-set height and an audio and visual warning at a height selectable by the pilot, instantly discernable during all phases of NVIS flight.

c) Aircraft NVIS compatible lighting. To mitigate the reduced peripheral vision cues and the need to enhance situational awareness, the following shall be provided:

1) NVIS-compatible instrument panel flood-lighting, if installed, that can illuminate all essential flight instruments;

2) NVIS-compatible utility lights;

3) portable NVIS compatible flashlight; and

4) a means for removing or extinguishing internal NVIS noncompatible lights;

d) Additional NVIS equipment. The following additional NVIS equipment shall be provided:

1) a back-up or secondary power source for the night vision goggles (“NVG”); and

2) a helmet with the appropriate NVG attachment;

e) all required NVGs on an NVIS flight are of the same type, generation and model;

1) procedures for continuing airworthiness contain the information necessary for carrying out ongoing maintenance and inspections on NVIS equipment installed in the helicopter and shall cover, as a minimum:

i) helicopter windscreens and transparencies;
ii) NVIS lighting;
iii) NVGs; and
iv) any additional equipment that supports NVIS operations; and

f) Any subsequent modification or maintenance to the aircraft shall be approved by CAAM

4.18.3 NVIS operating minima

4.18.3.1 The operator shall:

a) ensure that no operations are conducted below the VFR weather minima; and

b) establish the minimum transition height from where a change to/from aided flight may be continued.

4.18.4 Crew requirements for NVIS operations

4.18.4.1 Selection. The operator shall establish criteria for the selection of crew members for the NVIS task.

4.18.4.2 Experience. The minimum experience for the pilot-in-command shall not be less than 20 hours VFR at night as pilot-in-command of a helicopter before commencing training.

4.18.4.3 Operational training. All pilots shall have completed the operational training in accordance with the NVIS procedures contained in the operations manual.

4.18.4.4 Recency. All pilots and NVIS technical crew members conducting NVIS operations shall have completed three NVIS flights in the last 90 days. Recency may be re-established on a training flight in the helicopter or an approved full flight simulator (FFS), which shall include the elements of 4.18.4.6 a).

4.18.4.5 Crew composition. The minimum crew shall be the greater of that specified:

a) in the aircraft flight manual (“AFM”);

b) for the underlying activity; or

c) in the operational approval for the NVIS operations;

4.18.4.6 Crew training and checking

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

b) Crew members

1) Crew training programmes shall: improve knowledge of the NVIS working environment and equipment; improve crew coordination; and include measures to minimise the risks associated with entry into low visibility conditions and NVIS normal and emergency procedures.

2) The measures referred to in 4.18.4.6 1)shall be assessed during:

i) night proficiency checks; and
ii) line checks.

4.18.4.7 Ensure that crew training programmes shall improve knowledge of the NVIS working environment and equipment; improve crew coordination; and include measures to minimise the risks associated with entry into low visibility conditions and NVIS normal and emergency procedures.

4.18.4.8 For avoidance of doubt, the “measures” referred to in this paragraph shall be assessed during:

a) night proficiency checks; and

b) line checks.

4.18.5 Information and documentation

4.18.5.1 The operator shall ensure that, as part of its risk analysis and management process, risks associated with the NVIS environment are minimised 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.

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5 Helicopter Communication, Navigation and Surveillance Equipment

5.1 Communication equipment

5.1.1 A 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 5.1.1 shall provide for communications on the aeronautical emergency frequency 121.5MHz, and shall comply with the applicable airspace requirements.

5.1.3 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 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 State of Design or State of Registry; 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 the Performance-based Communication and Surveillance (PBCS) Manual (ICAO Doc 9869).

5.1.4 The operator shall, for operations where an RCP specification for PBC has been prescribed, ensure that they established and document the following:

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.

5.1.5 With respect to those helicopters mentioned in 5.1.3, the CAAM will:

a) receive the reports of observed communication performance issued by monitoring programmes established in accordance with CAD 11, Chapter 3, 3.3.5.2; and

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

5.1.6 Radio equipment for operations under VFR over routes navigated by reference to visual landmarks.

5.1.6.1 Helicopters operated under VFR over routes that can be navigated by reference to visual landmarks shall be equipped with radio communication equipment necessary under normal radio propagation conditions to fulfil the following:

a) communicate with appropriate ground stations;

b) communicate with appropriate ATC stations from any point in controlled airspace within which flights are intended; and

c) receive meteorological information.

5.1.7 Communication and navigation equipment for operations under IFR or under VFR over routes not navigated by reference to visual landmarks.

a) Helicopters operated under IFR or under VFR over routes that cannot be navigated by reference to visual landmarks shall be equipped with radio communication and navigation equipment in accordance with the applicable airspace requirements.

b) Radio communication equipment shall include at least two independent radio communication systems necessary under normal operating conditions to communicate with an appropriate ground station from any point on the route, including diversions.

c) Helicopters shall have sufficient 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 shall allow safe navigation in accordance with the flight plan.

d) Helicopters operated on flights in which it is intended to land in IMC shall be equipped with suitable equipment capable of providing guidance to a point from which a visual landing can be performed for each aerodrome at which it is intended to land in IMC and for any designated alternate aerodromes.

e) For PBN operations the aircraft shall meet the airworthiness certification requirements for the appropriate navigation specification.

5.2 Navigation equipment

5.2.1 A 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 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 State of Registry; and

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

d) identify the particular helicopter to be used for the PBN operations;

e) specify the composition and experience requirement of the flight crew for a flight involving the PBN operations;

f) provide details of:

1) provide details of:
2) incident reporting procedures;
3) training programme for every person to be involved in the PBN operations as a flight crew member or a member of the operations personnel;
4) to have a continuous monitoring programme to ensure the required level of navigation performance is maintained;
5) the procedure to ensure that these requirements are met.

g) Airworthiness review - For the purpose of granting an operational approval for an aircraft to be operated in the PBN airspace, airworthiness recommendation is required. Applicant shall submit an Engineering Report which contains:

1) particulars of aircraft to be operated;
2) navigation equipment which will enable it to operate in accordance with the intended navigation specifications;
3) information relevant to the aircraft eligibility and evidence of compliance with the navigation specifications for a particular PBN application provided there is clear statement in:-

i) the Type Certificate (TC); or

ii) the Supplemental Type Certificate (STC); or
iii) the compliance statement from the manufacturer that has been approved by the State of Design and accepted by the CAAM.

4) the aircraft configuration list detailing the installation of the pertinent hardware and software components related to the PBN operation;
5) the control of navigation database procedures which will define the data validation procedures for navigation databases and installation of new databases into aircraft so that they remain current with the Aeronautical Information Regulation and Control (AIRAC) cycle
6) the training programme for personnel involved in the PBN operations;
7) continued airworthiness procedures for assessing and incorporating instructions for continued airworthiness and maintenance or inspection information concerning system modification, software revisions, etc;
8) the aircraft's Aircraft Maintenance Programme (AMP), Reliability Programme and Minimum Equipment List (MEL) had been incorporated with the relevant PBN elements and systems;
9) the aircraft current and updated Electrical Load Analysis; and
10) the completed checklist for PBN Airworthiness Assessment Review - Performance Based Navigation (PBN).

h) The applicant shall ensure that aircraft system is properly maintained to meet the appropriate navigation specifications.

i) No applicants shall conduct any modifications, or repairs on the aircraft which may impact the PBN related capability and systems.

j) The operator In the case of modifications, or repairs that give impact to the PBN related capability and systems, the applicant shall inform CAAM on the changes made and provide information to ensure that the PBN related capability and systems is in compliance to this CAD.

5.2.3 An operator with a specific approval to conduct a PBN operations must ensure that the aircraft used to conduct the PBN operation have flight crew members that:

a) are of the composition and experience required for such operations; and

b) have completed the training programme established in 7.2.2 f) 3) for every flight crew member involved in such operations.

5.2.4 An operator with a specific approval to conduct PBN operations must ensure that, when its aircraft is used to conduct a PBN operations, the flight crew comprises of at least 2 pilots.

5.2.5 The operator shall, for operations where navigation specification for PBN has been prescribed, ensure that they 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 CAD 19, are contained in the Performance-based Navigation (PBN) Operational Approval Manual (ICAO Doc 9997).

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

5.2.6 Operators shall seek a specific approval from the CAAM for operations based on PBN authorisation required (AR) navigation specifications.

Note 1.- Information on performance-based navigation, and guidance concerning the implementation and operational approval process, are contained in CAGM 6008 (II) Performance-based Navigation (PBN) Manual and ICAO Doc 9613.

5.2.7 The 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 5.2.1 and, where applicable, 5.2.2.

5.2.8 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 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 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 (ICAO Doc 9924).

Note 2.- Information on RSP specifications for performance-based surveillance is contained in the Performance-based Communication and Surveillance (PBCS) Manual (ICAO Doc 9869).

5.3.3 The operator shall, for operations where an RSP specification for PBS has been prescribed, ensure that they have 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

e) accordance with appropriate RSP specifications.

5.3.4 With respect to those helicopters mentioned in 5.3.2, the CAAM will:

a) receive the reports of observed surveillance performance issued by monitoring programmes established in accordance with CAD 11, Chapter 3, 3.3.5.2; and

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

5.4 Installation

5.4.1 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 shall not employ electronic navigation data products that have been processed for application in the air and on the ground, unless CAAM 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 shall implement procedures that ensure the timely distribution and insertion of current and unaltered electronic navigation data to all necessary aircraft.

5.5.3 The operator shall report to the database provider instances of erroneous, inconsistent or missing data that might be reasonably expected to constitute a hazard to flight. In such cases, the operator shall inform flight crew and other personnel concerned, and shall ensure that the affected data is not used.

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6 Helicopter Continuing Airworthiness

6.1 Operator's continuing airworthiness responsibilities

6.1.1 Operators shall ensure that:

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.

6.1.2 The operator shall not operate a helicopter unless maintenance on the helicopter, including any associated engine, rotor and part, is carried out:

a) by an organisation complying with CAD 8601, or

b) for foreign registered aircraft, under lease arrangement in accordance with CAD 6014 and there is a maintenance release in relation to the maintenance carried out.

6.1.3 The operator shall employ a person or group of persons to ensure that all maintenance is carried out in accordance with the continuing airworthiness management exposition.

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

Note. – Refer CAD 6801 Continuing Airworthiness of Aircraft (CAAM Part M)

6.2 Continuing airworthiness management exposition

6.2.1 The operator shall provide, for the use and guidance of maintenance and operational personnel concerned, a continuing airworthiness management exposition, acceptable to the CAAM, in accordance with the requirements of 9.2 . The design of the manual shall observe Human Factors principles.

Note - Guidance material on the application of Human Factors principles can be found in the Human Factors Training Manual (ICAO Doc 9683).

6.2.2 The operator shall ensure that the continuing airworthiness management exposition is amended as necessary to keep the information contained therein up to date.

6.2.3 Copies of all amendments to the continuing airworthiness management exposition shall be furnished promptly to all organisations or persons to whom the manual has been issued.

6.2.4 The operator shall provide the State of the Operator and the State of Registry with a copy of the continuing airworthiness management exposition, together with all

amendments and/or revisions to it and shall incorporate in it such mandatory material as the CAAM or the State of Registry may require.

Note. – Refer to CAD 6802 Continuing Airworthiness Management Organisation (CAAM Part M Subpart G)

6.3 Maintenance programme

6.3.1 The operator shall provide, for the use and guidance of maintenance and operational personnel concerned, a maintenance programme, approved by the State of Registry, containing the information required by 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 organisations or persons to whom the maintenance programme has been issued.

6.4 Continuing airworthiness records

6.4.1 The operator shall ensure that the following records are kept for the periods mentioned in 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 current 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 (hours, calendar time and cycles, as appropriate) since last overhaul of the helicopter or its components subject to a mandatory overhaul life;

e) the current 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 6.4.1 a) to f) shall be kept for a minimum period of 12 months after the unit to which they refer has been permanently withdrawn from service.

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 Records kept and transferred in accordance with 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 a helicopter over 3175 kg maximum mass shall monitor and assess maintenance and operational experience with respect to continuing airworthiness and provide the information as prescribed by the CAAM and report through the system specified in CAD 1900.

6.5.2 The operator of a helicopter over 3175 kg maximum mass shall obtain and assess continuing airworthiness information and recommendations available from the organisation responsible for the type design and shall implement resulting actions considered necessary in accordance with a procedure acceptable to the CAAM.

6.6 Modifications and repairs

6.6.1 All modifications and repairs shall comply with airworthiness requirements acceptable to the State of Registry. Procedures shall be established to ensure that the substantiating data supporting compliance with the airworthiness requirements are retained.

6.7 Maintenance release

6.7.1 When maintenance is carried out by an approved maintenance organisation, the maintenance release shall be issued by the approved maintenance organisation in accordance with the provisions of CAD 8, Part II, Chapter 6.

6.7.2 For foreign registered aircraft, the maintenance release shall be issued by the approved maintenance organisation in accordance with the provisions of Annex 8, Part II, Chapter 6.

6.8 Records

6.8.1 The operator 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 12 months after the end of the operating life of the unit to which they refer.

7 Helicopter Flight Crew

7.1 Composition of the flight crew

7.1.1 An operator shall ensure that:

7.1.1.1 The composition of the flight crew and the number of flight crew members at designated crew stations are both in compliance with, and no less than the minimum specified in, the Helicopter Flight Manual.

7.1.1.2 The flight crew includes additional flight crew members when required by the type of operation, and is not reduced below the number specified in the Operations Manual.

7.1.1.3 All flight crew members hold an applicable and valid licence acceptable to the CAAM and are suitably qualified and competent to conduct the duties assigned to them.

7.1.1.4 Procedures are established, acceptable to the CAAM, to prevent the crewing together of inexperienced flight crew members; (See the provisions in Paragraph 7.1.3, and

7.1.1.5 One pilot amongst the flight crew is designated as the pilot-in-command who may delegate the conduct of the flight to another suitably qualified pilot.

7.1.1.6 When engaging the services of crew members from other organisation or other individuals, there shall be an agreement in place to ensure the legal aspects are covered and the relevant requirements are complied with.

7.1.1.7 In this respect, particular attention must be paid to the total number of helicopter types or variants that a flight crew member may fly for the purposes of commercial air transportation, which must not exceed the requirements prescribed in the provisions in 7.1.4, including when his services are engaged by another operator.

7.1.1.8 For crew members serving the operator as a pilot-in-command, initial operator's Crew Resources Management (CRM) training shall be completed before commencing unsupervised line flying. However, for crew members serving the operator as a pilot-in-command, initial CRM training shall be completed before commencing unsupervised line flying unless the crew member has previously completed an initial operator's CRM course.

7.1.1.9 For crew members serving the operator as a pilot-in-command, initial operator's Crew Resource Management (CRM) training shall be completed before commencing unsupervised line flying.

7.1.2 An operator shall ensure that:

7.1.2.1 The flight crew shall include at least one member authorised by the CAAM to operate the type of radio transmitting equipment to be used.

7.1.2.2 pilot-in-command s and co-pilots on an IFR flight hold a valid instrument rating, except that the holder of a pilot licence may fly in VMC at night, provided he is appropriately qualified for the circumstances, airspace and flight conditions in which the flight is conducted. This qualification requirement must be entered in the Operations Manual and be acceptable to the CAAM.

7.1.2.3 For IFR operations using helicopters with a maximum approved passenger seating configuration of more than 9 or any helicopter operating hostile environment:

a) The minimum flight crew is two qualified pilots; and

b) the pilot-in-command holds a valid Airline Transport Pilot's Licence (Helicopter) (ATPL(H)) with instrument rating, whilst the co-pilot holds an applicable valid licence with instrument rating.

7.1.2.4 For operations using helicopters with a maximum approved passenger seating configuration of more than 19:

a) The minimum flight crew is two qualified pilots.

b) The pilot-in-command holds a valid Airline Transport Pilot's Licence (Helicopter) (ATPL(H)) with instrument rating, whilst the co-pilot holds an applicable valid licence with instrument rating.

7.1.2.5 Helicopters not covered by sub-paragraph 7.1.2.3, and 7.1.2.4 above may be operated by a single pilot provided that the requirements of Paragraph 7.1.5are satisfied.

7.1.3 Crewing of inexperienced flight crew members.

7.1.3.1 An operator shall ensure that when two flight crew members are required, a flight crew member, following completion of a Type Rating or pilot-in-command course, and the associated line flying under supervision, is inexperienced until either:

a) He has achieved 50 flight hours on the type and/or in the role within a period of 60 days; or

b) He has achieved 100 flight hours on the type and/or in the role (no time limit).

7.1.3.2 A lesser number of flight hours, on the type and/or in the role, may be acceptable to the CAAM when:

a) A new operator is commencing operations; or

b) An operator introduces a new helicopter type; or

c) Flight crew members have previously completed a type conversion course with the same operator (re-conversion); and

d) Subject to any other conditions which the CAAM may impose.

7.1.4 Operation on more than one type or variant.

7.1.4.1 An operator shall ensure that a flight crew member does not operate more than one type or a variant unless:

a) The flight crew member is competent to do so.

b) Appropriate procedures, approved by the CAAM are included in the Operations Manual for any operation on more than one type or variant.

7.1.4.2 When considering operations of more than one type or variant, an operator shall ensure that the differences and/or similarities of the aircrafts concerned justify such operations, taking account of the following:

a) The level of technology.

b) Operational procedures.

c) Handling characteristics.

7.1.4.3 An Operator shall ensure that a flight crew member operating more than one type or variant complies with all of the requirements for each type or variant unless the CAAM has approved the use of credit(s) related to the training, checking and recent experience requirements.

7.1.5 Single pilot operations under IFR or at night.

7.1.5.1 In addition to 4.4.5 helicopters may be operated by a single pilot under IFR or at night when the following requirements are satisfied:

a) The operator shall include in the Operations Manual a pilot's conversion and recurrent training programme which includes the additional requirements for a single pilot operation.

b) Training and Recency. Attention shall be given to cockpit procedures, especially in respect of:

1) Engine management and emergency handling.

2) Use of normal, abnormal and emergency checklist.

3) ATC communication.

4) Departure and approach procedures.

5) Autopilot management, if applicable; and

6) Use of simplified in-flight documentation.

7) Single-pilot crew resource management.

c) The recurrent checks required by the provisions in 7.3.5 shall be performed in the single-pilot role on the particular helicopter type in an environment representative of the operation.

d) For IFR operations, the pilot shall have experience as follows:

1) 25 hours total IFR flight experience in the relevant operating environment.

2) 25 hours flight experience on the specific type of helicopter, approved for single pilot IFR, of which 10 hours is as pilot-in-command or pilot-in-command under supervision, including 5 sectors of IFR line flying under supervision using the single pilot procedures.

3) The minimum required recent experience for a pilot engaged in a single-pilot operation under IFR shall be 5 IFR flights, including 3 instrument approaches, carried out during the preceding 90 days on a helicopter approved in the single-pilot role. This requirement may be replaced by an IFR instrument approach check on the helicopter or an FSTD.

7.2 Flight crew member emergency duties

7.2.1 The operator 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.

7.2.2 Emergency and Safety Equipment training and checking. An operator shall ensure that each flight crew member undergoes initial and recurrent training and checking on the location and use of all emergency and safety equipment carried. The period of validity of an emergency and safety equipment check shall be 12 calendar months in addition to the remainder of the month of issue. If issued within the final 2 calendar months of validity of a previous emergency and safety check, the period of validity shall extend from the date of issue until 12 calendar months from the expiry date of that previous emergency and safety equipment check.

7.3 Flight crew member training programmes

7.3.1 Initial training.

7.3.1.1 An operator shall ensure that each flight crew member successfully complete initial training.

7.3.1.2 An Operator shall establish and maintain an initial ground and flight training programme, approved by the CAAM which ensures that all flight crew members are adequately trained to perform their assigned duties.

7.3.1.3 The training programme shall:

a) include ground and flight training facilities and properly qualified instructors.

b) consist of ground and flight training in the type(s) of aircraft on which the flight crew members serve.

c) include proper flight crew coordination and training in all types of emergency and abnormal situations or procedures caused by power plant, airframe or systems malfunctions, fire or other abnormalities.

d) include training in knowledge and skills related to visual and instrument flight procedures for the intended area of operation, human performance including threat and error management and in the transport of dangerous goods.

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) training be given on a recurrent basis and shall include an assessment of competence.

g) Safety equipment training and checking as described in 7.2.2

7.3.1.4 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 CAAM, of flight simulation training devices approved by the CAAM for that purpose or

b) the completion within the appropriate period of the proficiency check required by the provisions in Paragraphs 7.3.2, 7.3.2.1, 7.3.5.

7.3.2 Initial Operator's Crew Resource Management (CRM) training.

7.3.2.1 The flight crew member shall have completed an initial CRM training course before commencing unsupervised line flying.

7.3.2.2 If the flight crew has not previously received theoretical training in human factors to the ATPL level, he shall complete, before or combined with the initial CRM training, a theoretical course provided by the operator and based on the human performance limitations syllabus for the ATPL.

7.3.2.3 Initial CRM training shall be conducted by at least one CRM trainer acceptable to the CAAM who may be assisted by experts in order to address specific areas, and conducted in accordance with a detailed course syllabus included in the Operations Manual.

Note. – Further guidance on CRM training syllabus can be found in CAGM 6012 – CRM and ICAO Doc 9683.

7.3.3 Conversion Training and checking.

7.3.3.1 An operator shall ensure that:

a) A flight crew member completes a Type Rating course which satisfies the applicable requirements when changing from one type of helicopter to another type for which a new type rating is required.

b) A flight crew member completes an operator's conversion course before commencing unsupervised line flying.

1) When changing to a helicopter for which a new type rating is required; or

2) When changing operator.

c) Conversion training is conducted by suitably qualified persons in accordance with a detailed course syllabus included in the Operations Manual.

d) The amount of training required by the operator's conversion course is determined after due note has been taken of the flight crew member's previous training as recorded in his training records.

e) The minimum standards of qualification and experience required of flight crew members before undertaking conversion training are specified in the Operations Manual.

f) Each flight crew member undergoes the checks required by the provisions in 7.4.3 and the training and checks required by 7.2.2 before commencing line flying under supervision.

g) Once an operator's conversion course has been commenced, a flight crew member does not undertake flying duties on another type or class until the course is completed or terminated, and

h) Elements of CRM training are integrated into the conversion course.

7.3.3.2 In the case of changing helicopter type, the check required by the provisions in Paragraph 7.4.3.1 may be combined with the type or class rating skill test under the requirements applicable to the issue of Flight Crew Licence.

7.3.3.3 The operator's conversion course and the Type Rating course required may be combined.

7.3.4 Differences Training and Familiarisation training.

7.3.4.1 An operator shall ensure that a flight crew member completes:

a) Differences training which requires additional knowledge and training on an appropriate training device or the aircraft. It shall be carried out:

1) When operating a variant of a helicopter currently operated; or

2) When introducing a significant change of equipment and/or procedures on types or variants currently operated.

b) Familiarisation training which requires the acquisition of additional knowledge:

1) When 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.

7.3.4.2 The operator shall specify in the Operations Manual when such differences training or familiarisation training is required.

7.3.5 Recurrent Training and Checking

7.3.5.1 General - An operator shall ensure that:

a) Each flight crew member undergoes recurrent training and checking and that all such training and checking is relevant to the type or variant of helicopter on which the crew member is certificated to operate.

b) A recurrent training and checking programme are established in the Operations Manual and approved by the CAAM.

c) Recurrent training is conducted by the following personnel:

1) Ground and refresher training - by a suitably qualified person.

2) Helicopter/flight simulator training - by a Flight Instructor

3) Emergency and safety equipment training and checking - by suitably qualified personnel; and

4) Crew Resource Management (CRM) training - by suitably qualified personnel.

d) Recurrent checking is conducted by the following personnel:

1) Pilot proficiency checks - by a CAAM Flight Operations Inspector, or a CAAM Designated Flight Examiner trained in CRM concepts and the assessment of CRM skills.

2) Line checks - by suitably qualified instructors nominated by the operator and acceptable to the CAAM

3) Emergency and safety equipment checking – by suitably qualified personnel.

7.3.5.2 Line Check. An operator shall ensure that each flight crew member undergoes a line check on the helicopter to demonstrate his competence in carrying out normal line operations described in the Operations Manual. The line check shall include a demonstration of adequate knowledge of the route or area to be flown and of the aerodromes including alternate aerodromes, facilities and procedures to be used. A line check shall be valid to the end of the month which it is done, 12 calendar months later. If the line check renewal is carried out within the final 2 months of validity, the period of validity shall extend from the date of issue until 12 calendar months after the expiry date of the previous line check.

7.3.5.3 Emergency and Safety Equipment training and checking. An operator shall ensure that each flight crew member undergoes recurrent training and checking on the location and use of all emergency and safety equipment carried.

7.3.5.4 CRM. An operator shall ensure that:

7.3.5.4.1 Elements of CRM are integrated into all appropriate phases of the recurrent training; and

7.3.5.4.2 Each flight crew member undergoes specific modular CRM training. All major topics of the initial CRM training shall be covered over a period not exceeding 3 years.

7.3.5.5 An operator shall ensure that each flight crew member undergoes specific modular CRM refresher training at leave every 12 calendar months. If the CRM training is conducted within 2 calendar months prior to the expiry of the 12 calendar months period, the CRM training must be completed within 12 calendar months of the original expiry date of the previous ground and refresher training.

7.3.5.6 Helicopter/flight simulator training. An operator shall ensure that each flight crew member undergoes helicopter/flight simulator training at least every 12 calendar months. If the training is conducted within 2 calendar months prior to the expiry of the 12 calendar months period, the next helicopter/flight simulator training must be completed within 12 calendar months of the original expiry date of the previous ground and refresher training.

7.3.6 Pilot qualification to operate in either pilot's seat

7.3.6.1 An operator shall ensure that:

a) A pilot who may be assigned to operate in either pilot's seat completes appropriate training and checking; and

b) The training and checking programme are specified in the Operations Manual and is acceptable to the CAAM.

7.4 Qualifications

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

7.4.1.1 An operator shall ensure that:

a) A pilot does not operate a helicopter unless he has carried out at least three take-offs, three circuits and three landings as pilot flying in a helicopter of the same type, or an approved FSTD, of the helicopter type to be used, in the preceding 90 days.

b) A pilot does not does not engage in offshore operation or over hostile environment, unless he has carried out at least three take offs, three circuits and three landings as a pilot flying in a helicopter of the same type to be used, in the preceding 90 days.

c) For night VMC operations:

1) a pilot without a valid instrument rating has carried out at least three take-offs, three circuits and three landings at night in the preceding 90 days. This recency may be obtained in an STD.

2) a pilot with a valid instrument rating satisfies the night recent experience requirement if he has carried out at least three instrument approaches in the preceding 90 days. This recency may be obtained in a STD.

7.4.1.2 The 90 day period prescribed in the provision in Paragraph 7.4.1.1 above may be extended up to a maximum of 120 days by line flying under the supervision of a qualified Instructor or CAAM Designated Flight Examiner. For periods beyond 120 days, the recency requirement is satisfied by a training flight or use of an FSTD or the helicopter type to be used.

7.4.1.3 An operator shall ensure that a flight crew member does not operate on more than one type or variant, unless: the flight crew member is competent to do so.

7.4.1.4 When considering operations of more than one type or variant, an operator shall ensure that the differences and/or similarities of the aeroplanes concerned justify such operations, taking account of the following:

a) The level of technology.

b) Operational procedures.

c) Handling characteristics.

7.4.1.5 An Operator shall ensure that a flight crew member operating more than one type or variant complies with all of the requirements for each type or variant unless the CAAM has approved the use of credit(s) related to the training, checking and recent experience requirements.

7.4.1.6 An operator shall specify appropriate procedures and/or operational restrictions, approved by the CAAM, in the Operations Manual, for any operation on more than one type or variant covering:

a) The flight level crew members' minimum experience level.

b) The minimum experience level on one type or variant before beginning training for and operation of another type or variant.

c) The process whereby flight crew qualified on one type or variant will be trained and qualified on another type or variant; and

d) All applicable recent experience requirements for each type or variant.

7.4.1.7 Where credits are sought to reduce the training and checking and recent experience requirements between aeroplane types, the operator must demonstrate to the CAAM which items need not be repeated on each type or variant because of similarities.

7.4.2 Pilot-in-command operational qualification

7.4.2.1 The operator shall not utilise 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 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 shall maintain a record, sufficient to satisfy CAAM of the qualification of the pilot and of the manner in which such qualification has been achieved.

7.4.2.5 The operator shall not continue to utilise a pilot as a pilot-in-command on an operation in an area specified by the operator and approved by CAAM 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 7.4.2.2 and 7.4.2.3.

7.4.2.6 The period of validity of the route/role/area competence qualification shall be 12 calendar months in addition to the remainder of:

a) The month of qualification; or

b) The month of the latest operation on the route, in the role or area.

7.4.2.7 If renewed within the final 2 calendar months of validity of previous route/role/area competence qualification, the period of validity shall extend from the date of renewal until 12 calendar months from the expiry date of that previous route/role/area competence qualification.

7.4.3 Pilot proficiency checks

7.4.3.1 The operator 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, the 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 CAAM. Such checks shall be performed twice within any period of one year. Any two such checks which are similar and which occur within a period of four consecutive months shall not alone satisfy this requirement.

Note 1 - Flight simulation training devices approved by CAAM may be used for those parts of the checks for which they are specifically approved.

7.4.3.2 Pilot proficiency checks are categorised as Licence Proficiency Checks (LPC) and Operator Proficiency Checks (OPC).

7.4.3.3 The period of validity of a LPC shall be valid in accordance with 2.1.5 of CAD 1 – PEL.

Note. – The period of validity of a LPC stated in 2.1.5 of CAD 1 - PEL, means if the pilot performs a proficiency check on 5th January 2018, the validity will expire by 23:59 hrs of 31 January 2019. While if the applicant performs a Licence Proficiency check within 3 months before the expiry (31 January

2019), the next Licence Proficiency check will expire by 31 January 2020 at 23:59 hrs.

7.4.3.4 Where an Instrument Rating Test (IRT) is required, the proficiency check shall be classified as a LPC.

7.4.3.5 To satisfy the requirements of a bi-annual proficiency check as required by paragraph 7.4.3.1, for the purpose of Commercial Air Transport, an OPC shall be carried out by the operator during the period of validity of the LPC. The OPC shall not be conducted earlier than 4 months after the LPC is conducted, and not later than 4 months before the LPC expiry date.

7.4.3.6 An operator shall ensure that:

a) Each flight crew member undergoes proficiency checks to demonstrate his competence in carrying out normal, abnormal and emergency procedures; and

b) The check is conducted without external visual reference when the flight crew member will be required to operate under IFR.

c) Each flight crew member undergoes proficiency checks as part of a normal flight crew complement.

7.4.3.7 When engine out manoeuvres are carried out in an aircraft, the engine failure must be simulated.

7.4.3.8 Pilot proficiency checks shall be conducted by a CAAM Flight Operations Inspector or a CAAM Designated Flight Examiner.

7.4.3.9 Where applicable, operator proficiency checks shall include the following manoeuvres:

a) engine fire;

b) fuselage fire;

c) emergency operation of under carriage;

d) fuel dumping;

e) engine failure and relight;

f) hydraulic failure;

g) electrical failure;

h) engine failure during take-off before decision point;

i) engine failure during take-off after decision point;

j) engine failure during landing before decision point;

k) engine failure during landing after decision point;

l) flight and engine control system malfunctions;

m) recovery from unusual attitudes;

n) landing with one or more engine(s) inoperative;

o) instrument meteorological conditions (IMC) autorotation techniques;

p) autorotation to a designated area;

q) pilot incapacitation;

r) directional control failures and malfunctions.

7.4.3.10 For pilots required to engage in IFR operations, proficiency checks include the following additional abnormal/emergency procedures:

a) 3D approach operation to minima;

b) go-around on instruments from minima with, in the case of multi- engined helicopters, a simulated failure of one engine;

c) 2D approach operation to minima;

d) at least one of the 3D or 2D approach operations should be an RNP APCH or RNP AR APCH operation;

e) in the case of multi-engined helicopters, a simulated failure of one engine to be included in either the 3D or 2D approach operation to minima;

f) landing with a simulated failure of one or more engines;

g) where appropriate to the helicopter type, approach with flight control system/flight director system malfunctions, flight instrument and navigation equipment failures.

7.4.3.11 Before a flight crew member, without a valid instrument rating, may operate VMC at night he will be required to undergo a proficiency check at night. Thereafter, each second proficiency check shall then be conducted at night.

7.5 Flight crew equipment (Spare corrective lenses)

7.5.1 For provisions on flight crew equipment, refer to CAD 1004 Para 9.14

7.6 Attestation Certificate

7.6.1 Expiries stated in 2.9.10.1, 7.2.2, 7.3.5.2, and 6.1.2 b) of CAD 19 shall be documented in an attestation certificate. The attestation certificate shall be issued by the operator.

Note. – Sample of Attestation Certificate is contained in CAGM 6009 – CC.

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8 Flight Operations Officer/Flight Dispatcher

8.1 General

8.1.1 The CAAM accepts proof of qualifications and does not require a flight operations officer/flight dispatcher to be licenced. Such persons shall meet the requirements specified in CAD 1 for the Flight Operations Officer/Flight Dispatcher, in accordance with the approved method of control and supervision of flight operations.

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

a) satisfactorily completed the operator-specific training course that addresses all the specific components of its approved method of control and supervision of flight operations specified in 2.2.1.3;

Note - Guidance on the composition of such training syllabi is provided in the Training Manual (ICAO Doc 7192), Part D-3 — Flight Operations Officers/Flight Dispatchers.

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 authorised to exercise flight supervision. The flight shall include landings at as many heliports as practicable;

Note - 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 described in Appendix 8;
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 authorised to exercise flight supervision:

1) the seasonal meteorological conditions and the sources of meteorological information;
2) the effects of meteorological conditions on radio reception in the helicopters used;
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 2.6.

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

Note.- Guidance material to design training programmes to develop knowledge and skills in human performance can be found in the Human Factors Training Manual (ICAO Doc 9683).

8.1.4 A flight operations officer/flight dispatcher shall not be assigned to duty after 12 consecutive months of absence from such duty, unless the provisions of 8.1.2 are met.

9 Manuals, Logs and Records

Note.- The following additional manuals, logs and records are associated with this CAD 6 - Part 3 but are not included in this chapter:

a) Fuel and oil records — see 2.2.9

b) Maintenance records — see 6.4 Applicable as of 5 November 2020, section 6.4 will be titled Continuing Airworthiness Records.

c) Flight time, flight duty periods, duty periods and rest periods records — see 2.8

d) Flight preparation forms — see 2.3

e) Operational flight plan — see 2.3.3

f) Pilot-in-command operational qualification records — see 7.4.2.46.1.1.

9.1 Flight manual

Note - The flight manual contains the information specified in CAD 8.

9.1.1 The flight manual shall be updated by implementing changes made mandatory by the State of Registry.

9.2 Continuing airworthiness management exposition

9.2.1 The continuing airworthiness management exposition provided in accordance with 6.2, which may be issued in separate parts, shall contain the following information:

a) a description of the procedures required by 6.1.1 including, when applicable:

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

b) names and duties of the person or persons required by 6.1.4;

c) a reference to the maintenance programme required by 6.3.1;

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

e) a description of the procedures for monitoring, assessing and reporting maintenance and operational experience required by 6.5.1;

f) a description of the procedures for complying with the service information reporting requirements of CAD 8, Part II, Chapter 4;

g) a description of procedures for assessing continuing airworthiness information and implementing any resulting actions, as required by 6.5.2;

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 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 utilisation 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 organisation responsible for the type design, and any additional applicable experience.

9.4 Journey log book

9.4.1 An operator shall contain the following information for each flight in the form of a Journey Log:

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 A PIC shall ensure that the Journey log is completed

9.4.3 An operator shall ensure that all entries are made concurrently and that they are permanent in nature.

9.4.4 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 equipment carried

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

9.6 Flight recorder records

9.6.1 The operator shall ensure, to the extent possible, in the event the helicopter becomes involved in an accident or incident, the preservation of all related flight recorder records, and if necessary the associated flight recorders, and their retention in safe custody pending their disposition as determined in accordance with CAD 13.

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10 Cabin Crew

10.1 General

10.1.1 In addition to the following paragraphs, the operator shall comply with CAD 6009 – Cabin Crew for all matters related to the duties and responsibilities of a cabin crew member.

Note. – Guidance material can be found in CAGM 6009 – Cabin Crew,

10.2 Assignment of emergency duties

10.2.1 The operator shall establish, to the satisfaction of CAAM, the minimum number of cabin crew required for each type of helicopter, based on seating capacity or the number of passengers carried, which shall not be less than the minimum number established during certification, in order to effect 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.

10.3 Protection of cabin crew during flight

10.3.1 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.

10.4 Training

10.4.1 The operator shall establish and maintain a training programme as per CAD 6009, approved by CAAM, to be completed by all persons before being assigned as a cabin crew member.

Note 1 - Requirements for the training of cabin crew members in the transport of dangerous goods are included in the Dangerous Goods Training Programme contained in CAD 18 - The Safe Transport of Dangerous Goods by Air and the Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Doc 9284).

Note 2 - Guidance material to design training programmes to develop knowledge and skills in human performance can be found in CAGM 6009 – Cabin crew and Cabin Crew Safety Training Manual (ICAO Doc 10002).

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11 Security

In addition to the following paragraphs, the operator shall comply with CAD 17 – Security.

11.1 Helicopter search procedure checklist

11.1.1 The operator 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.

11.1.2 An operator shall ensure the availability of security instructions and guidance of a non-confidential nature which must include the CAAM and responsibilities of operations personnel. Policies and procedures for handling and reporting crime on board such as unlawful interference, sabotage, bomb threats, and hijacking must also be included.

11.2 Training programmes

11.2.1 Pursuant to Regulation 9 of Civil Aviation (Security) Regulation 2019, an operator shall establish and maintain a security training programme for crew members, including theoretical and practical elements. This training shall be provided at the time of operator conversion training and thereafter at intervals not exceeding three years. The content and duration of the training shall be adapted to the security threats of the individual operator and shall ensure that crew members act in the most appropriate manner to minimise the consequences of acts of unlawful interference. This programme shall include the following elements:

a) determination of the seriousness of the occurrence.

b) crew communication and coordination.

c) appropriate self-defence responses.

d) use of non-lethal protective devices assigned to crew members whose use is authorised by the Member State.

e) understanding of behaviour of terrorists so as to facilitate the ability of crew members to cope with hijacker behaviour and passenger responses.

f) in case where cabin crew are required, live situational training exercises regarding various threat conditions.

g) flight crew compartment procedures to protect the aircraft.

h) aircraft search procedures, including identification of prohibited articles; and

i) guidance on the least risk bomb locations.

11.2.1.1 Pursuant to Regulation 9 of Civil Aviation (Security) Regulation 2019, an operator shall establish and maintain a security training programme for ground

personnel to acquaint appropriate employees with preventive measures and techniques in relation to passengers, baggage, cargo, mail, equipment, stores and supplies intended for carriage so that they contribute to the prevention of acts of sabotage or other forms of unlawful interference.

11.3 Reporting acts of unlawful interference

11.3.1 Following an act of unlawful interference on board an aircraft the PIC or, in his absence the operator, shall submit, without delay, a report of such an act to the designated local authority and the CAAM.

11.4 Miscellaneous

11.4.1 Carriage of weapons of war and munitions of war.

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

11.4.1.2 An operator shall ensure that weapons of war and munitions of war are:

a) Stowed in the aircraft in a place which is inaccessible to passengers during flight; and

b) In the case of firearms, unloaded.

11.4.1.3 An operator shall ensure that the PIC is notified before a flight begins of the details and location on board the aircraft of any weapons of war and munitions of war intended to be carried.

CAD 6 - PART 3

HELICOPTER

SECTION III

GENERAL AVIATION

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1 General

1.1 Compliance with laws, regulations and procedures

1.1.1 The pilot-in-command shall comply with the relevant laws, regulations and procedures of the States in which the helicopter is operated.

Note 1 - Compliance with more restrictive measures, not in contravention of the provisions of 1.1.1, may be required by the State of Registry.

Note 2 - Rules covering flight over the high seas are contained in CAD 2.

Note 3 - Information for pilots on flight procedure parameters and operational procedures is contained in PANS-OPS (ICAO Doc 8168), Volume I. Criteria for the construction of visual and instrument flight procedures are contained in PANS-OPS (ICAO Doc 8168), Volume II. Obstacle Clearance criteria and procedures used in certain States may differ from PANS-OPS, and knowledge of these differences is important for safety reasons.

1.1.2 The pilot-in-command shall have responsibility for operational control

1.1.3 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.

1.1.4 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 Registry. Such reports shall be submitted as soon as possible and normally within ten days.

1.1.4.1 In the event that the pilot-in-command is incapable of providing such notification, this task shall be undertaken by any other member of the crew if they are able to do so.

1.1.5 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 CAD 13.

1.1.6 The pilot-in-command shall have available on board the helicopter essential information concerning the search and rescue services in the areas over which it is intended the helicopter will be flown.

1.1.7 All crew members shall be familiar with the laws, regulations and procedures pertinent to the performance of their duties.

1.1.8 The pilot-in-command shall ensure that flight crew members demonstrate the ability to speak and understand the language used for aeronautical radiotelephony communications.

1.2 Dangerous goods

Note 1 - Provisions for carriage of dangerous goods are contained in CAD 18.

Note 2 - Article 35 of the Convention refers to certain classes of cargo restrictions.

1.2.1 The pilot-in-command shall take all reasonable measures to prevent dangerous goods from being carried on board inadvertently.

1.2.2 The pilot-in-command shall, in accordance with the Technical Instructions, report without delay to the competent authority and the appropriate authority of the State of occurrence in the event of any dangerous goods accidents or incidents.

1.2.3 The pilot-in-command shall ensure that passengers are provided with information about dangerous goods in accordance with the Technical Instructions.

1.2.4 Reasonable quantities of articles and substances that would otherwise be classified as dangerous goods and that are used to facilitate flight safety, where carriage aboard the aircraft is advisable to ensure their timely availability for operational purposes, shall be considered authorised under paragraph 1;2.2.1(a) of the Technical Instructions. This is regardless of whether or not such articles and substances are required to be carried or intended to be used in connection with a particular flight.

1.2.5 The packing and loading on board of the above-mentioned articles and substances shall be performed, under the responsibility of the pilot-in-command, in such a way as to minimise the risks posed to crew members, passengers, cargo or the aircraft during aircraft operations.

1.3 Use of psychoactive substances

1.3.1 No person whose function is critical to the safety of aviation (safety-sensitive personnel) shall undertake that function while under the influence of any psychoactive substance, by reason of which human performance is impaired. No such person shall engage in any kind of problematic use of substances. Provisions concerning the use of psychoactive substances are also contained in CAD 1 - 1.2.7 and CAD 2, 2.5.

1.4 Specific approvals

1.4.1 The pilot-in-command shall not conduct operations for which a specific approval is required unless such approval has been issued by the CAAM. Specific

approvals shall follow the layout and contain at least the information listed in Appendix 5.

1.4.2 Operations which require a specific approval are:

a) Night Vision Imaging System (NVIS);

b) Helicopter Offshore Operations (HOFO)

c) Electronic Flight Bags (EFBs);

d) Performance Based Navigation (PBN);

e) Low Visibility Operations (LVO).

1.5 Operational certification and supervision

1.5.1 The pilot-in-command / operator shall not engage in general aviation operations unless in possession of a valid Certificate of Approval issued by the CAAM.

1.5.2 The Certificate of Approval authorises the pilot-in-command / operator to carry out non-commercial operations in accordance with the standard and special provisions contained therein.

1.5.3 The holder of the Certificate of Approval shall be responsible for the strict observance of the terms and provisions contained therein.

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2 Flight Operations

2.1 Adequacy of operating facilities

2.1.1 The pilot-in-command shall not commence a flight unless it has been ascertained by every reasonable means available that the ground and/or water facilities available and directly required for such flight and for the safe operation of the helicopter are adequate including communication facilities and navigation aids.

Note.— "Reasonable means" in this Standard is intended to denote the use, at the point of departure, of information available to the pilot-in-command either through official information published by the aeronautical information services or readily obtainable from other sources.

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

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

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

2.2 Heliport or landing location operating minima

2.2.1 The pilot-in-command shall establish operating minima in accordance with criteria specified by the State of Registry for each heliport or landing location to be used in operations. Such minima shall not be lower than any that may be established by the State of the Aerodrome, except when specifically approved by that State.

Note.- This Standard does not require the State of the Aerodrome to establish operating minima.

2.2.1.1 The State of Registry may approve operational credit(s) for operations with helicopters equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS. Such approvals shall not affect the classification of the instrument approach procedure.

Note 1.- Operational credit includes:

a) for the purposes of an approach ban (2.6.3.2), 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.

Note 2.- Guidance on operational credit for aircraft equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS and CVS is contained in Attachment G and in the Manual of All-Weather Operations (ICAO Doc 9365).

Note 3.- Information regarding a HUD or equivalent displays, including references to RTCA and EUROCAE documents, is contained in the Manual of All-Weather Operations (ICAO Doc 9365).

Note 4.- 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.

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

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

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

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

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

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

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

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

Note 3.— 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 (ICAO Doc 9365) and CAGM 6008 (III) – Low Visibility Operations.

2.2.1.3 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.

2.2.1.4 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.

2.2.1.5 When establishing an aerodrome operating minima, the pilot-in-command shall take the following into account:

a) the type, performance and handling characteristics of the aircraft;

b) his/her competence and experience;

c) the dimensions and characteristics of the runways and final approach and take-off areas (FATOs) that may be selected for use;

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

e) the equipment available in the aircraft for the purpose of navigation and/or control of the flight path, during the take-off, the approach, the flare, the landing, the rollout and the missed approach;

f) the obstacles in the approach, the missed approach and the climb-out areas necessary for the execution of contingency procedures;

g) the obstacle clearance altitude/height for the instrument approach procedures;

h) the means to determine and report meteorological conditions; and

i) the flight technique to be used during the final approach.

2.2.1.6 The minima for a specific type of approach and landing procedure shall only be used if all the following conditions are met:

a) the ground equipment required for the intended procedure is operative;

b) the aircraft systems required for the type of approach are operative’

c) the required aircraft performance criteria are met; and

d) the pilot is qualified appropriately.

2.3 Briefing

2.3.1 The pilot-in-command shall ensure that crew members and passengers are made familiar, by means of an oral briefing or by other means, with the location and the use of:

a) seat belts or harnesses; and, as appropriate,

b) emergency exits;

c) life jackets;

d) oxygen dispensing equipment; and

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

2.3.2 The pilot-in-command shall ensure that all persons on board are aware of the location and general manner of use of the principal emergency equipment carried for collective use.

2.3.3 In an emergency during flight, the pilot-in-command shall ensure that passengers are instructed in such emergency action as may be appropriate to the circumstances.

2.3.4 The pilot-in-command 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 an aircrafts shall be secured in their seats by means of the seat belts or harnesses provided.

2.4 Helicopter airworthiness and safety precautions

2.4.1 A flight shall not be commenced until the pilot-in-command is satisfied that:

a) the helicopter is airworthy, duly registered and that appropriate certificates with respect thereto are aboard the helicopter;

b) the instruments and equipment installed in the helicopter are appropriate, taking into account the expected flight conditions;

c) any necessary maintenance has been performed in accordance with Chapter 6 of section II;

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; and

f) the helicopter operating limitations contained in the flight manual, or its equivalent, will not be exceeded.

2.5 Weather reports and forecasts

2.5.1 Before commencing a flight, the pilot-in-command shall be familiar with all available meteorological information appropriate to the intended flight. Preparation for a flight away from the vicinity of the place of departure, and for every flight under IFR, shall include: 1) a study of available current weather reports and forecasts; and 2) the planning of an alternative course of action to provide for the eventuality that the flight cannot be completed as planned, because of weather conditions.

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

2.6 Limitations imposed by weather conditions

2.6.1 Flight in accordance with VFR

2.6.1.1 A flight, except one of purely local character in visual meteorological conditions, 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 under VFR, will, at the appropriate time, be such as to enable compliance with these rules.

2.6.2 Flight in accordance with IFR

2.6.2.1 When an alternate is required, a flight to be conducted in accordance with IFR shall not be commenced unless the available current meteorological information indicates that the following meteorological conditions will exist from 2 hours before to 2 hours after the estimated time of arrival, or from the actual time of departure to 2 hours after the estimated time of arrival, whichever is the shorter period:

a) a cloud base of at least 120 m (400 ft) above the minimum associated with the instrument approach procedure; and

b) visibility of at least 1 500 m more than the minimum associated with the procedure; or

2.6.2.2 When the place of intended landing is isolated and no alternate is required:

a) an instrument approach procedure is prescribed for the aerodrome of intended landing;

b) available current meteorological information indicates that the following meteorological conditions will exist from 2 hours before to 2 hours after the estimated time of arrival:

1) the cloud base is at least 120 m (400 ft) above the minimum associated with the instrument approach procedure;

2) visibility is at least 1 500 m more than the minimum associated with the procedure

Note - These should be considered as minimum values where a reliable and continuous meteorological watch is maintained. When only an "area" type forecast is available these values should be increased accordingly.

2.6.3 Heliport operating minima

2.6.3.1 A flight shall not be continued towards the heliport of intended landing unless the latest available meteorological information indicates that conditions at that heliport, or at least one alternate heliport, will, at the estimated time of arrival, be at or above the specified heliport operating minima.

2.6.3.2 An instrument approach shall not be continued below 300m (1000ft) 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 (ICAO Doc 8168), Volume II.

2.6.3.3 If, after entering the final approach segment or after descending below 300m (1000ft) 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 beyond a point at which the limits of the heliport operating minima would be infringed.

2.6.4 Flight in icing conditions

2.6.5 Ice and other contaminants – ground and flight procedures

a) The pilot-in-command shall only commence take-off if the aircraft is clear of any deposit that might adversely affect the performance or controllability of the aircraft, except as permitted in the AFM.

b) 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.

c) A flight to be planned or expected to operate in suspected or known ground icing conditions shall not take off 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.

2.7 Alternate heliports

2.7.1 For a flight to be conducted in accordance with IFR, at least one alternate heliport or landing location shall be specified in the operational flight plan, unless:

a) the weather conditions in 2.6.2.2 prevail

b)

1) the heliport or landing location of intended landing is isolated and no alternate heliport or landing location is available; and
2) an instrument approach procedure is prescribed for the isolated heliport of intended landing; and

3) a point of no return (PNR) is determined in case of an offshore destination.

2.7.2 Suitable offshore alternates may be specified subject to the following:

a) the offshore alternates shall be used only after passing 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 alternate;

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; and

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.

2.7.3 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.

2.8 Fuel and oil requirements

2.8.1 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.

2.8.2 VFR operations. The fuel and oil carried in order to comply with 2.8.1 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 a 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 potential contingencies, as determined by CAAM.

2.8.3 IFR operations. The fuel and oil carried in order to comply with 2.8.1 shall, in the case of IFR operations, be at least the amount to allow the helicopter:

2.8.3.1 When no alternate is required, in terms of 2.6.2.2, to fly to and execute an approach at the heliport or landing location to which the flight is planned, and thereafter to have:

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

b) an additional amount of fuel to provide for the increased consumption on the occurrence of potential contingencies.

2.8.3.2 When an alternate is required, in terms of 2.6.2.1, 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:

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

b) have a final reserve fuel to fly for 30 minutes at holding speed at 450m (1500ft) above the alternate under standard temperature conditions, and approach and land; and

c) have an additional amount of fuel to provide for the increased consumption on the occurrence of potential contingencies.

2.8.3.3 When no alternate heliport or landing location is available (i.e. the heliport of intended landing is isolated and no alternate is available), to fly to the heliport to which the flight is planned and thereafter for a period as specified by CAAM.

2.8.4 In computing the fuel and oil required in 2.8.1, 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 for loss of pressurisation, 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.

Note - Nothing in 2.8 precludes amendment of a flight plan in flight in order to re-plan the flight to another heliport, provided that the requirements of 2.8 can be complied with from the point where the flight has been re-planned.

2.8.5 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.

2.9 In-flight fuel management

2.9.1 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.

Note - The protection of final reserve fuel is intended to ensure safe landing at any heliport or landing location when unforeseen occurrences may not permit a safe completion of an operation as originally planned.

2.9.2 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.

2.9.3 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 2.8.

Note 1.- The planned final reserve fuel refers to the value calculated in 2.8 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 CAD 10, Volume II, 5.3.2.1.1, b) 3).

2.9.4 The pilot-in-command shall check at regular intervals that the amount of usable fuel remaining in flight is not less than the fuel required to proceed to a weather-permissible aerodrome or operating site and the planned reserve fuel as required by 2.8.2 and 2.8.3.

2.10 Oxygen supply

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

Absolute pressure	*Metres*	*Feet*
700hPa	*3000*	*10000*
620hPa	*4000*	*13000*

2.10.1 A flight to be operated at altitudes at which the pressure altitude in personnel compartments will be more than 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 altitude in compartments occupied by them will be between 10 000 ft and 13 000 ft;

b) the crew and passengers for any period that the pressure altitude in compartments occupied by them will be more than 13 000 ft.

2.10.2 A flight to be operated with a pressurised helicopter shall not be commenced unless a sufficient quantity of stored breathing oxygen is carried to supply all the crew members and a proportion of the passengers, as is appropriate to the circumstances of the flight being undertaken, in the event of loss of pressurisation, for any period that the pressure altitude in any compartment occupied by them would be more than 10 000 ft.

2.11 Use of oxygen

2.11.1 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 2.10.1 or 2.10.2.

2.11.2 Pressurised helicopters in the event of loss of pressurisation

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

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

2.12 In-flight emergency instruction

2.12.1 In an emergency during flight, the pilot-in-command shall ensure that all persons on board are instructed in such emergency action as may be appropriate to the circumstances.

2.13 Weather reporting by pilots

2.13.1 When weather conditions likely to affect the safety of other aircraft are encountered, they shall be reported as soon as possible.

2.14 Hazardous flight conditions

2.14.1 Hazardous flight conditions, other than those associated with meteorological conditions, encountered en route should be reported as soon as possible. The reports so rendered shall give such details as may be pertinent to the safety of other aircraft.

2.15 Fitness of flight crew members

2.15.1 The pilot-in-command shall be responsible for ensuring that a flight:

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

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

2.16 Flight crew members at duty stations

2.16.1 Take-off and landing

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

2.16.2 En-route

2.16.2.1 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, provided at least one suitably qualified pilot remains at the controls of the helicopter at all times

2.16.3 Seat belts

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

2.16.4 Safety harness

2.16.4.1 When safety harnesses are provided, any flight crew member occupying a pilot's seat shall keep the safety harness fastened during the taxi, take-off and landing phases; all other flight crew members shall keep their safety harness fastened during the taxi, 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 strap(s) and a seat belt which may be used independently.

2.17 Instrument flight procedures

2.17.1 One or more instrument approach procedures designed to support instrument approach operations shall be approved and promulgated by 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, to serve each final approach and take-off area or heliport utilised for instrument flight operations.

2.17.2 All 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.- See Section II, Chapter 2, 2.2.1.2, for instrument approach operation classifications.

Note 2.- Information for pilots on flight procedure parameters and operational procedures is contained in PANS-OPS (ICAO Doc 8168), Volume I. Criteria for the construction of instrument flight procedures for the guidance of procedure specialists are provided in PANS-OPS (ICAO Doc 8168), Volume II. Obstacle clearance criteria and procedures used in certain States may differ from PANS-OPS, and knowledge of these differences is important for safety reasons (see Section II, Chapter 1, 1.1.1).

2.18 Instruction - General

2.18.1 A helicopter rotor shall not be turned under power for the purpose of flight without a qualified pilot at the controls.

2.19 Refuelling with passengers on board or rotors turning

2.19.1 A helicopter shall not be refuelled when passengers are embarking, on board or disembarking or when the rotor is turning unless it is attended by the pilot-in-command or other qualified personnel ready to initiate and direct an evacuation of the helicopter by the most practical and expeditious means available.

2.19.2 When refuelling with passengers embarking, on board or disembarking, two-way communications shall be maintained by helicopter inter-communications system or other suitable means between the ground crew supervising the refuelling and the pilot-in-command or other qualified personnel required by 2.19.1.

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

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

2.20 Over-water flights

2.20.1 All helicopters on flights over water in a hostile environment in accordance with 4.3.1shall be certificated for ditching. Sea state shall be an integral part of ditching information.

2.21 Additional requirements for low visibility operations (LVO)

2.21.1 Requirements for the specific approval for low visibility operations (LVO) are identical to those required in Section II, 2.9.

2.22 Helicopter Offshore Operations (HOFO)

2.22.1 Requirements for Helicopter Offshore Operations (HOFO) can be found in Section II, 2.12.

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3 Helicopter Performance Operating Limitations

3.1 General

3.1.1 A helicopter shall be operated:

a) in compliance with the terms of its airworthiness certificate or equivalent approved document;

b) within the operating limitations prescribed by the certificating authority of the State of Registry; and

c) within the mass limitations imposed by compliance with the applicable noise certification Standards in CAD 16, Volume I, unless otherwise authorised, in exceptional circumstances for a certain heliport where there is no noise disturbance problem, by the competent authority of the State in which the heliport is situated.

3.1.2 Placards, listings, instrument markings, or combinations thereof, containing those operating limitations prescribed by the certificating authority of the State of Registry for visual presentation, shall be displayed in the helicopter.

Note.- The Standards of CAD 8, Part IV, apply to all helicopters intended for the carriage of passengers or cargo or mail in international air navigation.

3.1.3 Where helicopters are operating to or from heliports in a congested hostile environment, the competent authority of the State in which the heliport is situated shall take such precautions as are necessary to control the risk associated with an engine failure.

Note.- Guidance is provided in the Helivopter Code of Performance Development Manual (Doc 10110)

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4 Helicopter Instruments, Equipment and Flight Documents

Note.- Specifications for the provision of helicopter communication and navigation equipment are contained in Chapter 5.

4.1 All helicopters on all flights

4.1.1 General

4.1.1.1 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 State of Registry.

4.1.2 Instruments

4.1.2.1 A helicopter shall be equipped with instruments which will enable the flight crew to control the flight path of the helicopter, carry out any required procedural manoeuvre, and observe the operating limitations of the helicopter in the expected operating conditions.

4.1.3 Equipment

4.1.3.1 A helicopter shall be equipped with or carry on board:

a) an accessible first-aid kit;

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.- Refer to 4.1.3.2 for fire extinguishing agents.

c)

1) a seat or berth for each person on board who is aged 24 months or more, or a station for each crew member or task specialist on board;

2) a seat belt on each passenger seat and restraining belts for each berth, and restraint devices for each station;

3) for helicopters first issued with an individual CofA after 31 December 2012, a seat belt with an upper torso restraint system for each passenger who is aged 24 months or more;

4) a child restraint device (CRD) for each person on board younger than 24 months; and

5) a seat belt with upper torso restraint system incorporating a device that will automatically restrain the occupant's torso in the event of rapid deceleration on each flight crew seat.

6) All helicopters on all flights should be equipped with a safety harness for each flight crew member seat.

Note. – A seat belt with upper torso restraint system shall have a single point release.

Note 2. – Safety harness includes shoulder strap(s) and a seat belt which may be used independently.

d) the following manuals, chart and information:

1) the flight manual or other documents or information concerning any operating limitations prescribed for the helicopter by the certificating authority of the State of Registry, required for the application of Chapter 3;

2) any specific approval issued by the State of Registry, if applicable, for the operation(s) to be conducted;

3) current and suitable charts for the route of the proposed flight and all routes along which it is reasonable to expect that the flight may be diverted;

4) procedures, as prescribed in CAD 2, for pilots-in-command of intercepted aircraft;

5) a list of visual signals for use by intercepting and intercepted aircraft, as contained in CAD 2;

6) the journey log book for the helicopter; and

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

4.1.3.2 Any agent used in a built-in fire extinguisher for each lavatory disposal receptacle for towels, paper or waste in a helicopter for which the individual certificate of airworthiness is first issued on or after 31 December 2011 and any extinguishing agent used in a portable fire extinguisher in a helicopter for which the individual certificate of airworthiness is first issued on or after 31 December 2018 shall:

a) meet the applicable minimum performance requirements of the State of Registry; and

b) not be of a type listed in the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer as it appears in the Eighth Edition of the

Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer, Annex A, Group II.

Note. – Information concerning extinguishing agents is contained in the UNEP Halons Technical Options Committee Technical Note No. 1 - New Technology Halon Alternatives and FAA Report No. DOT/FAA/AR-99-63, Options to the Use of Halons for Aircraft Fire Suppression Systems.

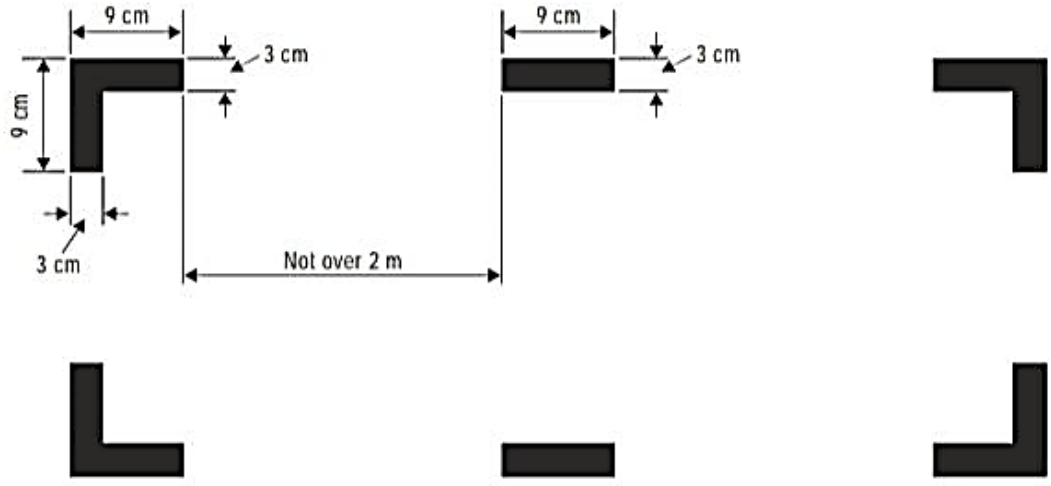
4.1.4 Marking of break-in points

4.1.4.1 If the CAAM requires a helicopter to be marked with break-in points, the operator shall ensure that, if areas of the fuselage suitable for break-in by rescue crews in emergency are marked on a helicopter, such areas shall be marked as shown below (see figure following).

4.1.4.2 In addition to Regulation 96 (1) of the MCAR 2016, the colour of the markings shall be red or yellow and if necessary, they shall be outlined in white to contrast with the background.

4.1.4.3 If the corner markings are more than 2 metres apparat, intermediate lines 9 cm x 3 cm shall be inserted so that there is no more than 2 metres between adjacent marks.

Note - This Standard does not require any helicopter to have break-in areas.



MARKING OF BREAK-IN POINTS (see 4.1.4)

4.1.5 Documents to be carried

4.1.5.1 An aircraft shall carry a certified true copy of the Certificate of Approval and relevant operational specifications to the aircraft type, issued in conjunction with the certificate. When the certificate and the associated operations specifications are issued by other States in a language other than English, an English translation shall be included.

4.1.5.2 An operator shall ensure that the following are carried on each flight:

a) The Certificate of Registration.

b) The Certificate of Airworthiness.

c) The original or a copy of the Noise Certificate (if applicable), including an English translation, where one has been provided by the CAAM.

d) The original or a certified true copy of the Air Operator Certificate and a copy of Operations Specification relevant to the aircraft type, issued in conjunction with the certificate.

e) The Aircraft Radio Station Licence.

f) The original or a copy of the Insurance Certificate(s), which cover the aircraft, its crew, passengers and third-party liability clauses.

4.1.5.3 The AOC and the associated operations specifications issued to an air operator are also intended to provide a basis for another State to authorise operations in its territory by that air operator, provided that the requirements under which the certificate was issued were at least equal to the applicable Standards specified in this CAD.

4.1.5.4 Aircraft engaged in commercial operations are required by this CAD to carry a certified true copy of the AOC and a copy of the associated operations specifications relevant to the aircraft type.

4.1.5.5 The operations specifications associated with an AOC are an integral part of the authorisation under which an operator conducts operations.

4.1.5.6 The specifications identify the CAAM, the number of the associated AOC, the name of the operator, the date of issuance and the signature of the CAAM official responsible for its issuance and show the make, model and series, or master series, of the aircraft, the type of operation and the geographical areas in which operations are authorised.

4.1.5.7 The specifications cover all aspects of the operation and include special limitations and authorisations with criteria as appropriate.

4.1.5.8 There are several ways to certify a copy of the AOC. In any case, the certification statement shall attest that the copy is a true copy of the original, and shall be signed and display an official stamp or seal.

4.1.5.9 The certification statement shall be permanently affixed to the copy, either by placing it on the first page of the document itself or on each page of the document, or by attaching it to the entirety of it.

4.1.5.10 Additional Documents to be Carried.

4.1.5.10.1 An operator shall ensure that, in addition to the documents and manuals prescribed in 4.1.5.2, the following information and forms, relevant to the type and area of operation, are carried on each flight:

a) The current parts of the Operations Manual relevant to the duties of the crew are carried on each flight.

b) Those parts of the Operations Manual which are required for the conduct of a flight are easily accessible to the crew on board the aircraft.

c) The current Aircraft Flight Manual is carried in the aircraft unless the CAAM has accepted that the Operations Manual contains relevant information for that aircraft.

d) Operational Flight Plan containing at least the information required in 2.3.3.3 Operational flight plan.

e) Operator's journey log system.

f) Details of the filed ATS flight plan.

g) Appropriate NOTAM/AIP/AIRAC/AIC/AIS briefing documentation.

h) Appropriate meteorological information.

i) Mass and balance documentation.

j) Notification of special categories of passenger such as security personnel, if not considered as crew, persons with disability, inadmissible passengers, deportees and persons in custody.

k) Notification of special loads including dangerous goods including written information to the pilot-in-command.

l) Current maps, charts and associated documents or equivalent data are available to cover the intended operation of the aircraft including any diversion which may reasonably be expected. This shall include any conversion tables necessary to support operations where metric heights, altitudes and flight levels must be used.

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

n) Forms to comply with the reporting requirements of the CAAM and the operator.

4.1.5.10.2 The CAAM may permit the information detailed in the provision in 4.1.5.10.1 above, or parts thereof, to be presented in a form other than on printed paper. An acceptable standard of accessibility, usability and reliability must be assured.

4.1.6 Minimum Equipment List (MEL).

4.1.6.1 The operator shall include in the OM a MEL, approved by the CAAM 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.

4.1.6.2 The operator shall ensure that the MEL does not affect the aircraft's compliance with the airworthiness requirements as applicable.

4.1.6.3 The MEL shall take into account the aircraft types and variants operated and the type(s)/area(s) of operation.

4.1.6.4 The MEL must include the navigational equipment and take into account the required navigation performance for the route and area of operation.

4.1.6.5 An operator shall not operate an aircraft other than in accordance with the MEL unless permitted by the CAAM. Any such permission will in no circumstances permit operation outside the constraints of the Master Minimum Equipment List (MMEL).

4.1.6.6 Non-Malaysian aircrafts shall ensure that the MEL does not affect the aircraft's compliance with the airworthiness requirements applicable in the State of Registry.

Note.— Guidance on the minimum equipment list is contained in Attachment C of this CAD.

4.1.7 Aircraft Operating Manual (AFM).

4.1.7.1 The operator shall provide operations staff and flight crew with an AFM, 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.

4.1.8 Operations Manual (OM).

4.1.8.1 The operations manual is the means by which the applicant intends to control all aspects of the intended operation.

4.2 Instruments and equipment for flights operated under VFR and IFR - by day and night

Note.- The flight instrument requirements in 4.2.1, 4.2.2 and 4.2.3 may be met by combinations of instruments or by electronic displays.

4.2.1 All helicopters when operating in accordance with VFR by day shall be:

a) equipped with:

1) a magnetic compass;

2) a sensitive pressure altimeter;
3) an airspeed indicator;
4) such additional instruments or equipment as may be prescribed by the appropriate authority; and

b) equipped with, or shall carry, a means of measuring and displaying the time in hours, minutes and seconds.

4.2.2 All helicopters when operating in accordance with VFR at night shall be equipped with:

a) the equipment specified in 4.2.1;

b) an attitude indicator (artificial horizon) for each required pilot;

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 appropriate authority; and the following lights:

g) the lights required by CAD 2 for aircraft in flight or operating on the movement area of a heliport;

Note - The general characteristics of the lights are specified in CAD 8.

h) a landing light;

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

j) lights in all passenger compartments; and

k) a flashlight for each crew member station.

4.2.2.1 The landing light should be trainable, at least in the vertical plane.

4.2.3 All helicopters, when operating in accordance with IFR or at night, or when the helicopter cannot be maintained in a desired attitude without reference to one or more flight instruments, shall be:

a) equipped with:

1) a magnetic compass;
2) a sensitive pressure altimeter;

Note.- Due to the long history of miss-readings, the use of drum-pointer altimeters is not recommended.

3) an airspeed indicating system with a means of preventing malfunctioning due to either condensation or icing;
4) a slip indicator;

5) an attitude indicator (artificial horizon) for each required pilot and one additional attitude indicator;
6) a heading indicator (directional gyroscope);
7) a means of indicating whether the supply of power to the gyroscopic instruments is adequate;
8) a means of indicating on the flight deck the outside air temperature;
9) a rate of climb and descent indicator;
10) such additional instruments or equipment as may be prescribed by the appropriate authority;
11) if operated by night, the lights specified in 4.2.2 g) to k) and 4.2.2.1; and

b) equipped with, or shall carry, a means of measuring and displaying the time in hours, minutes and seconds.

4.3 All helicopters on flights over water

4.3.1 All 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 over-water operations as prescribed by the CAAM; or

b) flying at a distance from land of more than 10 minutes flying time at normal cruising speed.

Note.- When operating in a hostile environment, a safe ditching requires a helicopter to be designed for landing on water or certificated in accordance with ditching provisions.

4.3.2 Emergency equipment

4.3.2.1 Helicopters operating in accordance with the provisions of 4.3.1 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 of the person for whose use it is provided;

b) when not precluded by consideration related to the type of helicopter used, 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; and

c) equipment for making the pyrotechnical distress signals described in CAD 2.

4.3.2.2 When taking off or landing at a heliport where, in, 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, at least the equipment required in 4.3.2.1 a) shall be carried.

4.3.2.3 Each life jacket and equivalent individual flotation device, when carried in accordance with this 4.3, shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons.

4.3.2.4 On any helicopter for which the individual certificate of airworthiness is first issued on or after 1 January 1991, at least 50 per cent of the life rafts carried in accordance with the provisions of 4.3.2 should be deployable by remote control.

4.3.2.5 Rafts which are not deployable by remote control and which have a mass of more than 40kg should be equipped with some means of mechanically assisted deployment.

4.4 All helicopters on flights over designated land areas

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

4.5 All helicopters on high altitude flights

4.5.1 Unpressurised helicopters

4.5.1.1 Unpressurised helicopters intended to be operated at high altitudes shall carry equipment for storing and dispensing the oxygen supplies required in 2.10.1.

4.5.2 Pressurised helicopters

4.5.2.1 Pressurised helicopters intended to be operated at high altitudes shall carry emergency oxygen storage and dispensing equipment capable of storing and dispensing the oxygen supplies required in 2.10.2.

4.6 All helicopters required to comply with the noise certification standards in CAD 16, Volume I

4.6.1 All helicopters required to comply with the noise certification Standards of CAD 16, Volume I, shall carry a document attesting noise certification. When the document, or a suitable statement attesting noise certification as contained in another document approved by the State of Registry, is issued in a language other than English, it shall include an English translation.

Note 1.- The attestation may be contained in any document, carried on board, approved by the State of Registry in accordance with the relevant provisions of CAD 16, Volume I.

Note 2.- The various noise certification Standards of CAD 16, Volume I, which are applicable to helicopters are determined according to the date of application for a

type certificate, or the date of acceptance of an application under an equivalent prescribed procedure by the certificating authority. Some helicopters are not required to comply with any noise certification Standard. For details see CAD 16, Volume I, Part II, Chapters 8 and 11.

4.7 Flight recorders

Note 1.- Crash-protected flight recorders comprise one or more of the following systems:

- *a flight data recorder (FDR),*
- *a cockpit voice recorder (CVR),*
- *an airborne image recorder (AIR),*
- *a data link recorder (DLR).*

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 in this CAD 6 Part 3.

Note 3.- Detailed requirements on flight recorders are contained in Appendix 4.

Note 4.- Lightweight flight recorders comprise one or more of the following systems:

- *an aircraft data recording system (ADRS),*
- *a cockpit audio recording system (CARS),*
- *an airborne image recording system (AIRS),*
- *a data link recording system (DLRS).*

Image and data link information may be recorded on either the CARS or the ADRS.

Note 5.- For helicopters for which the application for type certification is submitted to a Contracting State before 1 January 2016, specifications applicable to crash-protected flight recorders may be found in EUROCAE ED-112, ED-56A, ED-55, Minimum Operational Performance Specifications (MOPS), or earlier equivalent documents.

Note 6.- For helicopters for which the application for type certification is submitted to a Contracting State on or after 1 January 2016, specifications applicable to crash-protected flight recorders may be found in EUROCAE ED-112A, Minimum Operational Performance Specification (MOPS), or equivalent documents.

Note 7.- Specifications applicable to lightweight flight recorders may be found in EUROCAE ED -155, Minimum Operational Performance Specification (MOPS), or equivalent documents.

4.7.1 Flight data recorders and aircraft data recording systems

Note.- Parameters to be recorded are listed in Table A4-1 of Appendix 4.

4.7.1.1 Applicability

4.7.1.1.1 All helicopters of a maximum certificated take-off mass of over 3175kg 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 A4-1 of Appendix 4.

4.7.1.1.2 All helicopters of a maximum certificated take-off mass of over 7000kg, 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 A4-1 of Appendix 4.

4.7.1.1.3 All helicopters of a maximum certificated take-off mass of over 3175kg, up to and including 7000kg, for which the individual certificate of airworthiness is first issued on or after 1 January 1989, should be equipped with an FDR which should record at least the first 15 parameters listed in Table A4-1 of Appendix 4.

4.7.1.2 Recording technology

4.7.1.2.1 FDRs shall not use engraving metal foil, frequency modulation (FM), photographic film or magnetic tape.

4.7.1.3 Duration

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

4.7.2 Cockpit voice recorders and cockpit audio recording systems

4.7.2.1 Applicability

4.7.2.1.1 All helicopters of a maximum certificated take-off mass of over 7000kg shall be equipped with a CVR. For helicopters not equipped with an FDR, at least main rotor speed shall be recorded on the CVR.

4.7.2.1.2 All helicopters of a maximum certificated take-off mass of over 3175kg for which the individual certificate of airworthiness is first issued on or after 1 January 1987 should be equipped with a CVR. For helicopters not equipped with an FDR, at least main rotor speed should be recorded on the CVR.

4.7.2.2 Recording technology

4.7.2.2.1 CVRs shall not use magnetic tape or wire.

4.7.2.3 Duration

4.7.2.3.1 All helicopters required to be equipped with a CVR shall be equipped with a CVR which shall retain the information recorded during at least the last two hours of its operation.

4.7.3 Data link recorders

4.7.3.1 Applicability

4.7.3.1.1 All helicopters for which the individual certificate of airworthiness is first issued on or after 1 January 2016, which utilise any of the data link communications applications listed in 5.1.2 of Appendix 4 and are required to carry a CVR, shall record on a crash-protected flight recorder the data link communications messages.

4.7.3.1.2 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 use any of the data link communications applications referred to in 5.1.2 of Appendix 4, shall record the data link communications messages on a crash-protected flight recorder unless the 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 G-4 in Attachment G 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).

4.7.3.1.3 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 use any of the data link communications applications referred to in 5.1.2 of Appendix 4, should record the data link communications messages on a crash-protected flight recorder.

4.7.3.2 Duration

4.7.3.2.1 The minimum recording duration shall be equal to the duration of the CVR.

4.7.3.3 Correlation

4.7.3.3.1 Data link recording shall be able to be correlated to the recorded cockpit audio.

4.7.4 Flight recorders - general

4.7.4.1 Construction and installation

4.7.4.1.1 Flight recorders shall be constructed, located and installed so as to provide maximum practical protection for the recordings in order that the recorded information may be preserved, recovered and transcribed. Flight recorders shall meet the prescribed crashworthiness and fire protection specifications.

4.7.4.2 Operation

4.7.4.2.1 Flight recorders shall not be switched off during flight time.

4.7.4.2.2 To preserve flight recorder records, flight recorders shall be deactivated upon completion of flight time following an accident or incident. The flight recorders shall not be reactivated before their disposition as determined in accordance with ICAO Annex 13.

Note 1.- The need for removal of the flight recorder records from the aircraft will be determined by the investigation authority in the State conducting the investigation with due regard to the seriousness of an occurrence and the circumstances, including the impact on the operation.

Note 2.- The operator/owner's responsibilities regarding the retention of flight recorder records are contained in Section II, Chapter 9, 9.6.

4.7.4.3 Continued serviceability

4.7.4.3.1 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 4.

4.7.4.4 Flight recorders electronic documentation

4.7.4.4.1 The documentation requirement concerning FDR parameters provided by operator/owners 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.

4.8 Emergency Locator Transmitter (ELT)

4.8.1 All helicopters operating in performance Class 1 and 2 shall be equipped with at least one automatic ELT and, when operating on flights over water as described in 4.3.1a), with at least one automatic ELT and one ELT(S) in a raft or life jacket.

4.8.2 All helicopters operating in performance Class 3 shall be equipped with at least one automatic ELT and, when operating on flights over water as described in 4.3.1 b), with at least one automatic ELT and one ELT(S) in a raft or life jacket.

4.8.3 ELT equipment carried to satisfy the requirements of 4.8.1 and 4.8.2 shall operate in accordance with the relevant provisions of CAD 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.

4.9 Helicopters required to be equipped with a pressure-altitude reporting transponder

4.9.1 Unless exempted by the CAAM, all helicopters shall be equipped with a pressure-altitude reporting transponder which operates in accordance with the relevant provisions of CAD 10, Volume IV.

4.9.2 All helicopters shall be equipped with a pressure-altitude reporting transponder which operates in accordance with the relevant provisions of CAD 10, Volume IV.

Note.- The provisions in 4.9.1 and 4.9.2 are intended to support the effectiveness of ACAS as well as to improve the effectiveness of air traffic services. Effective dates for carriage requirements of ACAS are contained in CAD 6, Part I. 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. To this end, exemptions from the carriage requirement for pressure-altitude reporting transponders could be given by designating airspace where such carriage is not required.

4.10 Microphones

4.10.1 Whenever a radio communication and/or radio navigation system is required, an operator shall not conduct operations unless the helicopter is equipped with a headset with boom microphone or equivalent and a transmit button on the flight controls for each required pilot and/or crew member at his working station

4.10.2 Each flight crew member required to be on flight deck duty shall wear the headset with boom microphone or equivalent and use it as the primary device to listen to the voice communications with Air Traffic Services:

a) on the ground:

   1) when receiving the ATC departure clearance via voice communication.
   2) when engines are running.

b) in flight below transition altitude or 10 000 feet, whichever is higher, and

c) whenever deemed necessary by the pilot-in-command.

4.10.3 In the conditions of paragraph 4.10.1 above, the boom microphone or equivalent shall be in a position which permits its use for two-way radio communications.

4.11 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)

4.11.1 Where helicopters are equipped with automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, or any combination of those systems into a hybrid system, criteria for the use of such systems for the safe operation of a helicopter shall be established by the State of Registry.

Note.- Information regarding a HUD or equivalent displays, including references to RTCA and EUROCAE documents, is contained in the Manual of All-Weather Operations (ICAO Doc 9365).

4.11.2 In establishing operational criteria for the use of automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS, the State of Registry shall require that:

a) the equipment meets the appropriate airworthiness certification requirements;

b) the operator/owner has carried out a safety risk assessment associated with the operations supported by the automatic landing systems, a HUD or equivalent displays, EVS, SVS or CVS;

c) the operator/owner 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.

Note 1.- Guidance on safety risk assessments is contained in the Safety Management Manual (SMM) (ICAO Doc 9859).

Note 2.- Guidance on establishing operational criteria is contained in Attachment G.

4.12 Electronic Flight Bags (EFBs)

Note.- Guidance on EFB equipment, functions and establishing criteria for their operational use is contained in the Manual on Electronic Flight Bags (EFBs) (ICAO Doc 10020).

4.12.1 EFB equipment

4.12.1.1 Where portable EFBs are used on board a helicopter, the pilot-in-command and the owner shall ensure that they do not affect the performance of the helicopter systems, equipment or the ability to operate the helicopter.

4.12.2 EFB functions

4.12.2.1 Where EFBs are used on board a helicopter the pilot-in-command and/or the owner shall:

a) assess the safety risk(s) associated with each EFB function;

b) establish the procedures for the use of, and training requirements for, the device and each EFB function; and

c) ensure that, in the event of an EFB failure, sufficient information is readily available to the flight crew for the flight to be conducted safely.

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

4.12.2.2 The operational use of EFB functions to be used for the safe operation of helicopters shall be approved by the CAAM.

4.12.2.3 Operators are required to seek a specific approval prior to operational use of EFB functions.

4.12.2.4 EFB specific approval

4.12.2.4.1 To obtain CAAM approval for the use of EFBs, the pilot-in-command and/or the owner/operator shall:

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

b) the operator/owner has assessed the risks associated with the operations supported by the EFB function(s);

c) the operator/owner has established requirements for redundancy of the information (if appropriate) contained in and displayed by the EFB function(s);

d) the operator/owner has established and documented procedures for the management of the EFB function(s) including any databases it may use; and

e) the operator/owner has 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) (ICAO Doc 9859).

4.12.3 Continuing airworthiness and training for maintenance personnel.

4.12.3.1 The operator shall establish a documented maintenance procedure to ensure the EFB is well maintained.

4.12.3.2 For the rechargeable lithium-type batteries, the operator shall ensure that the maintenance procedures meet the Original Equipment Manufacturer (OEM)'s recommendations.

4.12.3.3 The operator shall review and update the following documents to reflect the operation of EFB as applicable:

d) Maintenance program

e) Minimum Equipment List (MEL); and

f) Aircraft Flight Manual Supplement (AFMS).

4.12.3.4 The operator shall develop a training program for all the maintenance personnel who are involved with the EFB operations. The training program shall consist of initial and recurrent training and include at least the overview of the EFB specificities, maintenance procedures and safety management. The operator shall regularly review the training program to ensure that the training program is relevant with the current technologies and effectively implemented.

Note – Guidance on EFB equipment, functions and operational approval is contained in the CAGM 6008(V) – EFB and ICAO Doc 10020.

4.13 Helicopter operated under an Article 83 *bis* agreement

Note.— Guidance concerning the transfer of responsibilities by the State of Registry to the State of the principal location of a general aviation operator in accordance with Article 83 bis is contained in Doc 10059.

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

Note.— Guidance regarding the agreement summary is contained in Doc 10059.

4.13.2 The agreement summary of an Article 83 *bis* agreement shall be accessible to a CAAM inspector to determine which functions and duties are transferred by the State of Registry to the State of the principal location of a general aviation operator under the agreement, when conducting surveillance activities such as ramp checks.

Note.— Guidance for the civil aviation safety inspector conducting an inspection of an aeroplane operated under an Article 83 bis agreement is contained in the Manual of Procedures for Operations Inspection, Certification and Continued Surveillance (Doc 8335).

4.13.3 The agreement summary shall be transmitted to ICAO together with the Article 83 *bis* Agreement for registration with the ICAO Council by the State of Registry or the State of the principal location of a general aviation operator.

Note.— The agreement summary transmitted with the Article 83 bis agreement registered with the ICAO Council contains the list of all aircraft affected by the agreement. However, the certified true copy to be carried on board as per 4.13.1 will need to list only the specific aircraft carrying the copy.

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5 Helicopter Communication, Navigation and Surveillance Equipment

5.1 Communication equipment

5.1.1 A helicopter to be operated in accordance with IFR or at night shall be provided with radio communication equipment. Such equipment shall be capable of conducting two-way communication with those aeronautical stations and on those frequencies 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 When compliance with 5.1.1 requires that more than one communication equipment unit be provided, each shall be independent of the other or others to the extent that a failure in any one will not result in failure of any other.

5.1.3 A helicopter to be operated in accordance with VFR, but as a controlled flight, shall, unless exempted by the appropriate authority, be provided with radio communication equipment capable of conducting two-way communication at any time during flight with such aeronautical stations and on such frequencies as may be prescribed by the appropriate authority.

5.1.4 A helicopter to be operated on a flight to which the provisions of 4.3 or 4.4 apply shall, unless exempted by the appropriate authority, be provided with radio communication equipment capable of conducting two-way communication at any time during flight with such aeronautical stations and on such frequencies as may be prescribed by the appropriate authority.

5.1.5 The radio communication equipment required in accordance with 5.1.1 to 5.1.4 shall provide for communication on the aeronautical emergency frequency 121.5 MHz.

5.1.6 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 5.1.1 to 5.1.5:

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 State of Design or State of Registry; and

c) where the helicopter is operated in accordance with a MEL, 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 the

Performance-based Communication and Surveillance (PBCS) Manual (ICAO Doc 9869).

5.1.7 The operator / owner shall, for operations where an RCP specification for PBC has been prescribed, ensure that they establish and document the following:

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.

e) the equipment in accordance with the required communication performance;

f) identify the specific aircraft to be used for the operations for which approval is sought.

5.1.8 With respect to those aircraft's mentioned in 5.1.6, the CAAM will, for Malaysian registered (9M) aircraft's:

a) receive reports of observed communication performance issued by monitoring programmes established in accordance with CAD 11, Chapter 3, 3.3.5.2; and

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

5.2 Navigation equipment

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

a) in accordance with its 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. For international general aviation, landmarks shall be located at least every 110km (60NM).

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 5.2.1:

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

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

c) where the helicopter is operated in accordance with a MEL, have information relevant to the helicopter navigation specification capabilities included in the MEL.

Note.- Guidance on helicopter documentation is contained in the Performance-based Navigation (PBN) Manual (ICAO Doc 9613).

5.2.3 The operator / owner shall, for operations where a navigation specification for PBN has been prescribed, ensure that they establish and document the following:

a) normal and abnormal procedures, including contingency procedures;

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

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

d) appropriate maintenance procedures to ensure continued airworthiness, in accordance with the appropriate navigation specifications.

Note 1.- Guidance on safety risks and mitigations for PBN operations, in accordance with CAD 19, are contained in the Performance-based Navigation (PBN) Operational Approval Manual (ICAO Doc 9997).

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

5.2.4 The owner / operator shall seek specific approval for operations based on PBN authorisation required (AR) navigation specifications.

Note.- Guidance on specific approvals for PBN authorisation required (AR) navigation specifications is contained in the Performance-based Navigation (PBN) Operational Approval Manual (ICAO Doc 9997).

5.2.5 The 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 5.2.1 and, where applicable, 5.2.2.

Note.- For general aviation, this requirement may be met by means other than the duplication of equipment.

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 affected. 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 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 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) where the helicopter is operated in accordance with a MEL, 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 (ICAO Doc 9924).

Note 2.- Information on RSP specifications for performance-based surveillance is contained in the Performance-based Communication and Surveillance (PBCS) Manual (ICAO Doc 9869).

5.3.3 The operator / owner shall, for operations where an RSP specification for PBS has been prescribed, ensure that they establish and document the following:

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 With respect to those aircraft's mentioned in 5.3.2, the CAAM will, for Malaysian registered (9M) aircraft:

a) receive the reports of observed surveillance performance issued by monitoring programmes established in accordance with CAD11, Chapter 3, 3.3.5.2; and

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

6 Helicopter Continuing Airworthiness

6.1 Operator's continuing airworthiness responsibilities

6.1.1 The owner of a helicopter, or in the case where it is leased, the lessee, shall ensure that:

a) the helicopter is maintained in an airworthy condition;

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

c) the certificate of airworthiness of the helicopter remains valid; and

d) The maintenance of the helicopter is performed in accordance with a maintenance programme acceptable to the CAAM.

6.1.2 The owner or the lessee shall not operate the helicopter unless maintenance on the helicopter, including any associated engine, rotor and part, is carried out:

a) by an organisation complying with CAD 8, Part II, Chapter 6 that is either approved by CAAM or is approved by another Contracting State and is accepted by CAAM.

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

Note: Refer CAD 6801 Continuing Airworthiness of Aircraft (CAAM Part M)

Note: Refer CAD 6802 Continuing Airworthiness Management Organisation (CAAM Part M Subpart G)

6.2 Continuing Airworthiness Records

6.2.1 The owner shall ensure that the following records are kept for the periods mentioned in 6.2.2:

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

b) the current status of compliance with all mandatory continuing airworthiness information;

c) appropriate details of modifications and repairs to the helicopter;

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

e) the current status of the helicopter's compliance with the maintenance programme; and

f) the detailed maintenance records to show that all requirements for signing of a maintenance release have been met.

6.2.2 The records in 6.2.1 a) to f) shall be kept for a minimum period of 12 months after the unit to which they refer has been permanently withdrawn from service.

6.2.3 The lessee of a helicopter shall comply with the requirements of 6.2.1 and 6.2.2, as applicable, while the helicopter is leased.

6.2.4 Records kept and transferred in accordance with 6.2 shall be maintained in a form and format that ensures readability, security and integrity of the records at all times.

6.3 Continuing airworthiness information

6.3.1 The owner of a helicopter over 3175 kg maximum certificated take-off mass, or in the case where it is leased, the lessee, shall, as required by CAAM or the State of Registry, ensure that the information resulting from maintenance and operational experience with respect to continuing airworthiness is transmitted as required by CAD 8, Part II, Chapter 4.

6.4 Modifications and repairs

6.4.1 All modifications and repairs shall comply with airworthiness requirements acceptable to the State of Registry. Procedures shall be established to ensure that the substantiating data supporting compliance with the airworthiness requirements are retained.

6.5 Maintenance release

6.5.1 When maintenance is carried out by an approved maintenance organisation, the maintenance release shall be issued by the approved maintenance organisation in accordance with the provisions of CAD 8, Part II, Chapter 6.

7 Helicopter Flight Crew

7.1 Qualifications

7.1.1 The pilot-in-command shall ensure that the licences of each flight crew member have been issued or rendered valid by CAAM in accordance with CAD 1 - PEL, are properly rated and of current validity in accordance with CAD 1 – PEL, and shall be satisfied that flight crew members have maintained competence.

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

7.2 Composition of the flight crew

7.2.1 The number and composition of the flight crew shall not be less than that specified in the flight manual or other documents associated with the certificate of airworthiness.

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CAD 6 - PART 3

HELICOPTER

APPENDICES

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Appendices

Appendix 1 - Safety Oversight of Air Operators

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Appendix 2 - Additional Requirements for Operations of Helicopters in Performance Class 3 in Instrument Meteorological Conditions (IMC)

Note. – (Section II, Chapter 3, 3.4.1, refers)

Airworthiness and operations requirements provided in accordance with Section II, Chapter 3, 3.4.1, shall satisfy the following**:**

1 Engine Reliability

1.1 Attaining and maintaining approval for engines used by helicopters operating in performance Class 3 in IMC:

1.1.1 In order to attain initial approval for existing in-service engine types, reliability shall be shown to have a nominal power loss rate of less than 1 per 100000 engine hours based on a risk management process.

Note - Power loss in this context is defined as any significant loss of power, the cause of which may be traced to engine or engine component, design, maintenance or installation, including design or installation of the fuel ancillary or engine control systems. (See attachment F.)

1.1.2 In order to attain initial approval for new engine types, the State of Design shall assess engine models for acceptance for operations in performance Class 3 in IMC on a case-by-case basis.

1.1.3 In order to maintain approval, the State of Design shall, through the continuing airworthiness process, ensure that engine reliability remains consistent with the intent of the Standard contained in 1.1.1.

1.2 The operator shall be responsible for a programme for ongoing engine trend monitoring.

1.3 To minimise the probability of in-flight engine failure, the engine shall be equipped with:

a) for turbine engines: a re-ignition system that activates automatically or a manually selectable continuous ignition system unless the engine certification has determined that such a system is not required, taking into consideration the likely environmental conditions in which the engine is to be operated;

b) a magnetic particle detection or equivalent system that monitors the engine, accessories gearbox, and reduction gearbox, and which includes a flight deck caution indication; and

c) a means that would permit continuing operation of the engine through a sufficient power range to safely complete the flight in the event of any reasonably probable failure of the fuel control unit.

2 Systems and Equipment

Helicopters operating in performance Class 3 in IMC shall be equipped with the following systems and equipment intended to ensure continued safe flight or to assist in achieving a safe forced landing after an engine failure, under all allowable operating conditions:

a) either two separate electrical generating systems, each one capable of supplying all probable combinations of continuous in-flight electrical loads for instruments, equipment and systems required in IMC; or a primary electrical source and a

standby battery or other alternate source of electric power that is capable of supplying 150 per cent of electrical loads of all required instruments and equipment necessary for safe emergency operations of the helicopter for at least one hour; and

b) an emergency electrical supply system of sufficient capacity and endurance, following loss of all normally generated power to, as a minimum:

Note.- If a battery is used to satisfy the requirement for a second power source (see 2 a) above), an additional electrical power supply may not be required.

1) maintain the operation of all essential flight instruments, communication and navigation systems during a descent from the maximum certificated altitude in an autorotational configuration to the completion of a landing;

2) maintain the operation of the stabilisation system, if applicable;

3) lower the landing gear, if applicable;

4) where required, provide power to one pitot heater, which must serve an airspeed indicator clearly visible to the pilot;

5) provide for the operation of the landing light;

6) provide for one engine restart, if applicable; and

7) provide for the operation of the radio altimeter;

c) a radio altimeter;

d) an autopilot if intended as a substitute for a second pilot. In these cases, the operator's approval shall clearly state any conditions or limitations on its use;

e) a means to provide for at least one attempt at engine re-start;

f) an area navigation system approved for use in IFR, capable of being used to locate suitable landing areas in the event of an emergency;

g) a landing light that is independent of retractable landing gear and is capable of adequately illuminating the touchdown area in a night forced landing; and

h) an engine fire warning system.

3 Minimum Serviceability Requirements — Operating Equipment

The CAAM specifies the minimum serviceability requirements for operating equipment in helicopters operating in performance Class 3 in IMC.

4 Operations Manual Information

The operations manual shall include limitations, procedures, approval status and other information relevant to operations in performance Class 3 in IMC.

5 Event Reporting

5.1 The operator approved to conduct operations by helicopters in performance Class 3 in IMC shall report all significant failures, malfunctions or defects to CAAM and to the manufacture.

5.2 Operations in performance Class 3 in IMC shall be monitored by the CAAM so as to be able to take any actions necessary to ensure that the intended safety level is maintained.

Major events or trends of particular concern to the appropriate type certificate holder and to the State of Design shall be notified by the CAAM.

6 Operator Planning

Operator route planning shall take account of all relevant information in the assessment of intended routes or areas of operations, including the following:

a) the nature of the terrain to be overflown, including the potential for carrying out a safe forced landing in the event of an engine failure or major malfunction;

b) weather information, including seasonal and other adverse meteorological influences that may affect the flight; and

c) other criteria and limitations as specified by CAAM.

7 Flight Crew Experience, Training and Checking

7.1 The State of the Operator shall prescribe the minimum flight crew experience for helicopters operating in performance Class 3 in IMC.

7.2 The operator's flight crew training and checking programme shall be appropriate to operations in performance Class 3 in IMC, covering normal, abnormal and emergency procedures and, in particular, detection of engine failure including descent to a forced landing in IMC and, for single engine helicopters, entry into a stabilised autorotation.

8 Operator Certification or Validation

The operator shall demonstrate the ability to conduct operations in performance Class 3 in IMC through a certification and approval process specified by the CAAM.

Note.- Guidance on the airworthiness and operational requirements is contained in Attachment F.

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Appendix 3 - Air Operator Certificate (AOC)

Note. – (Section II, Chapter 2, 2.2.1.5 and 2.2.1.6, refers)

1 Purpose and Scope

1.1 The AOC and its associated model specific operations specifications shall contain the minimum information required in CAD 6004 respectively, in a standardised format.

1.2 The air operator certificate and its associated operations specifications shall define the operations for which the operator is authorised.

Note. — Attachment D, paragraph 3.2.2, contains additional information that may be listed in the operations specifications associated with the air operator certificate.

2 AOC Template

Note. – Details on the AOC template can be found in Attachment C of the CAGM 6004 – AOC.

3 Operations Specifications for Each Aircraft Model

3.1 For each helicopter model in the operator's fleet, identified by helicopter make, model and series, the following list of authorisations, conditions and limitations shall be included: issuing authority contact details, operator name and AOC number, date of issue and signature of the authority representative, aircraft model, types and area of operations, special limitations and authorisations.

Note.- If authorisations and limitations are identical for two or more models, these models may be grouped in a single list

3.2 The operations specifications layout referred to in Chapter 2, 2.2.1.6, can be found in Attachment C of the CAGM 6004 – AOC.

Note.- The MEL constitutes an integral part of the operations manual.

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Appendix 4 - Flight Recorders

Note. – (Section II, Chapter 4, 4.3 and Section III, Chapter 4, 4.7, refer)

The material in this Appendix concerns flight recorders intended for installation in helicopters engaged in commercial air navigation. Crash-protected flight recorders comprise one or more of the following-systems:

- a flight data recorder (FDR),
- a cockpit voice recorder (CVR),
- an airborne image recorder (AIR),
- a data link recorder (DLR).

Lightweight flight recorders comprise one or more of the following systems:

- an aircraft data recording system (ADRS),
- a cockpit audio recording system (CARS),
- an airborne image recording system (AIRS),
- a data link recording system (DLRS).

1 GENERAL REQUIREMENTS

1.1 Non-deployable flight recorder containers shall be painted a distinctive orange colour.

1.2 Non-deployable crash-protected flight recorder containers shall:

a) carry reflective material to facilitate their location; and

b) have securely attached an automatically activated underwater locating device operating at a frequency of 37.5 kHz, this device shall operate for a minimum of 90 days.

1.3 Automatic deployable flight recorder containers shall:

a) be painted a distinctive orange colour, however the surface visible from outside the helicopter may be of another colour;

b) carry reflective material to facilitate their location; and

c) have an integrated automatically activated ELT.

1.4 The flight recorder systems shall be installed so that:

a) the probability of damage to the recordings is minimised;

b) there is an aural or visual means for pre-flight checking that the flight recorder systems are operating properly;

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 minimised.

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 specialised replay or copying techniques.

1.5 The flight recorder systems shall be installed so that they receive electrical power from a bus that provides the maximum reliability for operation of the flight recorder systems without jeopardising service to essential or emergency loads.

1.6 The flight recorder systems, when tested by methods approved by the appropriate certificating authority, shall be demonstrated to be suitable for the environmental extremes over which they are designed to operate.

1.7 Means shall be provided for an accurate time correlation between the flight recorder systems functions.

1.8 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.

2 Flight Data Recorder (FDR) And Aircraft Data Recording System (ADRS)

2.1 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.

2.2 Parameters to be recorded

Note.- In previous editions of CAD 6, Part 3, types of recorders were defined to capture the first evolutions of FDRs.

2.2.1 The parameters that satisfy the requirements for FDRs, are listed in Table A4-1. 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.

2.2.2 The following parameters shall satisfy the requirements for flight path and speed:

- pressure altitude
- indicated airspeed
- outside air temperature

- heading
- normal acceleration
- lateral acceleration
- longitudinal acceleration (body axis)
- time or relative time count
- navigation data*: drift angle, wind speed, wind direction, latitude/longitude
- radio altitude*

2.2.3 If further FDR recording capacity is available, recording of the following additional information shall be considered:

a) additional operational information from electronic displays, such as electronic flight instrument systems (EFIS), electronic centralised aircraft monitor (ECAM) and engine indication and crew alerting system (EICAS); and

b) additional engine parameters (EPR, N1, fuel flow, etc.).

2.2.4 The parameters that satisfy the requirements for ADRS are listed in Table A4-3.

2.3 Additional information

2.3.1 The measurement range, recording interval and accuracy of parameters on installed equipment is usually verified by methods approved by the appropriate certificating authority.

2.3.2 Documentation concerning parameter allocation, conversion equations, periodic calibration and other serviceability/maintenance information shall be maintained by the operator/owner. The documentation shall be sufficient to ensure that accident investigation authorities have the necessary information to read out the data in engineering units.

3 Cockpit Voice Recorder (CVR) and Cockpit Audio Recording System (CARS)

3.1 Start and stop logic

The CVR or CARS shall start to record prior to the 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.

3.2 Signals to be recorded

3.2.1 The CVR shall record simultaneously on four separate channels, or more, at least the following:

a) voice communication transmitted from or received in the aircraft by radio;

b) aural environment on the flight deck;

c) voice communication of flight crew members on the flight deck using the interphone system, if installed;

d) voice or audio signals identifying navigation or approach aids introduced in the headset or speaker; and

e) voice communication of flight crew members using the passenger address system, if installed.

3.2.2 The preferred CVR audio allocation should be as follows:

a) pilot-in-command audio panel;

b) co-pilot audio panel;

c) additional flight crew positions and time reference; and

d) cockpit area microphone.

3.2.3 The CARS shall record simultaneously on two separate channels, or more, at least the following:

a) voice communication transmitted from or received in the helicopter by radio;

b) aural environment on the flight deck; and

c) voice communication of flight crew members on the flight deck using the helicopter's interphone system, if installed.

3.2.4 The preferred CARS audio allocation should be as follows:

a) voice communication; and

b) aural environment on the flight deck.

4 Airborne Image Recorder (AIR) and Airborne Image Recording System (AIRS)

4.1 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.

4.2 Classes

4.2.1 A Class A AIR or AIRS captures the general cockpit area in order to provide data supplemental to conventional flight recorders.

Note 1.- To respect crew privacy, the cockpit area view may be designed as far as practical to exclude the head and shoulders of crew members whilst seated in their normal operating position.

Note 2.- There are no provisions for Class A AIRs or AIRS in this document.

4.2.2 A Class B AIR or AIRS captures data link message displays.

4.2.3 A Class C AIR or AIRS captures instruments and control panels.

Note.- A Class C AIR or AIRS may be considered as a means for recording flight data where it is not practical or is prohibitively expensive to record on an FDR, or where an FDR is not required.

5 Data Link Recorder (DLR)

5.1 Applications to be recorded

5.1.1 Where the helicopter flight path is authorised 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.

5.1.2 Messages applying to the applications listed in Table A4-2 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.

6 Inspections of Flight Recorder Systems

6.1 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.

6.2 FDR systems or ADRS, CVR systems or CARS, and AIR systems or AIRS shall have recording inspection intervals of one year; subject to the approval from the appropriate regulatory authority, this period may be extended to two years provided these systems have demonstrated a high integrity of serviceability and self-monitoring. DLR systems or DLRS shall have recording inspection intervals of two years; subject to the approval from the appropriate regulatory authority, this period may be extended to four years provided these systems have demonstrated high integrity of serviceability and self-monitoring.

6.3 Recording inspections shall be carried out as follows:

a) an analysis of the recorded data from the flight recorders shall ensure that the recorder operates correctly for the nominal duration of the recording;

b) the analysis of the FDR or ADRS recording shall evaluate the quality of the recorded data to determine if the bit error rate (including those errors introduced by recorder, the acquisition unit, the source of the data on the helicopter and by the tools used to extract the data from the recorder) is within acceptable limits and to determine the nature and distribution of the errors;

c) the FDR or ADRS recording from a complete flight shall be examined in engineering units to evaluate the validity of all recorded parameters. Particular attention shall be given to parameters from sensors dedicated to the FDR or ADRS. Parameters taken from the aircraft's electrical bus system need not be checked if their serviceability can be detected by other aircraft systems;

d) 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;

e) 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;

f) 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

g) 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.

6.4 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.

6.5 A report of the recording inspection shall be made available on request to regulatory authorities for monitoring purposes.

6.6 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.

Table A4-1. Parameter Characteristics for Flight Data Recorders

Serial number	Parameter	Applicability	Measurement range	Maximum sampling and recording interval (seconds)	Accuracy limits (sensor input compared to FDR readout)	Recording resolution
1	Time (UTC when available, otherwise relative time count or GNSS time sync)		24 hours	4	±0.125% /h	1s
2	Pressure altitude		–300m (–1000ft) to maximum certificated altitude of aircraft +1500m (+5000ft)	1	±30m to ±200m (±100ft to ±700ft)	1.5m (5ft)
3	Indicated airspeed		As the installed pilot display measuring system	1	±3%	1kt
4	Heading		360°	1	±2°	0.5°
5	Normal acceleration		–3g to +6g	0.125	±0.09g excluding a Datum error of ±0.045g	0.004g
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/m2 (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	0.25	±3% of maximum range	0.5% for maximum certified load
20	Longitudinal acceleration		±1g	0.25	±0.015 g excluding a datum error of ±0.05g	0.004 g
21	Lateral acceleration		±1 g	1	±0.015g excluding a Datum error of ±0.05g	0.004 g
22*	Radio altitude		–6 m to 750 m (–20ft to 2500ft)	1	±0.6m (±2ft) or ±3% whichever is greater below 150m (500ft) and ±5% above 150m (500ft)	0.3m (1ft) below 150m (500ft), 0.3m (1ft) + 0.5% of full range above 150m (500ft)
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)	4	-	-
27	Each navigation receiver frequency selection		Sufficient to determine selected frequency	4	As installed	-
28*	DME 1 and 2 distances		0–370km (0–200NM)		As installed	1852m (1NM)

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 (T4)		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
44*	Selected flight path (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
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*	Multifunction/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
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 A4-2. 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 A4-3. Parameter Characteristics 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		±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	–300m (–1000ft) to maximum certificated Altitude of aircraft +1500m (5000ft)	2 (1 if available)	As installed (±15 m (±50ft) recommended)	1.5m (5ft)	
	d) Ground speed	0–1000kt	2 (1 if available)	As installed (±5kt recommended)	1kt	
	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
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	

		Minimum	Maximum recording	Minimum recording	Minimum recording	

N°	Parameter name	recording range	interval in seconds	accuracy	resolution	Remarks
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 1.5m (5ft)	
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)	1kt (0.5kt 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 engine 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 engine helicopters
24	Fuel quantity	Full range	4	As installed	1% of full range	
25	Exhaust gas temperature	Full range	Each engine each Second	As installed	2% of full range	
26	Emergency voltage	Full range	Each engine each Second	As installed	1 Volt	
27	Trim surface position	Full range or each discrete position	1	As installed	0.3% of full Range	
28	Landing gear position	Each discrete position*	Each gear every two seconds	As installed		*Where available, record up-and locked and down and-locked position
29	Novel/unique aircraft features	As required	As required	As required	As required	

Appendix 5 - General Aviation Specific Approvals

Note. – (Section III, Chapter 1, 1.4, refers)

1. PURPOSE AND SCOPE

1.1 Specific approvals are included in the Certificate of Approval and contains the all the specific approvals issued to the holder.

Note.- When the operations to be conducted require a specific approval, a copy of the document(s) needs to be carried on board (see Section II, Chapter 4, 4.1.3.1).

1 Specific Approval Template

SPECIFIC APPROVAL				
ISSUING AUTHORITY and CONTACT DETAILS[1] Issuing Authority[1] _____ Address _____ Signature: _____ Date[2]: _____ Telephone: _____ Fax: _____ Email: _____				
OWNER/OPERATOR Name[3]: _____ Address: _____ Telephone: _____ Fax: _____ Email: _____				
Aircraft model[4] and registration marks:				
SPECIFIC APPROVAL	**YES**	**NO**	**DESCRIPTION[5]**	**REMARKS**
Low visibility operations				
Approach and landing	☐	☐	CAT[6]: _____ RVR: _____ m DH: _____ ft	
Take-off	☐	☐	RVR[7]: _____ m	
Operational credit(s)	☐	☐	[8]	
RVSM	☐	☐		
AR navigation specifications for PBN operations	☐	☐	[9]	
Other [10]	☐	☐		

Notes:-

1. *Civil Aviation Authority name and contact details, including the telephone country code and email if available.*
2. *Issuance date of the specific approval (dd-mm-yyyy) and signature of the authority representative.*
3. *Owner or operator's name and address.*
4. *Insert the helicopter make, model and series, or master series, if a series has been designated The CAST/ICAO taxonomy is available at: http://www.intlaviationstandards.org/.*
5. *List in this column the most permissive criteria for each approval or the approval type (with appropriate criteria).*
6. *Insert the applicable precision approach category (CAT II, IIIA, IIIB or IIIC). Insert the minimum RVR in metres and decision height in feet. One line is used per listed approach category.*
7. *Insert the approved minimum take-off RVR in metres. One line per approval may be used if different approvals are granted.*
8. *List the airborne capabilities (i.e. automatic landing, HUD, EVS, SVS, CVS) and associated operational credit(s) granted.*
9. *Performance-based navigation (PBN): one line is used for each PBN AR navigation specification approval (e.g. RNP AR APCH), with appropriate limitations listed in the "Description" column.*
10. *Other specific approvals or data can be entered here, using one line (or one multi-line block) per approval (e.g. specific approach operations approval, MNPS).*

Appendix 6
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Appendix 7 – Fatigue risk management system requirements

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Appendix 8 - Contents of An Operations Manual

Note. – (Supplementary to Section II, Chapter 2, 2.2.3.1)

1 Organisation

1.1 An operations manual, which may be issued in separate parts corresponding to specific aspects of operations, provided in accordance with Section II, Chapter 2, 2.2.3.1, shall be organised with the following contents and structure:

a) General;

b) Aircraft operating information;

c) Routes and aerodromes; and

d) Training.

1.2 General rules for OM:

a) An operator shall ensure that the OM contains all instructions and information necessary for operations personnel to perform their duties.

b) An operator shall ensure that the contents of the OM, including all amendments or revisions, do not contravene the conditions contained in the Air Operator Certificate (AOC) or any applicable regulations and are acceptable to, or, where applicable, approved by, the CAAM.

c) Unless otherwise approved by the CAAM, an operator must prepare the OM in the English language. In addition, an operator may translate and use that manual, or parts thereof, into another language.

d) Should it become necessary for an operator to produce new OMs or major parts/volumes thereof, he must comply with the provision in sub-paragraph (c) above.

e) An operator may issue an OM in separate volumes.

f) An operator shall ensure that all operations personnel have easy access to a copy of each part of the OM which is relevant to their duties.

g) In addition, the operator shall supply crew members with a personal copy of, or sections from, Parts A and B of the OM as are relevant for personal study.

h) An operator shall ensure that the OM is amended or revised so that the instructions and information contained therein are kept up to date.

i) The operator shall ensure that all operations personnel are made aware of such changes that are relevant to their duties. Approval, acceptance or notification to CAAM is required as appropriate, prior to making any changes to the manual.

j) Each holder of an OM, or appropriate parts of it, shall keep it up to date with the amendments or revisions supplied by the operator.

k) An operator shall supply the CAAM with intended amendments and revisions in advance of the effective date for approval or acceptance by the CAAM.

l) When the amendment concerns any part of the OM which must be approved in accordance with CAD 6, this approval shall be obtained before the amendment becomes effective.

m) When immediate amendments or revisions are required in the interest of safety, they may be published and applied immediately, provided that any approval required has been applied for.

n) An operator shall incorporate all amendments and revisions required by the CAAM.

o) An operator must ensure that information taken from approved documents, and any amendment of such approved documentation, is correctly reflected in the OM and that the OM contains no information contrary to any approved documentation. However, this requirement does not prevent an operator from using more conservative data and procedures.

p) An operator must ensure that the contents of the OM are presented in a form in which they can be used without difficulty. The design of the OM shall observe Human Factors principles.

q) An operator may be permitted by the CAAM to present the OM or parts thereof in a form other than on printed paper. In such cases, an acceptable level of accessibility, usability and reliability must be assured.

r) The use of an abridged form of the OM does not exempt the operator from the following requirements:

1) That the current parts of the OM relevant to the duties of the crew are carried on each flight.

2) Those parts of the OM which are required for the conduct of a flight are easily accessible to the crew on board the aircraft.

3) The current Aircraft Flight Manual is carried in the aircraft unless the CAAM has accepted that the OM contains relevant information for that aircraft.

2 Contents

The operations manual referred to in 1.1 shall contain at the least the following:

2.1 General

2.1.1 Instructions outlining the responsibilities of operations personnel pertaining to the conduct of flight operations.

2.1.2 Information and policy relating to fatigue management including:

a) policies pertaining to the flight time, flight duty periods, duty period limitations and rest requirements for flight and cabin crew members in accordance with Section II, Chapter 2, 2.8; and

b) where applicable, policy and documentation pertaining to the operator's FRMS.

2.1.3 A list of the navigation equipment to be carried, including any requirements relating to operations where performance-based navigation is prescribed.

2.1.4 The circumstances in which a radio listening watch is to be maintained.

2.1.5 The method for determining minimum flight altitudes.

2.1.6 The methods for determining heliport operating minima.

2.1.7 Safety precautions during refuelling with passengers on board.

2.1.8 Ground handling arrangements and procedures.

2.1.9 Procedures, as prescribed in CAD 12, for pilots-in-command observing an accident.

2.1.10 The flight crew for each type of operation including the designation of the succession of command.

2.1.11 Specific instructions for the computation of the quantities of fuel and oil to be carried, having regard to all circumstances of the operation including the possibility of loss of pressurisation and the failure of one or more engines while en-route.

2.1.12 The conditions under which oxygen shall be used and the amount of oxygen determined in accordance with Section II, Chapter 2, 2.3.8.2.

2.1.13 Instructions for mass and balance control.

2.1.14 Instructions for the conduct and control of ground de-icing/anti-icing operations.

2.1.15 The specifications for the operational flight plan.

2.1.16 Standard operating procedures (SOP) for each phase of flight.

2.1.17 Instructions on the use of normal checklists and the timing of their use.

2.1.18 Departure contingency procedures.

2.1.19 Instructions on the maintenance of altitude awareness.

2.1.20 Instructions on the clarification and acceptance of ATC clearances, particularly where terrain clearance is involved.

2.1.21 Departure and approach briefings.

2.1.22 Route and destination familiarisation.

2.1.23 Conditions required to commence or to continue an instrument approach.

2.1.24 Instructions for the conduct of precision and non-precision instrument approach procedures.

2.1.25 Allocation of flight crew duties and procedures for the management of crew workload during night and IMC instrument approach operations.

2.1.26 Information and instructions relating to the interception of civil aircraft including:

a) procedures, as prescribed in CAD 2, for pilots-in-command of intercepted aircraft; and

b) visual signals for use by intercepting and intercepted aircraft, as contained in CAD 2.

2.1.27 Details of the safety management system (SMS) provided in accordance with Chapters 3 and 4 of CAD 19.

2.1.28 Information and instructions on the carriage of dangerous goods, including action to be taken in the event of an emergency.

Note - Guidance material on the development of policies and procedures for dealing with dangerous goods incidents on board aircraft is contained in Emergency Response Guidance for Aircraft Incidents Involving Dangerous Goods (ICAO Doc 9481).

2.1.29 Security instructions and guidance.

2.1.30 The search procedure checklist provided in accordance with Section II, Chapter 11, 11.1.

2.1.31 Instructions and training requirements for the use of head-up displays (HUD) or enhanced vision systems (EVS) equipment as applicable.

2.1.32 Instructions and training requirements for the use of the EFB, as applicable.

2.2 Aircraft operating information

2.2.1 Certification limitations and operating limitations.

2.2.2 The normal, abnormal and emergency procedures to be used by the flight crew and the checklists relating thereto as required by Section II, Chapter 4, 4.1.4.

2.2.3 Flight planning data for pre-flight and in-flight planning with different thrust/power and speed settings.

2.2.4 Instructions and data for mass and balance calculations.

2.2.5 Instructions for aircraft loading and securing of load.

2.2.6 Aircraft systems, associated controls and instructions for their use, as required by Section II, Chapter 4, 4.1.4.

2.2.7 The minimum equipment list for the helicopter types operated and specific operations authorised, including any requirements relating to operations where performance-based navigation is prescribed.

2.2.8 Checklist of emergency and safety equipment and instructions for its use.

2.2.9 Emergency evacuation procedures, including type-specific procedures, crew coordination, assignment of crew's emergency positions and the emergency duties assigned to each crew member.

2.2.10 The normal, abnormal and emergency procedures to be used by the cabin crew, the checklists relating thereto and aircraft systems information as required, including a statement related to the necessary procedures for the coordination between flight and cabin crew.

2.2.11 Survival and emergency equipment for different routes and the necessary procedures to verify its normal functioning before take-off, including procedures to determine the required amount of oxygen and the quantity available.

2.2.12 The ground-air visual signal code for use by survivors, as contained in CAD 12.

2.3 Routes, aerodromes and heliports

2.3.1 A route guide to ensure that the flight crew will have, for each flight, information relating to communication facilities, navigation aids, aerodromes, instrument approaches, instrument arrivals and instrument departures as applicable for the operation, and such other information as the operator may deem necessary for the proper conduct of flight operations.

2.3.2 The minimum flight altitudes for each route to be flown.

2.3.3 Heliport operating minima for each of the heliports that are likely to be used as heliports of intended landing or as alternate heliports.

2.3.4 The increase of heliport operating minima in case of degradation of approach or heliport facilities.

2.3.5 Instructions for the use of aerodrome operating minima for instrument approaches applicable to the use of HUD and EVS.

2.4 Training

2.4.1 Details of the flight crew training programme and requirements, as required by Section II, Chapter 7, 7.3.

2.4.2 Details of the cabin crew duties training programme as required by Section II, Chapter 10, 10.3.

2.4.3 Details of the flight operations officer/flight dispatcher training programme when employed in conjunction with a method of flight supervision in accordance with Section II, Chapter 2, 2.2.

Note - Details of the flight operations officer/flight dispatcher training programme are contained in Section II, Chapter 8, 8.3.

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Appendix 9 – Requirements of a foreign helicopter pilot for commercial air transport operations.

1 Interpretation

In this appendix, unless the context requires –

Foreign pilot means a person who holds a valid flight crew license granted under the law of any State; and

Malaysian helicopter means a helicopter which is registered in Malaysia under the Civil Aviation Regulation 2016.

2 Regulatory requirements on operator in employing a foreign pilot

2.1 No operator of a Malaysian helicopter or non-Malaysian helicopter shall cause or permit a foreign pilot to fly its helicopter in Malaysia for the purpose of commercial air transport unless the foreign pilot:

a) complies with 1.2.2.1 and Appendix 10 of CAD 1 – PEL;
b) possess a minimum of 1000 hours on any type of helicopter;
c) has completed a Crew Resource Management (CRM) even as a Single Pilot VFR operation; and
d) undergo a minimum of 10 hours flying under supervision of a Malaysian pilot who holds a valid CPL or ATPL, to familiarize himself with the terrain and weather pattern of the operations area which he intends to fly.

2.2 In the case of a short term employment or any other related arrangement of less than 3 months, in addition to the requirements under paragraph 2.1, no operator of a Malaysian helicopter or non-Malaysian helicopter shall cause or permit a foreign pilot to fly its helicopter in Malaysia for the purpose of commercial air transport unless the foreign pilot:

a) have flown at least 25 hours in a helicopter of the same type which he intends to fly, for the last 6 months;
b) has conducted a minimum of 3 take-offs, approaches and landings in a helicopter of the same type which he intends to fly, for the last 90 days;
c) has completed a minimum of 3 days induction course organized by the operator which include topics as follows:

    1) operations area – weather pattern and terrain familiarity;

    2) communication with Air Traffic Controller and the operator; and

    3) handling of helicopter during normal, abnormal and emergency situation.

3 Regulatory requirements of a foreign pilot

3.1 No foreign pilot shall fly in Malaysia, a Malaysian helicopter or non-Malaysian helicopter operated by the operator for the purpose of commercial air transport unless the foreign pilot:

a) complies with 1.2.2.1 and Appendix 10 of CAD 1 – PEL;
b) possess a minimum of 1000 hours on any type pf helicopter;

c) has completed a Crew Resource Management (CRM) even as a Single Pilot VFR operations; and
d) undergo a minimum of 10 hours flying under supervision of a Malaysian pilot who holds a valid CPL or ATPL, to familiarize himself with the terrain and weather pattern of the operations area which he intends to fly.

3.2 In the case of a short term employment or any other related arrangement of less than 3 months, in addition to the requirements under paragraph 3.1, no foreign pilot shall fly in Malaysia, a Malaysian helicopter or non-Malaysian helicopter operated by the operator for the purpose of commercial air transport unless the foreign pilots –

a) have flown at least 25 hours in a helicopter of the same type which he intends to fly, for the last 6 months;
b) has conducted a minimum of 3 take-offs, approaches and landings in a helicopter of the same type which he intends to fly, for the last 90 days;
c) has completed a minimum 3 days induction course organized by the operator which include topics as follows:

1) operations area – weather pattern and terrain familiarity
2) communication with Air Traffic Controller and the operator ; and
3) handling of helicopter during normal, abnormal and emergency situation.

CAD 6 - PART 3

HELICOPTER

ATTACHMENTS

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Attachments

Attachment A - Helicopter Performance and Operating Limitations

Note. – (Supplementary to Section II, Chapter 3, and Section III, Chapter 3)

1 Purpose and scope

This attachment comprises material supplementary to Chapter 3 of Sections II and III that is provided for the purpose of guidance. The CAAM references this material as a basis for establishing its code of performance, but may introduce alternatives or alleviations that would meet the safety objectives of CAD 6.

Note - Quantitative specifications can be found in the Example provided below.

2 Definitions

Category A. With respect to helicopters, means a multi-engined helicopter designed with engine and system isolation features specified in CAD 8, Part IVB, and capable of operations using take-off and landing data scheduled under a critical engine failure concept which assures adequate designated surface area and adequate performance capability for continued safe flight or safe rejected take-off.

Category B. With respect to helicopters, means a single engine or multi-engined helicopter which does not meet Category A standards. Category B helicopters have no guaranteed capability to continue safe flight in the event of an engine failure, and a forced landing is assumed.

3 General

3.1 Helicopters operating in performance Classes 1 and 2 should be certificated in Category A.

3.2 Helicopters operating in performance Class 3 should be certificated in either Category A or Category B (or equivalent).

3.3 Except as permitted by the appropriate authority:

3.3.1 Take-off or landing from/to heliports in a congested hostile environment should only be conducted in performance Class 1.

3.3.2 Operations in performance Class 2 should only be conducted with a safe forced landing capability during take-off and landing.

3.3.3 Operations in performance Class 3 should only be conducted in a non-hostile environment.

3.4 In order to permit variations from 3.3.1, 3.3.2 and 3.3.3, the operator should undertake a risk assessment and presented to the CAAM, considering factors such as:

a) the type of operation and the circumstances of the flight;

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

c) the probability of a critical engine failure and the consequence of such an event;

d) the procedures to maintain the reliability of the engine(s);

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

f) installation and utilisation of a usage monitoring system.

Note 1. – It is recognised that there may be instances in which a safe forced landing may not be possible due to environmental or other factors. Many States have already applied risk management and permitted variations to specific operations such as operations to helidecks where exposure to an engine failure is present without a safe forced landing. Permitting variations based on risk assessment is a normal part of the process for a State developing a code of performance. When operations without suitable areas for safe forced landings are being considered, all relevant factors should be evaluated. These may include the likelihood of the event, the possible consequences, any mitigating measures as well as the potential benefits and costs of the operation. The specific process for conducting this evaluation is to be decided by the CAAM. In any case, appropriate consideration of a safe forced landing should be either implicit or explicit to a performance code's construction. Accident history and other relevant safety data and analysis are crucial to the development of operational regulations in this area. The resulting requirements may take many forms, such as designation of approved operational areas, routes of flight and obstacle clearance requirements.

Note 2. – If there are routes with access to suitable forced landing areas, these should be used for flights into and out of the congested area. Where no such routes exist, evaluation of the operation could include consideration of mitigating factors such as the reliability of the propulsion system in the short periods when flight over a suitable forced landing area is not possible.

Example

Purpose and Scope

The following example provides quantitative specifications to illustrate a level of performance intended by the provisions of Section II, Chapter 3. A State may use this example as a basis for establishing its code of performance, but may introduce variations provided such variations meet the safety objectives of Section II, Chapter 3 and Attachment A.

Abbreviations Specific to Helicopter Operations

Abbreviations

D	Maximum dimension of helicopter
DPBL	Defined point before landing
DPATO	Defined point after take-off
DR	Distance travelled (helicopter)
FATO	Final approach and take-off area
HFM	Helicopter flight manual
LDP	Landing decision point
LDAH	Landing distance available (helicopter)
LDRH	Landing distance required (helicopter)

R	Rotor radius of helicopter
RTODR	Rejected take-off distance required (helicopter)
TDP	Take-off decision point
TLOF	Touchdown and lift-off area
TODAH	Take-off distance available (helicopter)
TODRH	Take-off distance required (helicopter)
V_{TOSS}	Take-off safety speed

1 Definitions

1.1 Only applicable to operations in performance Class 1

Landing distance required (LDRH). The horizontal distance required to land and come to a full stop from a point 15m (50ft) above the landing surface.

Rejected take-off distance required (RTODR). The horizontal distance required from the start of the take-off to the point where the helicopter comes to a full stop following an engine failure and rejection of the take-off at the take-off decision point.

Take-off distance required (TODRH). The horizontal distance required from the start of the take-off to the point at which V_{TOSS}, a selected height and a positive climb gradient are achieved, following failure of the critical engine being recognised at TDP, the remaining engines operating within approved operating limits.

Note.- The selected height stated above is to be determined with reference to either:

a) the take-off surface; or

b) a level defined by the highest obstacle in the take-off distance required.

1.2 Applicable to operations in all performance classes

D. The maximum dimension of the helicopter.

Distance DR. The horizontal distance that the helicopter has travelled from the end of the take-off distance available.

Landing distance available (LDAH). The length of the final approach and take-off area plus any additional area declared available and suitable for helicopters to complete the landing manoeuvre from a defined height.

R. The rotor radius of the helicopter.

Take-off distance available (TODAH). The length of the final approach and take-off area plus the length of helicopter clearway (if provided) declared available and suitable for helicopters to complete the take-off.

Take-off flight path. The vertical and horizontal path, with the critical engine inoperative, from a specified point in the take-off to 300m (1000ft) above the surface.

Touchdown and lift-off area (TLOF). A load bearing area on which a helicopter may touch down or lift off.

V_{TOSS}. Take-off safety speed for helicopters certificated in Category A.

V_y . Best rate of climb speed.

2 General

2.1 Applicability

2.1.1 Helicopters with a passenger seating configuration of more than 19, or helicopters operating to or from a heliport in a congested hostile environment should be operating in performance Class 1.

2.1.2 Helicopters with a passenger seating configuration of 19 or less but more than 9 should be operating in performance Class 1 or 2, unless operating to or from a congested hostile environment in which case the helicopters should be operating in performance Class 1.

2.1.3 Helicopters with a passenger seating configuration of 9 or less should be operating in performance Class 1, 2 or 3, unless operating to or from a congested hostile environment in which case the helicopters should be operating in performance Class 1.

2.2 Significant performance factors

To determine the performance of the helicopter, account should be taken of at least the following factors:

a) mass of the helicopter;

b) elevation or pressure-altitude and temperature; and

c) wind; for take-off and landing, accountability for wind should be no more than 50 per cent of any reported steady headwind component of 5 knots or more. Where take-off and landing with a tailwind component is permitted in the flight manual, not less than 150 per cent of any reported tailwind component should be allowed. Where precise wind measuring equipment enables accurate measurement of wind velocity over the point of take-off and landing, these values may be varied.

2.3 Operating conditions

2.3.1 For helicopters operating in performance Class 2 or 3 in any flight phase where an engine failure may cause the helicopter to force-land:

a) a minimum visibility should be defined by the operator, taking into account the characteristics of the helicopter, but should not be less than 800m and

b) the operator should verify that the surface below the intended flight path permits the pilot to execute a safe forced landing.

2.3.2 Performance Class 3 operations are not to be performed:

a) out of the sight of the surface; or

b) at night; or

c) when the cloud ceiling is less than 180 m (600 ft).

Note - The text of 2.3 contains an interpretation of the principle of "appropriate consideration" for a safe forced landing (contained in Section II, Chapter 3, 3.1.2). For States which take advantage of Section II, Chapter 3, 3.4, or which have risk assessed exposure and/or permitted night VFR operations, 2.3 should be replaced with an appropriately constructed alternative text.

2.4 Obstacle accountability area

2.4.1 For the purpose of the obstacle clearance requirements in 4 below, an obstacle should be considered if its lateral distance from the nearest point on the surface below the intended flight path is not further than:

a) for VFR operations:

1) half of the minimum width of the FATO (or the equivalent term used in the helicopter flight manual) defined in the helicopter flight manual (or when no width is defined, 0.75 D), plus 0.25 times D (or 3 m, whichever is greater), plus:

- 0.10 DR for VFR day operations

- 0.15 DR for VFR night operations

b) for IFR operations:

1) 1.5 D (or 30 m, whichever is greater), plus:

- 0.10 DR for IFR operations with accurate course guidance

- 0.15 DR for IFR operations with standard course guidance

- 0.30 DR for IFR operations without course guidance

c) for operations with initial take-off conducted visually and converted to IFR/IMC at a transition point, the criteria required in 2.4.1 a) apply up to the transition point then the criteria required in 2.4.1 b) apply after the transition point.

2.4.2 For a take-off using a backup take-off procedure (or with lateral transition), for the purpose of the obstacle clearance requirements in 4 below, an obstacle located below the backup flight path (lateral flight path) should be considered if its lateral distance from the nearest point on the surface below the intended flight path is not further than half of the minimum width of the FATO (or the equivalent term used in the helicopter flight manual) defined in the helicopter flight manual (when no width is defined, 0.75 D plus 0.25 times D, or 3 m, whichever is greater) plus:

a) 0.10 distance travelled from the back edge of the FATO for VFR day operations;

b) 0.15 distance travelled from the back edge of the FATO for VFR night operations.

2.4.3 Obstacles may be disregarded if they are situated beyond:

a) 7 R for day operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb;

b) 10 R for night operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb;

c) 300m if navigational accuracy can be achieved by appropriate navigation aids; and

d) 900m in the other cases.

Note - Standard course guidance includes ADF and VOR guidance. Accurate course guidance includes ILS, MLS, or other course guidance providing an equivalent navigational accuracy.

2.4.4 The transition point should not be located before the end of TODRH for helicopters operating in performance Class 1 and before the DPATO for helicopters operating in performance Class 2.

2.4.5 When considering the missed approach flight path, the divergence of the obstacle accountability area should only apply after the end of the take-off distance available.

2.5 Source of performance data

The operator should ensure that the approved performance data contained in the helicopter flight manual is used to determine compliance with this Example, supplemented as necessary with other data acceptable to the CAAM.

3 Operating Area Considerations

3.1 FATO

For operations in performance Class 1, the dimensions of the FATO should be at least equal to the dimensions specified in the helicopter flight manual.

Note.- A FATO that is smaller than the dimensions specified in the helicopter flight manual may be accepted if the helicopter is capable of a hover out of ground effect with one engine inoperative (HOGE OEI), and the conditions of 4.1 below can be met.

4 Limitations Resulting from Performance

4.1 Operations in performance Class 1

4.1.1 Take-off

4.1.1.1 The take-off mass of the helicopter should not exceed the maximum take-off mass specified in the flight manual for the procedure to be used and to achieve a rate of climb of 100 ft/min at 60m (200ft) and 150ft/min at 300m (1000ft) above the level of the heliport with the critical engine inoperative and the remaining engines operating at an appropriate power rating, taking into account the parameters specified in 2.2 (Figure A-1).

4.1.1.2 Rejected take-off

The take-off mass should be such that the rejected take-off distance required does not exceed the rejected take-off distance available.

4.1.1.3 Take-off distance

The take-off mass should be such that the take-off distance required does not exceed the take-off distance available.

Note 1.- As an alternative, the requirement above may be disregarded provided that the helicopter with the critical engine failure recognised at TDP can, when continuing the take-off, clear all obstacles from the end of the take-off distance available to the end of the take-off distance required by a vertical margin of not less than 10.7m (35ft) (Figure A-2).

Note 2.- For elevated heliports, the airworthiness code provides appropriate clearance from the elevated heliport edge (Figure A-3).

4.1.1.4 Backup procedures (or procedures with lateral transition)

The operator should ensure that, with the critical engine inoperative, all obstacles below the backup flight path (the lateral flight path) are cleared by an adequate margin. Only the obstacles specified in 2.4.2 should be considered.

4.1.2 Take-off flight path

From the end of the take-off distance required with the critical engine inoperative:

4.1.2.1 The take-off mass should be such that the climb path provides a vertical clearance of not less than 10.7m (35ft) for VFR operations and 10.7m (35ft) plus 0.01 DR for IFR operations above all obstacles located in the climb path. Only obstacles as specified in 2.4 should be considered.

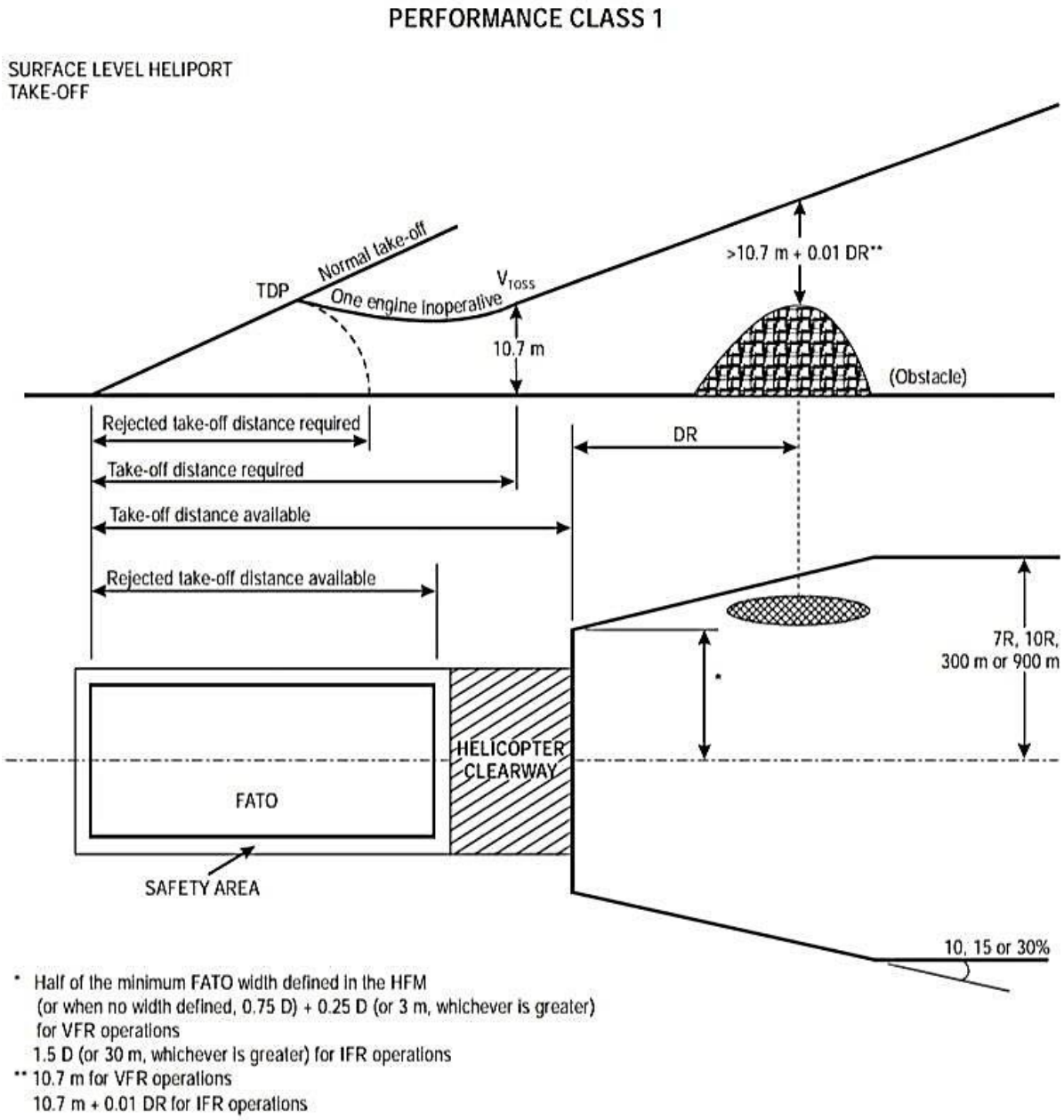

PERFORMANCE CLASS 1
SURFACE LEVEL HELIPORT
TAKE-OFF
TDP
Normal take-off
One engine inoperative
V_{TOSS}
10.7 m
>10.7 m + 0.01 DR**
(Obstacle)
Rejected take-off distance required
Take-off distance required
Take-off distance available
Rejected take-off distance available
DR
7R, 10R,
300 m or 900 m
*
HELICOPTER
CLEARWAY
FATO
SAFETY AREA
10, 15 or 30%
* Half of the minimum FATO width defined in the HFM
(or when no width defined, 0.75 D) + 0.25 D (or 3 m, whichever is greater)
for VFR operations
1.5 D (or 30 m, whichever is greater) for IFR operations
** 10.7 m for VFR operations
10.7 m + 0.01 DR for IFR operations

Figure A-1

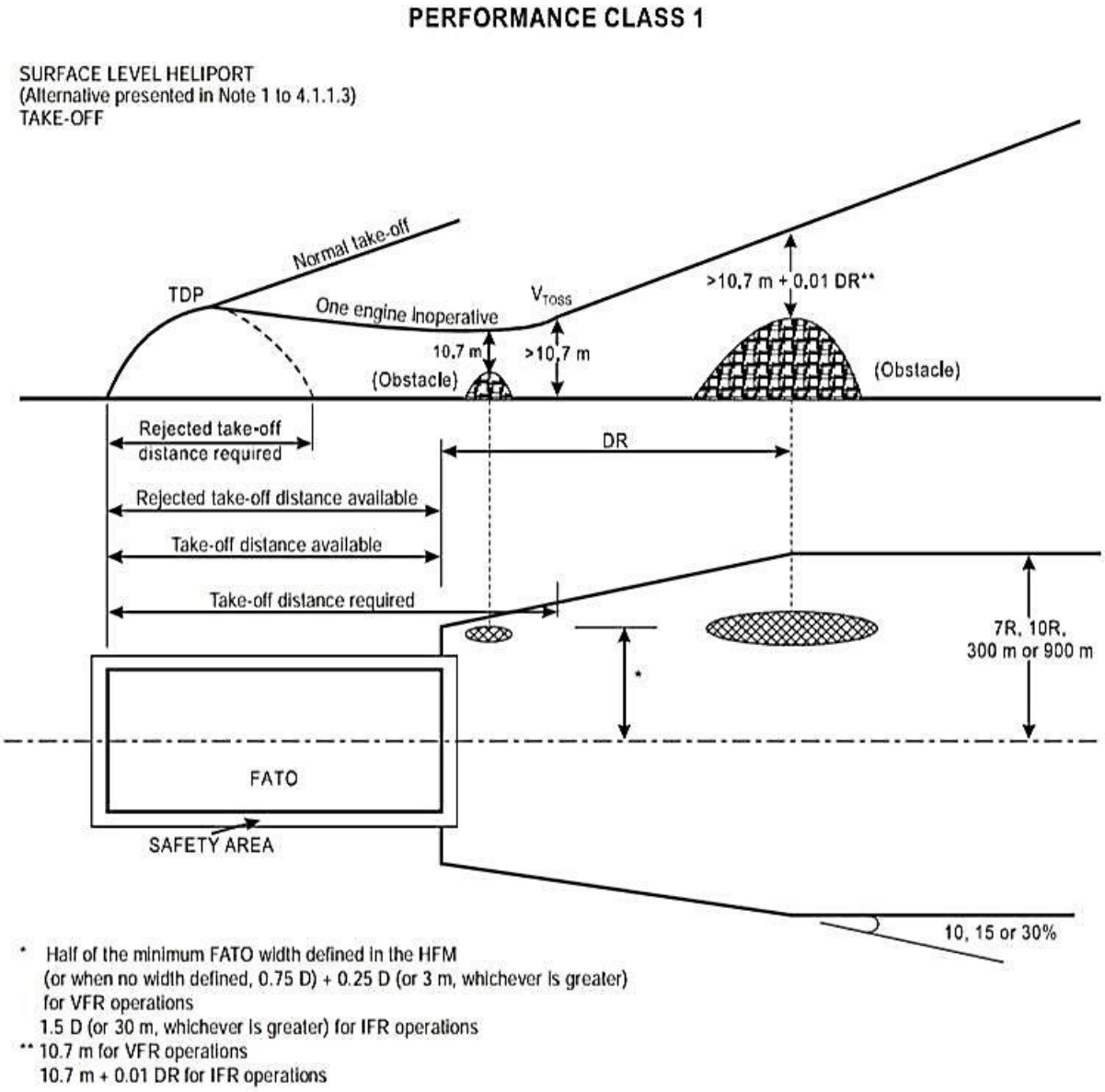

PERFORMANCE CLASS 1
SURFACE LEVEL HELIPORT
(Alternative presented in Note 1 to 4.1.1.3)
TAKE-OFF
Normal take-off
TDP
One engine inoperative
V_{TOSS}
>10.7 m + 0.01 DR**
10.7 m
>10.7 m
(Obstacle)
(Obstacle)
Rejected take-off distance required
DR
Rejected take-off distance available
Take-off distance available
Take-off distance required
7R, 10R, 300 m or 900 m
*
FATO
SAFETY AREA
10, 15 or 30%
* Half of the minimum FATO width defined in the HFM (or when no width defined, 0.75 D) + 0.25 D (or 3 m, whichever is greater) for VFR operations
1.5 D (or 30 m, whichever is greater) for IFR operations
** 10.7 m for VFR operations
10.7 m + 0.01 DR for IFR operations

Figure A-2

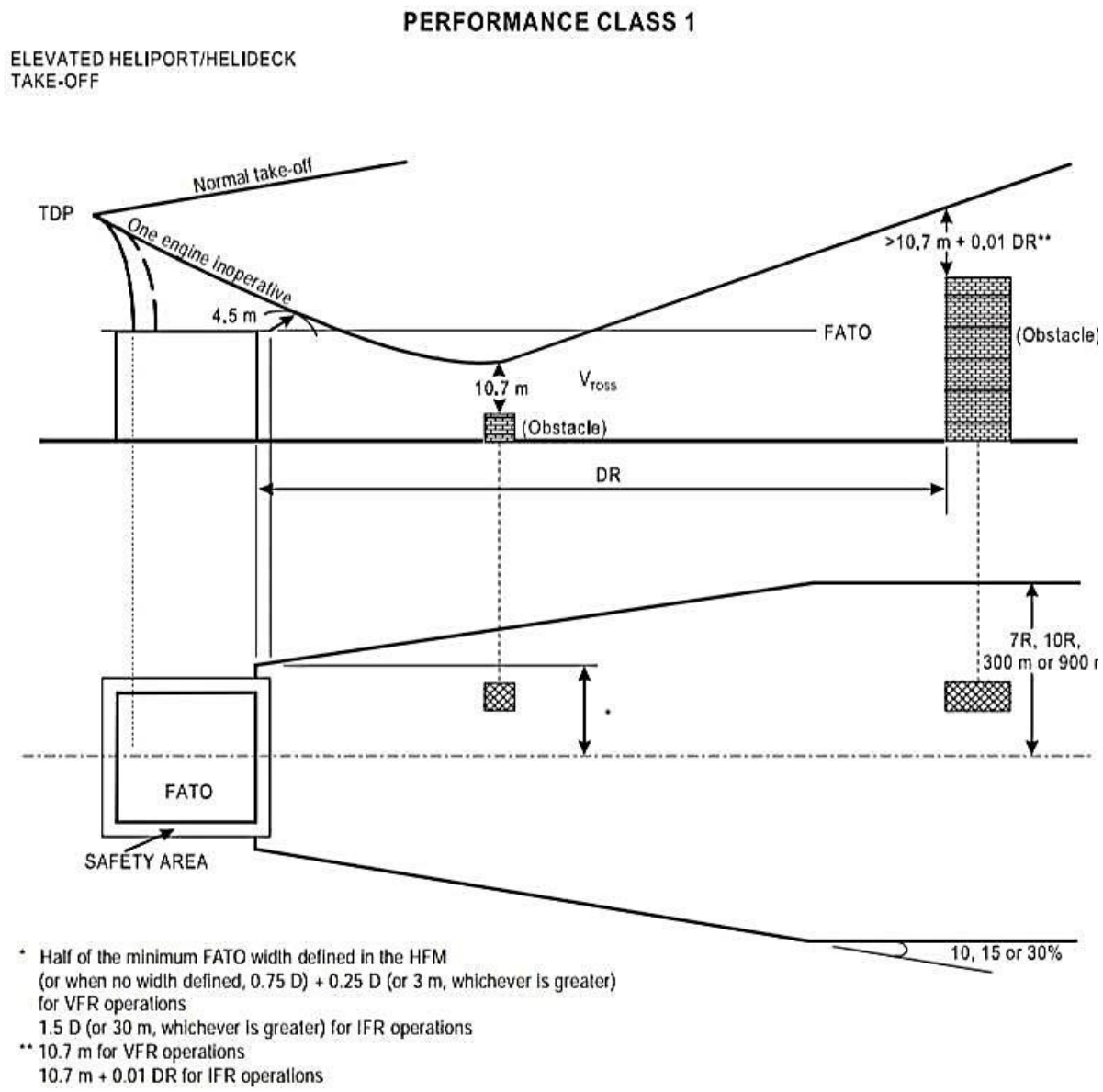


Figure A-3

4.1.2.2 Where a change of direction of more than 15 degrees is made, obstacle clearance requirements should be increased by 5m (15ft) from the point at which the turn is initiated. This turn should not be initiated before reaching a height of 60m (200ft) above the take-off surface, unless permitted as part of an approved procedure in the flight manual.

4.1.3 *En route*

The take-off mass is such that it is possible, in case of the critical engine failure occurring at any point of the flight path, to continue the flight to an appropriate landing site and achieve the minimum flight altitudes for the route to be flown.

4.1.4 Approach, landing and balked landing (Figures A-4 and A-5)

The estimated landing mass at the destination or alternate should be such that:

a) it does not exceed the maximum landing mass specified in the flight manual for the procedure to be used and to achieve a rate of climb of 100ft/min at 60m (200ft) and

150ft/min at 300m (1000ft) above the level of the heliport with the critical engine inoperative and the remaining engines operating at an appropriate power rating, taking into account the parameters specified in 2.2;

b) the landing distance required does not exceed the landing distance available unless the helicopter, with the critical engine failure recognised at LDP can, when landing, clear all obstacles in the approach path;

c) in case of the critical engine failure occurring at any point after the LDP, it is possible to land and stop within the FATO; and

d) in the event of the critical engine failure being recognised at the LDP or at any point before the LDP, it is possible either to land and stop within the FATO or to overshoot, meeting the conditions of 4.1.2.1 and 4.1.2.2.

Note - For elevated heliports, the airworthiness code provides appropriate clearance from the elevated heliport edge.

4.2 Operations in performance Class 2

4.2.1 Take-off (Figures A-6 and A-7)

The mass of the helicopter at take-off should not exceed the maximum take-off mass specified in the flight manual for the procedures to be used and to achieve a rate of climb of 150ft/min at 30m (1000ft) above the level of the heliport with the critical engine inoperative and the remaining engines operating at an appropriate power rating, taking into account the parameters specified in 2.2.

4.2.2 Take-off flight path

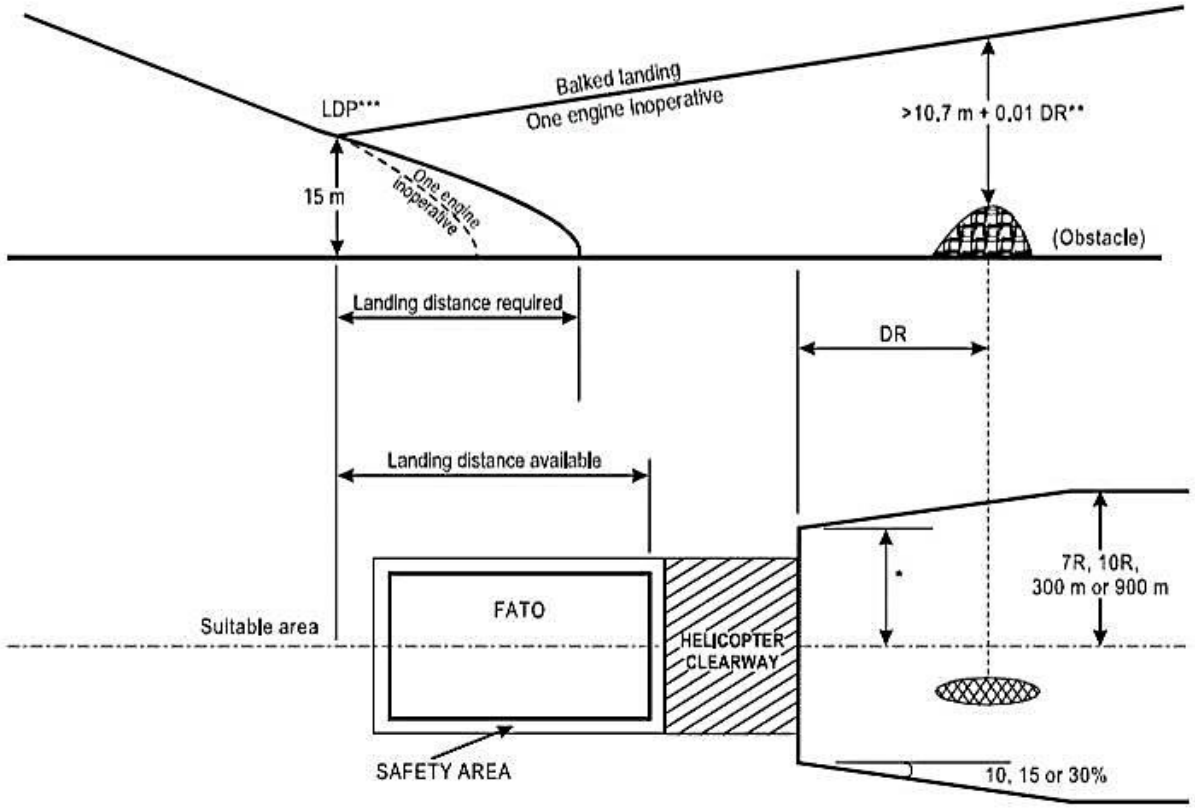
From DPATO or, as an alternative, no later than 60m (200ft) above the take-off surface with the critical engine inoperative, the conditions of 4.1.2.1 and 4.1.2.2 should be met.

4.2.3 En route

The requirements of 4.1.3 should be met.

PERFORMANCE CLASS 1

SURFACE LEVEL HELIPORT
LANDING



* Half of the minimum FATO width defined in the HFM (or when no width defined, 0.75 D) + 0.25 D
(or 3 m, whichever is greater) for VFR operations
1.5 D (or 30 m, whichever is greater) for IFR operations

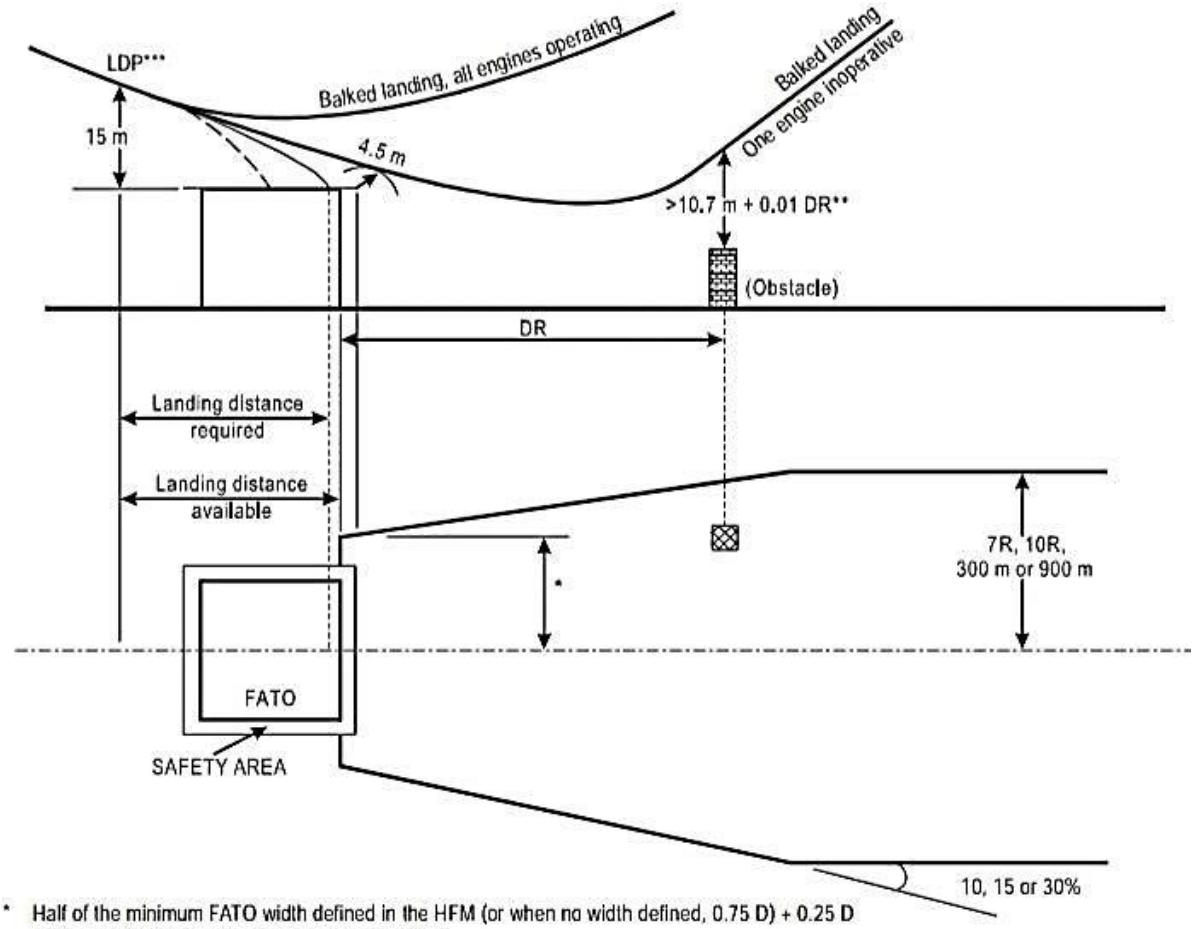
** 10.7 m for VFR operations
10.7 m + 0.01 DR for IFR operations

*** For the purposes of the diagram, all paths and distances emanate from 50 ft (15 m).
The actual height of this point and position of the LDP should be obtained from the HFM.

Figure A-4

PERFORMANCE CLASS 1

ELEVATED HELIPORT/HELIDECK
LANDING

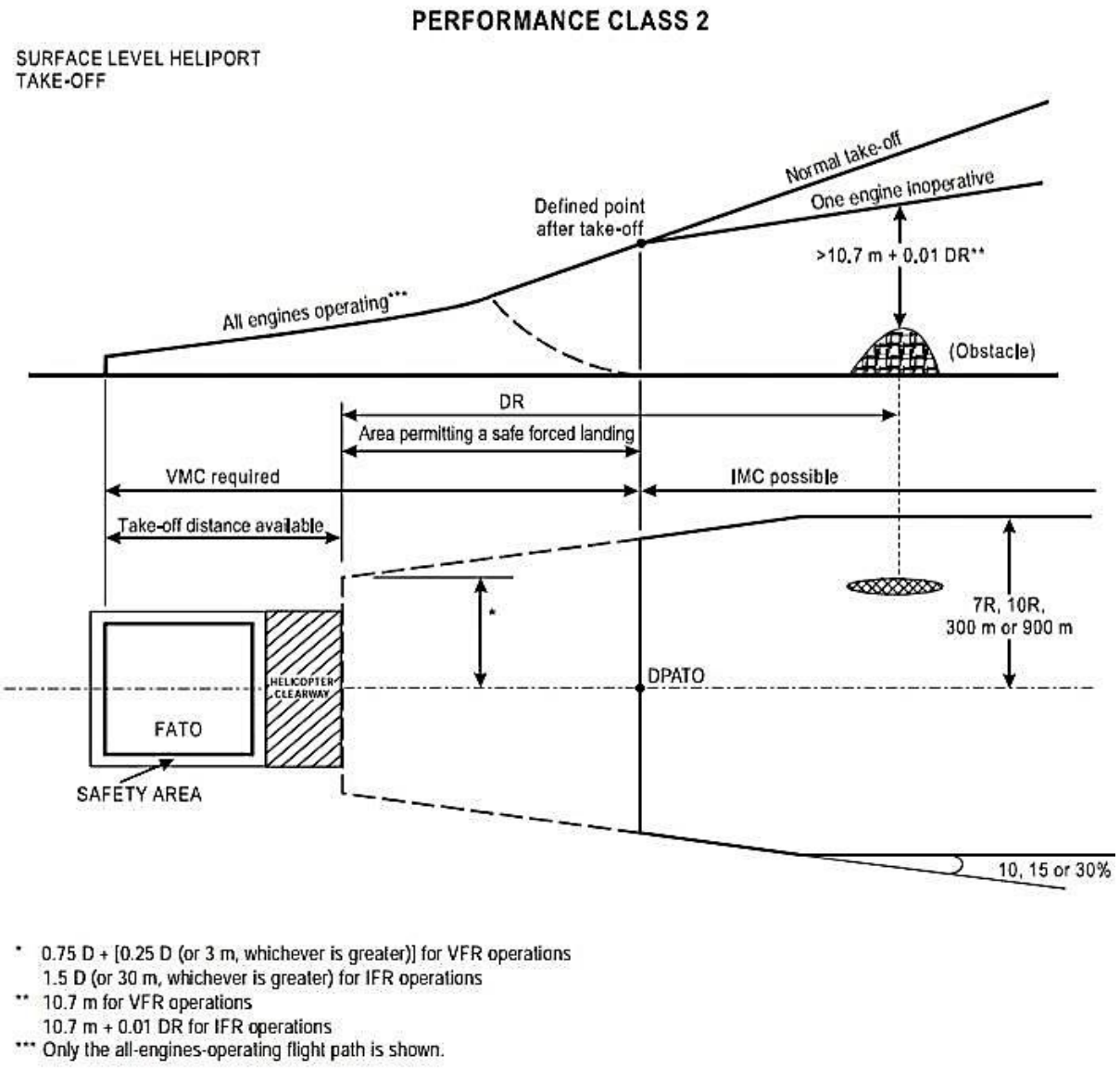


* Half of the minimum FATO width defined in the HFM (or when no width defined, 0.75 D) + 0.25 D
(or 3 m, whichever is greater) for VFR operations
1.5 D (or 30 m, whichever is greater) for IFR operations

** 10.7 m for VFR operations
10.7 m + 0.01 DR for IFR operations

*** For the purposes of the diagram, all paths and distances emanate from 50 ft (15 m).
The actual height of this point and position of the LDP should be obtained from the HFM.

Figure A-5

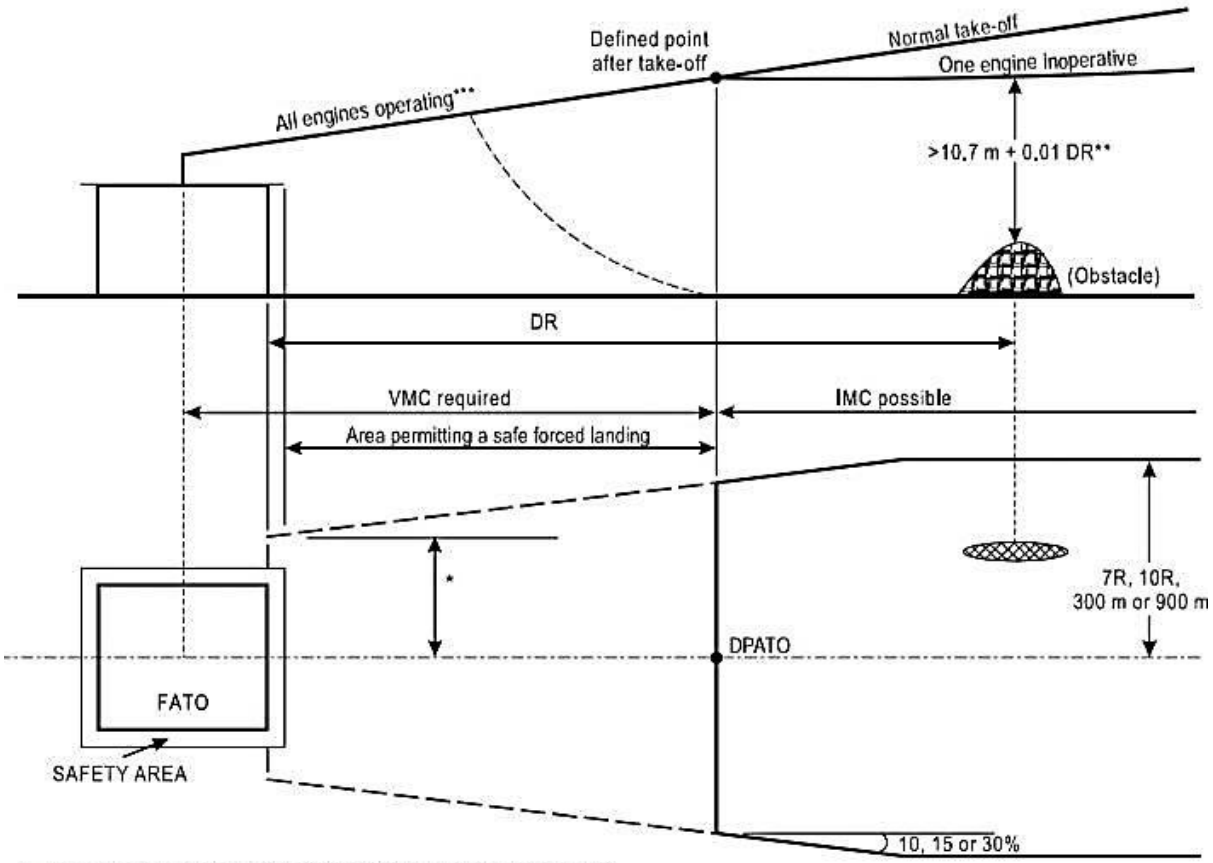


* 0.75 D + [0.25 D (or 3 m, whichever is greater)] for VFR operations
1.5 D (or 30 m, whichever is greater) for IFR operations
** 10.7 m for VFR operations
10.7 m + 0.01 DR for IFR operations
*** Only the all-engines-operating flight path is shown.

Figure A-6

PERFORMANCE CLASS 2

ELEVATED HELIPORT/HELIDECK
TAKE-OFF



* 0.75 D + [0.25 D (or 3 m, whichever is greater)] for VFR operations
1.5 D (or 30 m, whichever is greater) for IFR operations
** 10.7 m for VFR operations
10.7 m + 0.01 DR for IFR operations
*** Only the all-engines-operating flight path is shown.

Figure A-7

4.2.4 Approach, landing and balked landing (Figures A-8 and A-9)

The estimated landing mass at the destination or alternate should be such that:

a) it does not exceed the maximum landing mass specified in the flight manual for a rate of climb of 150ft/min at 300m (1000ft) above the level of the heliport with the critical engine inoperative and the remaining engines operating at an appropriate power rating, taking into account the parameters specified in 2.2;

b) it is possible, in case of the critical engine failure occurring at or before the DPBL, either to perform a safe forced landing or to overshoot, meeting the requirements of 4.1.2.1 and 4.1.2.2.

Only obstacles as specified in 2.4 should be considered.

4.3 Operations in performance Class 3

4.3.1 Take-off

The mass of the helicopter at take-off should not exceed the maximum take-off mass specified in the flight manual for a hover in ground effect with all engines operating at take-off power, taking into account the parameters specified in 2.2. If conditions are such that a hover in ground effect is not likely to be established, the take-off mass should not exceed the maximum mass specified for a hover out of ground effect with all engines operating at take-off power, taking into account the parameters specified in 2.2.

4.3.2 Initial climb

The take-off mass should be such that the climb path provides adequate vertical clearance above all obstacles located along the climb path, all engines operating.

4.3.3 En route

The take-off mass is such that it is possible to achieve the minimum flight altitudes for the route to be flown, all engines operating.

4.3.4 Approach and landing

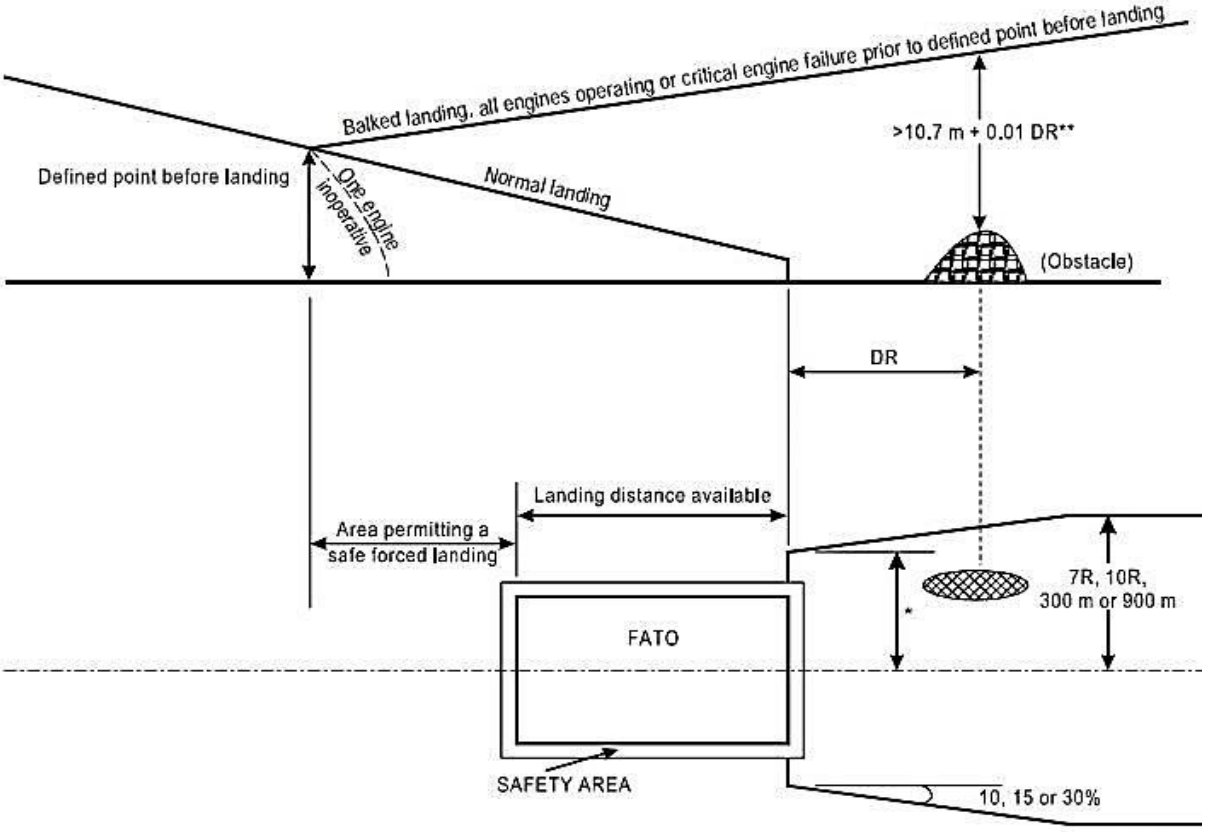
The estimated landing mass at the destination or alternate should be such that:

a) it does not exceed the maximum landing mass specified in the flight manual for a hover in ground effect with all engines operating at take-off power, taking into account the parameters specified in 2.2. If conditions are such that a hover in ground effect is not likely to be established, the take-off mass should not exceed the maximum mass specified for a hover out of ground effect with all engines operating at take-off power, taking into account the parameters specified in 2.2;

b) it is possible to perform a balked landing, all engines operating, at any point of the flight path and clear all obstacles by an adequate vertical interval.

PERFORMANCE CLASS 2

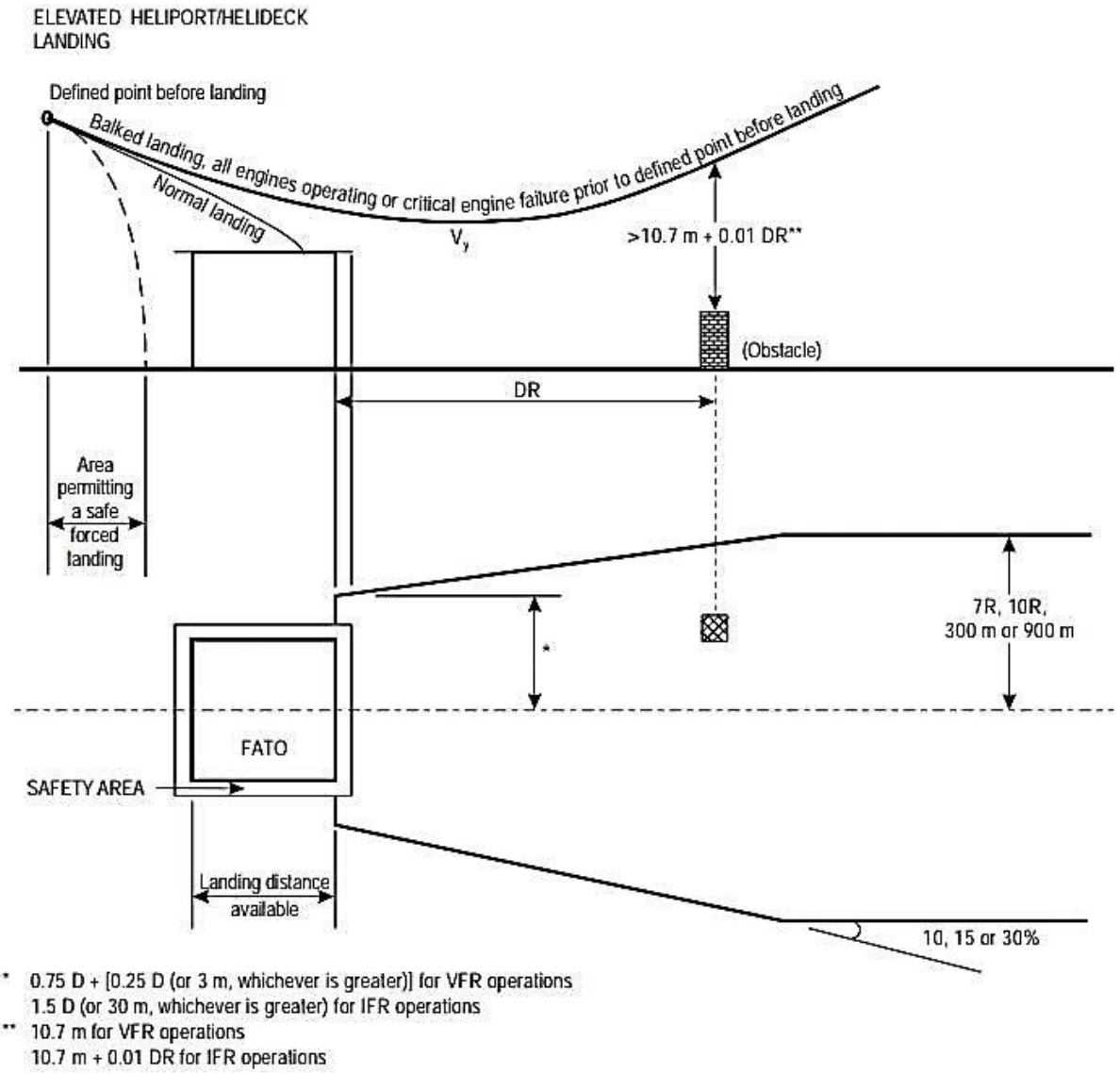
SURFACE LEVEL HELIPORT
LANDING



* 0.75 D + [0.25 D (or 3 m, whichever is greater)] for VFR operations
1.5 D (or 30 m, whichever is greater) for IFR operations
** 10.7 m for VFR operations
10.7 m + 0.01 DR for IFR operations

Figure A-8

PERFORMANCE CLASS 2



* 0.75 D + [0.25 D (or 3 m, whichever is greater)] for VFR operations
1.5 D (or 30 m, whichever is greater) for IFR operations
** 10.7 m for VFR operations
10.7 m + 0.01 DR for IFR operations

Figure A-9

Attachment B - Medical Supplies

Note. – (Supplementary to Section II, Chapter 4, 4.2.2 a)

First-aid kit

The following provides guidance 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 7.5cm × 4.5m

— Bandage: triangular; safety pins

— Dressing: burn 10cm × 10cm

— Dressing: compress, sterile 7.5cm × 12cm

— Dressing: gauze, sterile 10.4cm × 10.4cm

— Tape: adhesive 2.5cm (roll)

— Steri-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 1.2cm × 4.6m

— 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 should 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 faeces 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

Attachment C - Minimum Equipment List (MEL)

Note. – (Supplementary to Section II, Chapter 4, 4.1.3)

1 If deviations from the requirements of CAAM in the certification of aircraft were not permitted an aircraft could not be flown unless all systems and equipment were operable. Experience has proved that some unserviceability can be accepted in the short term when the remaining operative systems and equipment provide for continued safe operations.

2 The operator, through approval by the CAAM of a minimum equipment list those systems and items of equipment that may be inoperative for certain flight conditions with the intent that no flight can be conducted with inoperative systems and equipment other than those specified.

3 A minimum equipment list, approved by the CAAM, is therefore necessary for each aircraft, based on the master minimum equipment list established for the aircraft type by the organisation responsible for the type design in conjunction with the manufacture.

4 A minimum equipment list designed to allow the operation of an aircraft with certain systems or equipment inoperative provided an acceptable level of safety is maintained shall be prepared by the operator and approved by the CAAM.

5 The minimum equipment list is not intended to provide for operation of the aircraft for an indefinite period with inoperative systems or equipment. The basic purpose of the minimum equipment list is to permit the safe operation of an aircraft with inoperative systems or equipment within the framework of a controlled and sound programme of repairs and parts replacement.

6 Operators are to ensure that no flight is commenced with multiple minimum equipment list items inoperative without determining that any interrelationship between inoperative systems or components will not result in an unacceptable degradation in the level of safety and/or undue increase in the flight crew workload.

7 The exposure to additional failures during continued operation with inoperative systems or equipment must also be considered in determining that an acceptable level of safety is being maintained. The minimum equipment list may not deviate from requirements of the flight manual limitations section, emergency procedures or other airworthiness requirements by the CAAM unless the other appropriate airworthiness authority or the flight manual provides otherwise.

8 Systems or equipment accepted as inoperative for a flight should be placarded where appropriate and all such items should be noted in the aircraft technical log to inform the flight crew and maintenance personnel of the inoperative system or equipment.

9 For a particular system or item of equipment to be accepted as inoperative, it may be necessary to establish a maintenance procedure, for completion prior to flight, to deactivate or isolate the system or equipment. It may similarly be necessary to prepare an appropriate flight crew operating procedure.

10 The responsibilities of the pilot-in-command in accepting a helicopter for operation with deficiencies in accordance with a minimum equipment list are specified in Section II, Chapter 2, 2.3.1

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Attachment D - Air Operator Certification and Validation

Note. – (Supplementary to Section II, Chapter 2, 2.2.1)

1 Purpose and Scope

1.1 Introduction

The AOC and its associated model specific operations specifications shall contain the minimum information required in Chapter 2, 2.2.1 and CAD 6004 respectively, in a standardised format.

1.2 Prior certification required

The issuance of an air operator certificate (AOC) is “dependent upon the operator demonstrating” to the CAAM that its organisation, training, flight operations and maintenance arrangements are adequate considering the nature and extent of the operations to be conducted. The certification process involves the CAAM’s evaluation of each operator and a determination that the operator is capable of conducting safe operations before initial issuance of an AOC or the addition of any subsequent authorisations to an AOC.

1.3 Standard certification practices

RESERVED

2 Required technical safety evaluations

2.1 Approval and acceptance actions

2.1.1 The certification and continued surveillance of an air operator includes actions taken by the CAAM on matters submitted for its review. The actions can be categorised as approvals or acceptances depending on the nature of the response by CAAM to the matter submitted for its review.

2.1.2 An approval is an active response by the CAAM to a matter submitted for its review. An approval constitutes a finding or determination of compliance with the applicable standards. An approval will be evidenced by the signature of the approving official, the issuance of a document or certificate, or some other formal action taken by the CAAM.

2.1.3 An acceptance does not necessarily require an active response by the CAAM to a matter submitted for its review. The CAAM may accept a matter submitted to it for review as being in compliance with the applicable standards if the CAAM does not specifically reject all or a portion of the matter under review, usually after some defined period of time after submission.

2.1.4 The phrase “approved by the CAAM” or similar phrases using the word “approval” are frequently used in CAD 6, Part 3. Provisions indicating a review and implying approval or at least “acceptance” by the CAAM occur even more frequently in Part 3. In addition to these specific phrases, Part 3, contains numerous references to requirements which would, as a minimum, create the need for at least a technical review by CAAM. This Attachment groups and outlines those specific Standards and Recommended Practices for ease of use by the CAAM.

2.1.5 The CAAM will make or arrange for a technical safety evaluation before issuing the approval or acceptance. The evaluation should:

a) be accomplished by a person with specific qualifications to make such a technical evaluation;

b) be in accordance with written, standardised methodology; and

c) where necessary to safety, include a practical demonstration of the air operator's actual ability to conduct such an operation.

2.2 Demonstrations necessary prior to some approvals

2.2.1 Standard 2.2.1.3 obligates the CAAM, prior to certification of the operator, to require sufficient demonstrations by the operator to enable the CAAM to evaluate the adequacy of the operator's organisation, method of control and supervision of flight operations, ground handling and maintenance arrangements. These demonstrations should be in addition to the review or inspections of manuals, records, facilities and equipment. Some of the approvals required by Part 3, such as approval for Category III operations, have significant safety implications and should be validated by demonstration(s) before the CAAM approves such operations.

2.2.2 While the specific methodology and extent of the required demonstrations and evaluations vary between States, the certification processes of the CAAM whose operators have good safety records are generally consistent. In these certifying processes, technically qualified inspectors evaluate a representative sample of the actual training, maintenance and operations prior to the issuance of an AOC or additional authorisations to the AOC.

2.3 Recording of certification actions

2.3.1 It is important that the certification, approval and acceptance actions of the CAAM are adequately documented. Thel issue a written instrument, such as a letter or formal document by the CAAM, as an official record of the action. These written instruments should be retained as long as the operator continues to exercise the authorisations for which the approval or acceptance action was issued. These instruments are unambiguous evidence of the authorities held by the operator and provide proof in the event that the CAAM and the operator disagree on the operations that the operator is authorised to conduct.

2.3.2 The CAAM will collect certification records such as inspections, demonstrations, approvals and acceptance instruments into a single file which is retained as long as the operator is active. These certification records are persuasive evidence that the CAAM is complying with its ICAO obligations regarding operator certification.

2.4 Coordination of operations and airworthiness evaluations

Some of the references to approval or acceptance in Part 3, will require an operations evaluation and an airworthiness evaluation. Low minima approvals for the conduct of Category II and III ILS approaches, for example, require coordinated prior evaluation by operations and airworthiness specialists. Flight operations specialists should evaluate the operational procedures, training and qualifications. Airworthiness specialists should evaluate the aircraft, equipment reliability and maintenance procedures. These evaluations may be accomplished separately, but should be coordinated to ensure that all aspects necessary for safety have been addressed before any approval is issued.

Note.- Guidance concerning the responsibilities of the State of the Operator and the State of Registry in connection with lease, charter and interchange operations is contained in the Manual of Procedures for Operations Inspection, Certification and Continued

Surveillance (ICAO Doc 8335). Guidance concerning the transfer of State of Registry responsibilities to the State of the Operator in accordance with Article 83 bis is contained in Guidance on the Implementation of Article 83 bis of the Convention on International Civil Aviation (Cir 295).

3 Approval Actions

3.1 Approvals

The term “approval” implies a more formal action on the part of the CAAM with respect to a certification matter than does the term “acceptance”. The CAAM allows for a variety of documents to be issued as evidence of an approval. The approval document issued and the matter addressed by the approval will depend on the delegated authority of the official. In the case of the CAAM, authority to sign routine approvals, such as operator minimum equipment lists for specific aircraft, is delegated to technical inspectors. More complex or significant approvals are normally issued by higher level officials.

3.2 Air operator certificate (AOC)

3.2.1 The AOC required by Chapter 2, 2.2.1, is a formal instrument. CAD 6004 lists the information to be included in the AOC.

3.2.2 Operations specifications may include other specific authorisations, such as:

a) take-off and landing operations with exposure time;

b) special approach procedures (e.g. steep gradient approach, instrument landing system precision runway monitor approach, localizer-type directional aid precision runway monitor approach, RNP approach);

c) instrument meteorological conditions operations in Performance Class III; and

d) operations in areas with special procedures (e.g. operations in areas using different altimetry units or altimeter setting procedures).

3.3 Provisions that require an approval

The following provisions requires approval by the CAAM. The approval of the CAAM is required in all of the certification actions listed below that are not preceded by one or more asterisks. Certification actions listed below that are preceded by one or more asterisks require approval by the State of Registry (single asterisk or “*”), or by the State of Design (double asterisk or “**”).

a) **Configuration deviation list (CDL) (Definitions);

b) **Master minimum equipment list (MMEL) (Definitions);

c) The method for establishing minimum flight altitudes (2.2.7.3);

d) The method of determining heliport operating minima (2.2.8.1);

e) Flight time, flight duty periods and rest periods (2.2.10.2);

f) Helicopter-specific minimum equipment list (MEL) (4.1.3);

g) RNP Performance-based navigation operations (5.2.2 b));

h) *Approved maintenance organisation (6.1.2);

i) *Helicopter-specific maintenance programme (6.3.1);

j) Flight crew training programmes (7.3.1);

k) Training in the transport of dangerous goods (7.3.1, Note 5);

l) Use of flight simulation training devices (7.3.2 a), 7.4.2 and 7.4.4.1, Note);

m) Method of control and supervision of flight operations (2.2.1.3 and 8.1);

n) **Mandatory maintenance tasks and intervals (9.3.2); and

o) Cabin attendant training programmes (10.3).

3.4 Provisions that require a technical evaluation

Other provisions of Part 3, require the CAAM to have made a technical evaluation. These provisions contain the phrases “acceptable to the CAAM”, “satisfactory to the CAAM”, “determined by the CAAM”, “deemed acceptable by the CAAM”, and “prescribed by the CAAM”. While not necessarily requiring an approval by CAAM, these Standards do require the CAAM to at least accept the matter at issue after it conducts a specific review or evaluation. These provisions are:

a) details of the helicopter-specific checklists (Definition: aircraft operating manual and 4.1.4);

b) Details of the aircraft-specific systems (Definition: aircraft operating manual and 4.1.4);

c) mandatory material for the operations manual (2.2.3.2 and Appendix 8);

d) *operator's aircraft-specific maintenance responsibilities (6.1.1);

e) *method of maintenance and release (6.1.2);

f) *maintenance control manual (6.2.1);

g) *mandatory material for the maintenance control manual (6.2.4);

h) *reporting of maintenance experience information (6.5.1);

i) *implementing necessary maintenance corrective actions (6.5.2);

j) *modification and repair requirements (6.6);

k) training facilities (7.3.1);

l) qualifications of instructors (7.3.1);

m) need for recurrent training (7.3.l);

n) use of correspondence courses and written examinations (7.3.1, Note 4);

o) use of flight simulation training devices (7.3.2);

p) flight crew qualification records (7.4.3.4);

q) designated representative of the State of the Operator (7.4.4.1);

r) *flight manual changes (9.1); and

s) minimum number of flight attendants assigned to a specific aircraft (10.1).

4 Acceptance Actions

4.1 Acceptance

4.1.1 The actual extent of the CAAM's technical evaluation of the operator's readiness to conduct certain flight operations should be much broader than just those Standards which require or imply approval. During certification, the operator will be in compliance and overseen by the CAAM with all requirements of Part 3, prior to conducting commercial air transport operations.

4.1.2 The concept of "acceptance" is used by CAAM as a formal method of ensuring that all critical aspects of operator certification are reviewed by CAAM prior to the formal issuance of the AOC. Using this concept, the CAAM exercise it's prerogative to have technical inspectors review all operators' policies and procedures impacting operational safety. The actual execution of an instrument to reflect this acceptance (assuming such a document is issued) may be delegated to the technical inspector assigned to the certification.

4.1.3 The act of "acceptance" is in addition to the issuance of a specific approval. For example, certain portions of the operations manual may be "accepted" by formal instrument, while other portions such as the aircraft-specific minimum equipment list are "approved" by a separate formal instrument.

4.2 Conformance report

The CAAM uses a conformance report to document the acceptances it makes with regard to a particular operator. This is a document submitted by the operator detailing how, with specific references to operations or maintenance manuals, it will comply with all applicable Malaysian regulations. This type of document is referenced in ICAO Doc 8335. Such a conformance report should be actively used during the certification process and revised as necessary to reflect modifications required by the CAAM in the operator's policies and procedures. Then a final conformance report is included in the CAAM's certification records, along with other records of certification. The conformance report is an excellent method of demonstrating that the operator was properly certificated with respect to all applicable regulatory requirements.

4.3 Operations and maintenance manuals

4.3.1 Operations and maintenance manuals, and any subsequent amendments should be submitted to the CAAM. The CAAM also establishes minimum contents for these manuals. The pertinent portions of the operator's manual for evaluation should be identified in CAAM's technical guidance, e.g. operations policy manual, aircraft operating manual, cabin crew manual, route guide, and training manual. The CAAM will issue a formal instrument accepting each manual and any subsequent amendments.

4.3.2 The CAAM's technical evaluation should, in addition to ensuring that all required contents are addressed, consider if the specific policies and procedures would result in the desired outcome. For example, the specifications for the operational flight plan should provide the step-by-step completion guidance necessary for compliance with 2.3 concerning the content and retention of these plans.

4.3.3 Proven industry practices, such as an example of an actual completed operational flight plan for reference by the flight crew and dispatchers (although not a Directive), may also be required by the CAAM's technical evaluator during certification. This aspect of the technical evaluation should be conducted by inspectors experienced in operator certification. A major consideration with respect to evaluating for proven industry practices that are aircraft-specific, equipment-specific or have limited

applications is the employment of evaluators who are currently qualified in the practice to be evaluated.

5 Other Approval or Acceptance Considerations

The CAAM may require the approval or acceptance of certain critical documents, records although the relevant CAD 6 Directives do not require approval or acceptance by the CAAM. The following are some examples:

a) method for obtaining aeronautical data;

b) adequacy of the fuel and oil records;

c) adequacy of flight time, flight duty and rest period records;

d) adequacy of the aircraft maintenance logbook;

e) adequacy of the load manifest;

f) adequacy of the operational plan;

g) method for obtaining weather data;

h) method of compliance with carry-on baggage stowage;

i) helicopter performance operating limitations ;

j) method of obtaining and applying heliport obstacle data;

k) adequacy of passenger information cards;

l) procedures for long-range navigation;

m) contents of the journey log book and;

n) content of the security training programme.

6 Validation of Standards of Operations

The Directives in CAD 6004 requires that the validity of an AOC shall depend upon the operator maintaining the original certification standards under the supervision of CAAM. This supervision requires that a system of continued surveillance be established to ensure the required standards of operations are maintained. In maintaining this continued surveillance, it may require annual or semi-annual inspections, observations and tests to validate the required certification approval and acceptance actions.

7 Amendment of Air Operator Certificates

Additional technical evaluations may be required by CAAM before issuing the formal written instruments approving any changes to the original AOC and other authorisations. Where possible, each request should be “bridged”, using the original authorisation as the foundation to determine the extent of CAAM’s impending evaluation before issuing the formal instrument.

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Attachment E - Flight Safety Documents System

Note. – (Supplementary to Section II, Chapter 1, 1.3)

1 Introduction

1.1 The following material provides guidance on the organisation and development of an operator's flight safety documents system. It should be understood that the development of a flight safety documents system is a complete process, and changes to each document comprising the system may affect the entire system. Guidelines applicable to the development of operational documents have been produced by government and industry sources and are available to operators. Nevertheless, it may be difficult for operators to make the best use of these guidelines, since they are distributed across a number of publications.

1.2 Furthermore, guidelines applicable to operational documents development tend to focus on a single aspect of documents design, for example, formatting and typography. Guidelines rarely cover the entire process of operational documents development. It is important for operational documents to be consistent with each other, and consistent with regulations, manufacturer requirements and Human Factors principles. It is also necessary to ensure consistency across departments as well as consistency in application. Hence the emphasis on an integrated approach, based on the notion of the operational documents as a complete system.

1.3 The guidelines in this Attachment address the aspects of the operator's flight safety documents system development process. The guidelines are based not only upon scientific research, but also upon current industry best practices, with an emphasis on a high degree of operational relevance.

2 Organisation

2.1 A flight safety documents system should be organised according to criteria which ensure easy access to information required for flight and ground operations contained in the various operational documents comprising the system and which facilitate management of the distribution and revision of operational documents.

2.2 Information contained in a flight safety documents system should be grouped according to the importance and use of the information, as follows:

a) time-critical information, e.g. information that can jeopardise the safety of the operation if not immediately available;

b) time-sensitive information, e.g. information that can affect the level of safety or delay the operation if not available in a short time period;

c) frequently used information;

d) reference information, e.g. information that is required for the operation but does not fall under b) or c) above; and

e) information that can be grouped based on the phase of operation in which it is used.

2.3 Time-critical information should be placed early and prominently in the flight safety documents system.

2.4 Time-critical information, time-sensitive information, and frequently used information should be placed in cards and quick-reference guides.

3 Validation

The flight safety documents system should be validated before deployment, under realistic conditions. Validation should involve the critical aspects of the information use, in order to verify its effectiveness. Interactions among all groups that can occur during operations should also be included in the validation process.

4 Design

4.1 A flight safety documents system should maintain consistency in terminology and in the use of standard terms for common items and actions.

4.2 Operational documents should include a glossary of terms, acronyms and their standard definition, updated on a regular basis to ensure access to the most recent terminology. All significant terms, acronyms and abbreviations included in the flight documents system should be defined.

4.3 A flight safety documents system should ensure standardisation across document types, including writing style, terminology, use of graphics and symbols, and formatting across documents. This includes a consistent location of specific types of information, consistent use of units of measurement and consistent use of codes.

4.4 A flight safety documents system should include a master index to locate, in a timely manner, information included in more than one operational document.

Note.- The master index must be placed in the front of each document and consist of no more than three levels of indexing. Pages containing abnormal and emergency information must be tabbed for direct access.

4.5 A flight safety documents system should comply with the requirements of the operator's quality system, if applicable.

5 Deployment

Operators should monitor deployment of the flight safety documents system, to ensure appropriate and realistic use of the documents, based on the characteristics of the operational environment and in a way which is both operationally relevant and beneficial to operational personnel. This monitoring should include a formal feedback system for obtaining input from operational personnel.

6 Amendment

6.1 Operators should develop an information gathering, review, distribution and revision control system to process information and data obtained from all sources relevant to the type of operation conducted, including, but not limited to, the CAAM, the State of Registry, manufacturers and equipment vendors.

Note.- Manufacturers provide information for the operation of specific aircraft that emphasises the aircraft systems and procedures under conditions that may not fully match the requirements of operators. Operators should ensure that such information meets their specific needs and those of the local authority.

6.2 Operators should develop an information gathering, review and distribution system to process information resulting from changes that originate within the operator, including:

a) changes resulting from the installation of new equipment;

b) changes in response to operating experience;

c) changes in the operator's policies and procedures;

d) changes in the operator certificate; and

e) changes for purposes of maintaining cross-fleet standardisation.

Note - Operators should ensure that crew coordination philosophy, policies and procedures are specific to their operation.

6.3 A flight safety documents system should be reviewed:

a) on a regular basis (at least once a year);

b) after major events (mergers, acquisitions, rapid growth, downsizing, etc.);

c) after technology changes (introduction of new equipment); and

d) after changes in safety regulations.

6.4 Operators should develop methods of communicating new information. The specific methods should be responsive to the degree of communication urgency.

Note.- As frequent changes diminish the importance of new or modified procedures, it is desirable to minimise changes to the flight safety documents system.

6.5 New information should be reviewed and validated considering its effects on the entire flight safety documents system.

6.6 The method of communicating new information should be complemented by a tracking system to ensure currency by operational personnel. The tracking system should include a procedure to verify that operational personnel have the most recent updates.

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Attachment F - Additional Guidance for Operations of Helicopters in Performance Class 3 In Instrument Meteorological Conditions (IMC)

Note. – (Supplementary to Section II, Chapter 3, 3.4 and Appendix 2)

1 Purpose and scope

The purpose of this attachment is to give additional guidance on the airworthiness and operational requirements described in Section II, Chapter 3, 3.4 and Appendix 2, which have been designed to meet the overall level of safety intended for approved operations in performance Class 3 in IMC.

2 Engine reliability

2.1 The power loss rate required in Chapter 3, 3.4.1 and Appendix 2, paragraph 1 should be established based on data from commercial air transport operations supplemented by suitable data from other operations in similar theatres of operations. Service experience is needed on which to base the judgement, and this should include a number of hours, acceptable to the State of Design, on the actual helicopter/engine combination unless additional testing has been carried out or experience on sufficiently similar variants of the engine is available.

2.2 In assessing engine reliability, evidence should be derived from a world fleet database covering as large a sample as possible of operations considered to be representative, compiled by the appropriate type certificate holders and reviewed by the State of Design. Since flight hour reporting is not mandatory for many types of operators, appropriate statistical estimates may be used to develop the engine reliability data. Data for individual operators approved for these operations including trend monitoring and event reports should also be monitored and reviewed by the CAAM to ensure that there is no indication that the operator's experience is unsatisfactory.

2.2.1 Engine trend monitoring should include the following:

a) an oil consumption monitoring programme based on the manufacturer's recommendations; and

b) an engine condition monitoring programme describing the parameters to be monitored, the method of data collection and the corrective action process; this should be based on the manufacturer's recommendations. The monitoring is intended to detect engine deterioration at an early stage to allow for corrective action before safe operation is affected.

2.2.2 A reliability programme should be established covering the engine and associated systems. The engine programme should include engine hours flown in the period and the power loss rate for all causes established on an appropriate statistical basis. The event reporting process should cover all items relevant to the ability to operate safely in IMC. The data should be available for use by the type certificate holder and the State of Design so as to establish that the intended reliability levels are being achieved. Any sustained adverse trend should result in an immediate evaluation by the operator in consultation with the State(s) of Design and type certificate holders with a view to determining actions to restore the intended safety level.

Note.- The actual period selected should reflect the global utilisation and the relevance of the experience included (e.g. early data may not be relevant due to subsequent mandatory modifications which affected the power loss rate). After the introduction of

a new engine variant and while global utilisation is relatively low, the total available experience may have to be used to try to achieve a statistically meaningful average.

2.3 Power loss rate should be determined as a moving average over an appropriate period. Power loss rate, rather than in-flight shutdown rate, has been used as it is considered to be more appropriate for a helicopter operating in performance Class 3. If a failure occurs on a helicopter operating in performance Class 1 or 2 that causes a major, but not total, loss of power on one engine, it is likely that the engine will be shut down since positive engine-out performance is still available, whereas on a helicopter operating in performance Class 3 it may well be decided to make use of the residual power to stretch the glide distance.

3 Operations manual

The operations manual should include all necessary information relevant to operations by helicopters operating in performance Class 3 in IMC. This should include all of the additional equipment, procedures and training required for such operations, route and/or area of operation and likely landing area (including planning and operating minima).

4 Operator certification or validation

The operator certification or validation process specified by the CAAM should ensure the adequacy of the operator's procedures for normal, abnormal and emergency operations, including actions following engine, systems or equipment failures. In addition to the normal requirements for operator certification or validation, the following items should be addressed in relation to operations by helicopters operating in performance Class 3 in IMC:

a) confirmation of the achieved engine reliability of the helicopter engine combination (see Appendix 2, paragraph 1);

b) specific and appropriate training and checking procedures as described in Appendix 2, paragraph 7;

c) a maintenance programme which is extended to address the equipment and systems referred to in Appendix 2, paragraph 2;

d) an MEL modified to address the equipment and systems necessary for operations in IMC;

e) planning and operating minima appropriate to operations in IMC;

f) departure and arrival procedures and any route/area limitations;

g) pilot qualifications and experience; and

h) the operations manual, including limitations, emergency procedures, routes or areas of operation, the MEL and normal procedures related to the equipment referred to in Appendix 2, paragraph 2.

5 Operational approval and maintenance programme requirements

5.1 Approval to undertake operations by helicopters in performance Class 3 in IMC specified in an air operator certificate or equivalent document should include the particular airframe/engine combinations, including the current type design standard for such operations, the specific helicopters approved, and the areas or routes of such operations.

5.2 The operator's maintenance control manual should include a statement of certification of the additional equipment required, and of the maintenance and reliability programme for such equipment, including the engine.

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Attachment G - Automatic Landing Systems, Head-Up Display (HUD) Or Equivalent Displays and Vision Systems

Note. – (Supplementary to Section II, Chapter 2, 2.2.8.1.1 and Chapter 4, 4.16

Section III, Chapter 2, 2.2.1.1, and Chapter 4, 4.11)

Introduction

The material in this attachment provides guidance for certified automatic landing systems, HUD or equivalent displays and vision systems intended for operational use in helicopters engaged in international air navigation. These systems and hybrid systems may be installed and operated to reduce workload, improve guidance, reduce flight technical error and enhance situational awareness and/or obtain operational credits. Automatic landing systems, HUD or equivalent displays and vision systems may be installed separately or together as part of a hybrid system. Any operational credit for their use by commercial air transport operators requires a specific approval from the CAAM and the State of Registry for general aviation operators.

Note 1.- "Vision systems" is a generic term referring to the existing systems designed to provide images, i.e. enhanced vision systems (EVS), synthetic vision systems (SVS) and combined vision systems (CVS).

Note 2.- "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.

Note 3.- Operational credit can be granted only within the limits of the airworthiness approval.

Note 4.- Currently, operational credit has been given only to vision systems containing an image sensor providing a real-time image of the actual external scene on a HUD.

Note 5.- More detailed information and guidance on automatic landing systems, HUD or equivalent displays and vision systems is contained in the Manual of All-Weather Operations (ICAO Doc 9365.) This manual should be consulted in conjunction with this attachment.

1 HUD and equivalent displays

1.1 General

1.1.1 A HUD presents flight information into the pilot's forward external field of view without significantly restricting that external view.

1.1.2 Flight information should be presented on the HUD or an equivalent display, as required for the intended use.

1.2 Operational applications

1.2.1 Flight operations with a HUD can improve situational awareness by combining flight information located on head-down displays with the external view to provide pilots with more immediate awareness of relevant flight parameters and situation information while they continuously view the external scene. This improved situational awareness can also reduce errors in flight operations and improve the pilot's ability to transition between instrument and visual references as meteorological conditions change.

1.2.2 A HUD may be used to supplement conventional flight deck instrumentation or as a primary flight display if certified for this purpose.

1.2.3 An approved HUD may:

a) qualify for operations with reduced visibility or reduced RVR; or

b) replace some parts of the ground facilities such as touchdown zone and/or centre line lights.

1.2.4 The functions of a HUD may be provided by a suitable equivalent display. However, before such systems can be used, the appropriate airworthiness approval should be obtained.

1.3 HUD training

Training and recent experience requirements for operations using HUD or equivalent displays should, for commercial operators and for general aviation operators be established by CAAM. For commercial air transport operations, the training programmes should be approved by CAAM and the implementation of the training should be subject to oversight by CAAM. The training should address all flight operations for which the HUD or the equivalent display is used.

2 Vision systems

2.1 General

2.1.1 Vision systems can display electronic real-time images of the actual external scene achieved through the use of image sensors, i.e. EVS, or display synthetic images, which are derived from the on-board avionic systems, i.e. SVS. Vision systems can also consist of a combination of these two systems, called combined vision systems, i.e. CVS. Such a system may display electronic real-time images of the external scene using the EVS component of the system. The information from vision systems may be displayed head-up and/or head-down. Operational credit may be granted to vision systems which are appropriately qualified.

2.1.2 Light emitting diode (LED) lights may not be visible to infrared-based vision systems. Operators of such vision systems will need to acquire information about the LED implementation programmes at aerodromes where they intend to operate. More details about the consequences of LED lights are contained in the *Manual of All-Weather Operations* (ICAO Doc 9365).

2.2 Operational applications

2.2.1 Flight operations with EVS allow the pilot to view an image of the external scene obscured by darkness or other visibility restrictions. The use of EVS will also allow acquisition of an image of the external scene earlier than with natural, unaided vision, hence providing for a smoother transition to references by natural vision. The improved acquisition of an image of the external scene may improve situational awareness. It may also qualify for operational credit if the information from the vision system is presented to the pilots in a suitable way and the necessary airworthiness approval and specific approval by the CAAM have been obtained for the combined system.

2.2.2 Vision system imagery may also enable pilots to detect other aircraft on the ground, terrain or obstructions on or adjacent to runways or taxiways.

2.3 Operational concepts

2.3.1 Instrument approach operations include an instrument phase and a visual phase. The instrument phase ends at the published MDA/H or DA/H unless a missed approach is initiated. Using the EVS or CVS does not change the applicable MDA/H or DA/H. The continued approach to landing from MDA/H or DA/H will be conducted using visual references. This also applies to operations with vision systems. The difference is that the visual references will be acquired by use of an EVS or CVS, natural vision or the vision system in combination with natural vision.

2.3.2 Down to a defined height in the visual segment, typically at or above 30m (100ft), the visual references may be acquired solely by means of the vision system. The defined height depends on the airworthiness approval and the specific approval by the CAAM. Below this height the visual references should be solely based on natural vision. In the most advanced applications, the vision system may be used down to touchdown without the requirement for natural vision acquisition of visual references. This means that such a vision system may be the sole means of acquiring visual references and can be used without natural vision.

2.4 Vision systems training

Training and recent experience requirements for commercial operators and for general aviation operators should be established by CAAM. For commercial operators, the training programmes should be approved by CAAM and the implementation of the training should be subject to oversight by CAAM. Training should address all flight operations for which the vision system is used.

2.5 Visual references

2.5.1 In principle, the required visual references do not change due to the use of an EVS or CVS, but those references are allowed to be acquired by means of the vision system until a certain height during the approach as described in 2.3.2 above (see Figure G-1).

2.5.2 Malaysia have yet to develope requirements for operations with vision systems, the use of visual references have been regulated and examples of this are provided in the *Manual of All-Weather Operations* (ICAO Doc 9365).

3 Hybrid systems

A hybrid system generically means that two or more systems are combined. The hybrid system typically has improved performance compared to each of the component systems, which in turn may qualify for operational credit. The inclusion of more systems in the hybrid system normally enhances the performance of the system. The *Manual of All-Weather Operations* (ICAO Doc 9365) contains some examples of hybrid systems.

EVS operations

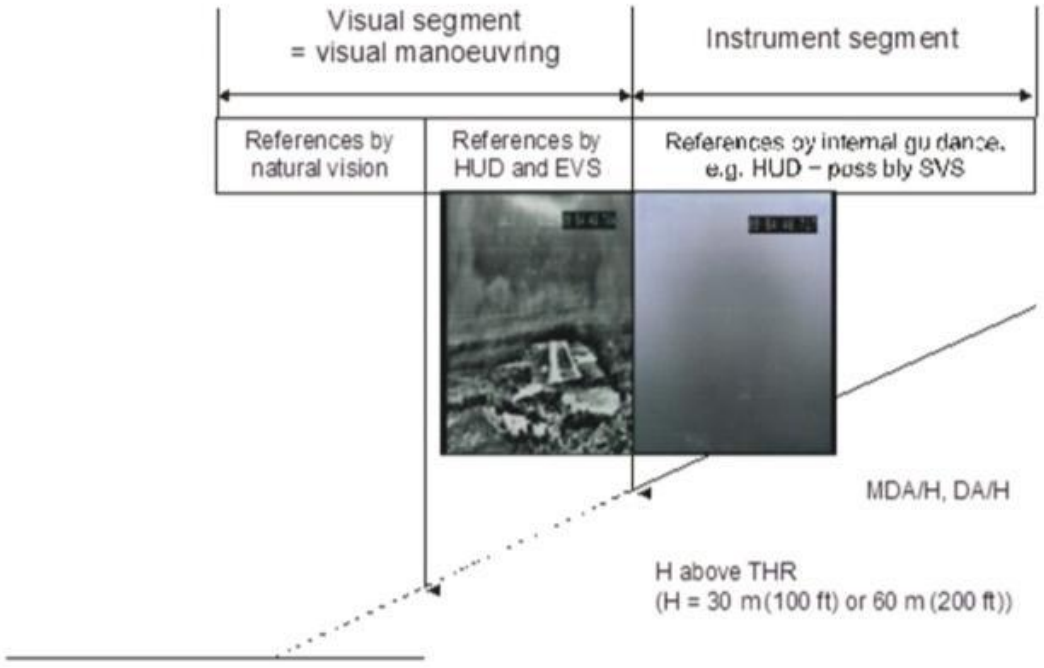

Figure G-1. EVS operations — transition from instrument to visual references

4 Operational credits

4.1 Aerodrome operating minima are expressed in terms of minimum visibility/RVR and MDA/H or DA/H. When aerodrome operating minima are established, the combined capability of the helicopter equipment and on-ground infrastructure should be taken into account. Better equipped helicopters may be able to operate into lower natural visibility conditions, lower DA/H and/or operate with less ground infrastructure. Operational credit means that the aerodrome operating minima may be reduced in case of suitably equipped helicopters. Another way to grant operational credit is to allow visibility requirements to be fulfilled, wholly or partly, by means of the on-board systems. HUD, automatic landing or vision systems, which were not available at the time when the criteria for aerodrome operating minima were originally established.

4.2 The granting of operational credits does not affect the classification (i.e. Type or Category) of an instrument approach procedure since they are designed to support instrument approach operations conducted using helicopters with the minimum equipment prescribed.

4.3 The relation between the procedure design and the operation can be described as follows. The OCA/H is the end product of the procedure design, which does not contain any RVR or visibility values. Based on the OCA/H and all the other elements such as available runway visual aids, the operator will establish MDA/H or DA/H and RVR/visibility, i.e. the aerodrome operating minima. The values derived should not be less than those prescribed by the State of the Aerodrome.

5 Operational procedures

In accordance with Section II, 4.16.2 and Section III, 4.11.2, the operator should develop suitable operational procedures associated with the use of an automatic landing system, a HUD or an equivalent display, vision systems and hybrid systems. The procedures should be included in the operations manual and cover at least the following:

a) limitations;

b) operational credits;

c) flight planning;

d) ground and airborne operations;

e) crew resource management;

f) standard operating procedures; and

g) ATS flight plans and communication.

6 Approvals

6.1 General

Note.- When the application for a specific approval relates to operational credits for systems not including a vision system, the guidance on approvals in this attachment may be used to the extent applicable as determined by CAAM for commercial operators and for general aviation operators.

6.1.1 The operator that wishes to conduct operations with an automatic landing system, a HUD or an equivalent display, a vision system or a hybrid system will need to obtain certain approvals as prescribed in the relevant SARPs. The extent of the approvals will depend on the intended operation and the complexity of the equipment.

6.1.2 Systems that are not used for an operational credit or otherwise critical to the aerodrome operating minima, e.g. vision systems used to enhance situational awareness may be used without a specific approval. However, the standard operating procedures for these systems should be specified in the operations manual or an equivalent document. An example of this type of operation may include an EVS or an SVS on a head-down display that is used only for situational awareness of the surrounding area of the helicopter during ground operations where the display is not in the pilot's primary field of view. For enhanced situational awareness, the installation and operational procedures need to ensure that the operation of the vision system does not interfere with normal procedures or the operation or use of other aircraft systems. In some cases, modifications to these normal procedures for other helicopter systems or equipment may be necessary to ensure compatibility.

6.1.3 The Standard in Section II, 4.16, requires that for commercial air transport operations, the use of an automatic landing system, a HUD or an equivalent display, EVS, SVS or CVS or any combination of those systems into a hybrid system, should be approved when those systems are used "for the safe operation of a helicopter". When operational credits are granted by the CAAM as per the Directive in CAD 6, Part I, 4.2.9.1.1, the use of that system becomes essential for the safety of such operations and is subject to a specific approval. The use of these systems solely for enhanced situational awareness, reduced flight technical error and/or reduced workload is an important safety feature, but does not require a specific approval.

6.1.4 For commercial air transport operations, any operational credit that has been granted should be reflected in the operations specifications for the type or individual helicopter as applicable.

6.1.5 For general aviation operations, the Standard in Section II, 4.11 requires the State of Registry to establish criteria for the use of an automatic landing system, a HUD or an equivalent display, EVS, SVS or CVS or any combination of those systems into a hybrid system for the safe operation of the helicopter and specifies such criteria. When operational credits are granted by CAAM as per the Directive in 2.2.8.1.1, the use of that system becomes essential for the safety of those operations and approval of the use of such systems is part of the operational credit specific approval. The use of these systems solely for enhanced situational awareness, reduced flight technical error and/or reduced workload is an important safety feature, but does not require a specific approval.

6.1.6 For general aviation operations, any operational credit that has been granted should be reflected in the specific approval template and be carried on board the particular helicopter.

6.2 Specific approvals for operational credit

6.2.1 To obtain an approval for operational credit, the operator will need to specify the desired operational credit and submit a suitable application. The content of a suitable application should include:

a) Applicant details. For AOC holders, the company name, AOC number and email address. For other operators, the official name and any business or trading name(s), address, mailing address, email address and contact telephone/fax numbers of the applicant.

b) Aircraft details. Aircraft make(s), model(s) and registration mark(s).

c) Operator's vision system compliance list. The contents of the compliance list are included in the Manual of All-Weather Operations (ICAO Doc 9365). The compliance list should include the information that is relevant to the approval requested and the registration marks of the aircraft involved. If more than one type of aircraft/fleet is included in a single application, a completed compliance list should be included for each aircraft/fleet.

d) Documents to be included with the application. Copies of all documents to which the operator has made references should be included in the application. There should be no need to send complete manuals; only the relevant sections/pages should be required. Additional guidance material can be found in the Manual of All-Weather Operations (ICAO Doc 9365).

e) Name, title and signature.

6.2.2 The following items should be covered in a vision systems compliance list:

a) reference documents used in compiling the submission for approval;

b) flight manual;

c) feedback and reporting of significant problems;

d) requested operational credit and resulting aerodrome operating minima;

e) operations manual (or an equivalent document) entries including MEL (where applicable) and standard operating procedures;

f) safety risk assessment;

g) training programmes; and

h) continuing airworthiness.

Expanded guidance on these items is contained in the Manual of All-Weather Operations (ICAO Doc 9365).

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Attachment H - Guide to Current Flight Recorder Provisions

Note. – (Supplementary to Section II, Chapter 4, 4.3 and Section III, Chapter 4, 4.7)

Introduction

These amendments include an update of the provisions pertaining to flight recorders, recording of digital communications, FDR requirements for new aircraft, revised parameter listings, and two-hour duration CVRs. Through the years, the applicability date and the carriage of flight recorders to be installed, as defined by the SARPs, are quite complex.

The tables below summarise the flight recorders carriage requirements for helicopters.

Table H-1. SARPs for the recording of flight parameters in Section II

<table>
<tr><td rowspan="2">Date</td><td colspan="4">Maximum certificated take-off mass
(MCTOM)</td></tr>
<tr><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></td><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>4.3.1.1.2</td><td>4.3.1.1.3</td><td rowspan="2"></td><td rowspan="2"></td></tr>
<tr><td>2016 ⇒</td><td colspan="2">4.3.1.1.1</td></tr>
<tr><td>2018 ⇒</td><td colspan="2"></td><td>4.3.1.1.4</td><td>4.3.1.1.5</td></tr>
</table>

Table H-2. SARPs for the recording of flight parameters in Section III

Date	Maximum certificated take-off mass (MCTOM)	
	Seating configuration of more than 19 passengers or over 7 000 kg	Over 3 175 kg
	All helicopters first certificate of airworthiness	All helicopters first certificate of airworthiness
1989 ⇒	4.7.1.1.2	4.7.1.1.3
2016 ⇒	4.7.1.1.1	4.7.1.1.1

Table H-3. CVR/CARS installation SARPs in Section II and Section III

Date	Maximum certificated take-off mass (MCTOM)	
	Over 7 000 kg	Over 3 175 kg
	All helicopters	All helicopters first certificate of airworthiness
1987 ⇒	4.3.2.1.1 or 4.7.2.1.1	4.3.2.1.2 or 4.7.2.1.2