Section 2 - Helicopters

GM1 CAT.IDE.H.100(b) Instruments and equipment – general

INSTRUMENTS AND EQUIPMENT THAT DO NOT NEED TO BE APPROVED IN ACCORDANCE WITH REGULATION (EC) NO 748/2012, BUT ARE CARRIED ON A FLIGHT

(a) The provision of this paragraph does not exempt the item of equipment from complying with Regulation (EC) No 748/2012 if the instrument or equipment is installed in the helicopter. In this case, the installation should be approved as required in Regulation (EC) No 748/2012 and should comply with the applicable airworthiness codes as required under that Regulation.

(b) The functionality of non-installed instruments and equipment required by this Subpart that do not need an equipment approval should be checked against recognised industry standards appropriated for the intended purpose. The operator is responsible for ensuring the maintenance of these instruments and equipment.

(c) The failure of additional non-installed instruments or equipment not required by this Part or the airworthiness codes as required under Regulation (EC) No 748/2012 or any applicable airspace requirements should not adversely affect the airworthiness and/or the safe operation of the aircraft. Examples are the following:

(1) instruments supplying additional flight information (e.g. stand-alone Global Positioning System (GPS));

(2) mission dedicated equipment (e.g. radios); and

(3) non-installed passenger entertainment equipment.

GM1 CAT.IDE.H.100(d) Instruments and equipment - general

POSITIONING OF INSTRUMENTS

This requirement implies that whenever a single instrument is required to be installed in a helicopter operated in a multi-crew environment, the instrument needs to be visible from each flight crew station.

AMC1 CAT.IDE.H.125&CAT.IDE.H.130 Operations under VFR by day & Operations under IFR or at night - flight and navigational instruments and associated equipment and

INTEGRATED INSTRUMENTS

(a) Individual equipment requirements may be met by combinations of instruments or by integrated flight systems or by a combination of parameters on electronic displays, provided that the information so available to each required pilot is not less than the required in the applicable operational requirements, and the equivalent safety of the installation has been shown during type certification approval of the helicopter for the intended type of operation.

(b) The means of measuring and indicating slip, helicopter attitude and stabilised helicopter heading may be met by combinations of instruments or by integrated flight director systems, provided that the safeguards against total failure, inherent in the three separate instruments, are retained.

AMC1 CAT.IDE.H.125(a)(1)(i)&CAT.IDE.H.130(a)(1) Operations under VFR by day & Operations under IFR or at night – flight and navigational instruments and associated equipment

MEANS OF MEASURING AND DISPLAYING MAGNETIC HEADING

The means of measuring and displaying magnetic direction should be a magnetic compass or equivalent.

AMC1 CAT.IDE.H.125(a)(1)(ii)&CAT.IDE.H.130(a)(2) Operations under VFR by day & Operations under IFR or at night – flight and navigational instruments and associated equipment

MEANS OF MEASURING AND DISPLAYING THE TIME

An acceptable means of compliance is a clock displaying hours, minutes and seconds, with a sweep-second pointer or digital presentation.

AMC1 CAT.IDE.H.125(a)(1)(iii)&CAT.IDE.H.130(b) Operations under VFR by day & Operations under IFR or at night – flight and navigational instruments and associated equipment

CALIBRATION OF THE MEANS OF MEASURING AND DISPLAYING PRESSURE ALTITUDE

The instrument measuring and displaying pressure altitude should be of a sensitive type calibrated in feet (ft), with a sub-scale setting, calibrated in hectopascals/millibars, adjustable for any barometric pressure likely to be set during flight.

AMC1 CAT.IDE.H.125(a)(1)(iv)&CAT.IDE.H.130(a)(43) Operations under VFR by day& Operations under IFR or at night – flight and navigational instruments and associated equipment

CALIBRATION OF THE INSTRUMENT INDICATING AIRSPEED

The instrument indicating airspeed should be calibrated in knots (kt).

AMC1 CAT.IDE.H.125(a)(1)(vii)&CAT.IDE.H.130(a)(8) Operations under VFR by day & Operations under IFR or at night – flight and navigational instruments and associated equipment

OUTSIDE AIR TEMPERATURE

(a) The means of displaying outside air temperature should be calibrated in degrees Celsius.

(b) The means of displaying outside air temperature may be an air temperature indicator that provides indications that are convertible to outside air temperature.

AMC1 CAT.IDE.H.125(b)&CAT.IDE.H.130(h) Operations under VFR by day &Operations under IFR or at night - flight and navigational instruments and associated equipment and

MULTI-PILOT OPERATIONS - DUPLICATE INSTRUMENTS

Duplicate instruments should include separate displays for each pilot and separate selectors or other associated equipment where appropriate.

AMC1 CAT.IDE.H.125(c)(2)&CAT.IDE.H.130(a)(7) Operations under VFR by day & Operations under IFR or at night – flight and navigational instruments and associated equipment

STABILISED HEADING

Stabilised heading should be achieved for VFR flights by a gyroscopic heading indicator, whereas for IFR flights, this should be achieved through a magnetic gyroscopic heading indicator.

AMC1 CAT.IDE.H.125(d)&CAT.IDE.H.130(d) Operations under VFR by day & Operations under IFR or at night operations – flight and navigational instruments and associated equipment

MEANS OF PREVENTING MALFUNCTION DUE TO CONDENSATION OR ICING

The means of preventing malfunction due to either condensation or icing of the airspeed indicating system should be a heated pitot tube or equivalent.

AMC1 CAT.IDE.H.130(e) Operations under IFR or at night – flight and navigational instruments and associated equipment

MEANS OF INDICATING FAILURE OF THE AIRSPEED INDICATING SYSTEM'S MEANS OF PREVENTING MALFUNCTION DUE TO EITHER CONDENSATION OR ICING

A combined means of indicating failure of the airspeed indicating system's means of preventing malfunction due to either condensation or icing is acceptable provided that it is visible from each flight crew station and that there it is a means to identify the failed heater in systems with two or more sensors.

AMC1 CAT.IDE.H.130(f)(6) Operations under IFR or at night – flight and navigational instruments and associated equipment

ILLUMINATION OF STANDBY MEANS OF MEASURING AND DISPLAYING ATTITUDE

The standby means of measuring and displaying attitude should be illuminated so as to be clearly visible under all conditions of daylight and artificial lighting.

AMC1 CAT.IDE.H.130(i) Operations under IFR or at night – flight and navigational instruments and associated equipment

CHART HOLDER

An acceptable means of compliance with the chart holder requirement is to display a pre-composed chart on an electronic flight bag (EFB).

GM1 CAT.IDE.H.125&CAT.IDE.H.130 Operations under VFR by day & Operations under IFR or at night – flight and navigational instruments and associated equipment

SUMMARY TABLE

Table 1: Flight and navigational instruments and associated equipment

SERIAL		FLIGHTS UNDER VFR		FLIGHTS UNDER IFR OR AT NIGHT	
INSTRUMENT		SINGLE PILOT	TWO PILOTS REQUIRED	SINGLE PILOT	TWO PILOTS REQUIRED
	(a)	(b)	(c)	(d)	(e)
1	Magnetic direction	1	1	1	1
2	time	1	1	1	1
3	Pressure altitude	1	2	2 Note (1)	2
4	Indicated airspeed	1	2	1	2
5	Vertical speed	1	2	1	2
6	Slip	1	2	1	2
7	Attitude	1 Note (2)	2 Note(2)	1	2
8	Stabilised direction	1 Note (2)	2 Note(2)	1	2
9	Outside air temperature	1	1	1	1
10	Airspeed icing protection	1 Note (3)	2 Note (3)	1	2
11	Airspeed icing protection failure indicating			1 Note (4)	2 Note (4)
12	Static pressure source			2	2
13	Standby attitude			1 Note (5)	1 Note (5)
14	Chart holder			1 Note (6)	1 Note (6)

Note (1) For single pilot night operation under VFR, one means of measuring and displaying pressure altitude may be substituted by a means of measuring and displaying radio altitude.

Note (2) Applicable only to helicopters with a maximum certified take-off mass (MCTOM) of more than 3 175 kg; or helicopters operated over water when out of sight of land or when the visibility is less than 1 500 m.

Note (3) Applicable only to helicopters with an MCTOM of more than 3 175 kg, or with an MOPSC of more than nine.

Note (4) The pitot heater failure annunciation applies to any helicopter issued with an individual CofA on or after 1 August 1999. It also applies before that date when: the helicopter has a MCTOM of more than 3 175 kg and an MOPSC of more than nine.

Note (5) For helicopters with an MCTOM of more than 3 175 kg, CS 29.1303 (g) may require either a gyroscopic rate-of-turn indicator combined with a slip-skid indicator (turn and bank indicator) or a standby attitude indicator satisfying the requirements. In any case, the original type certification standard should be referred to determine the exact requirement.

Note (6) Applicable only to helicopters operating under IFR.

AMC1 CAT.IDE.H.145 Radio altimeters

AUDIO WARNING DEVICE

The audio warning required in CAT.IDE.H.145 should be a voice warning.

AMC1 CAT.IDE.H.160 Airborne weather detecting equipment

GENERAL

The airborne weather detecting equipment should be an airborne weather radar.

AMC1 CAT.IDE.H.170 Flight crew interphone system

TYPE OF FLIGHT CREW INTERPHONE

The flight crew interphone system should not be of a handheld type.

AMC1 CAT.IDE.H.175 Crew member interphone system

SPECIFICATIONS

The crew member interphone system should:

(a) operate independently of the public address system except for handsets, headsets, microphones, selector switches and signalling devices;

(b) in the case of helicopters where at least one cabin crew member is required, be readily accessible for use at required cabin crew stations close to each separate or pair of floor level emergency exits;

(c) in the case of helicopters where at least one cabin crew member is required, have an alerting system incorporating aural or visual signals for use by flight and cabin crew;

(d) have a means for the recipient of a call to determine whether it is a normal call or an emergency call that uses:

(1) lights of different colours;

(2) codes defined by the operator (e.g. different number of rings for normal and emergency calls); and

(3) any other indicating signal specified in the operations manual;

(e) provide a means of two-way communication between the flight crew compartment and each crew member station;

and

(f) be readily accessible for use from each required flight crew station in the flight crew compartment.

AMC1 CAT.IDE.H.180 Public address system

SPECIFICATIONS

The public address system should:

(a) operate independently of the interphone systems except for handsets, headsets, microphones, selector switches and signalling devices;

(b) be readily accessible for immediate use from each required flight crew station;

(c) have, for each floor level passenger emergency exit that has an adjacent cabin crew seat, a microphone operable by the seated cabin crew member, except that one microphone may serve more than one exit, provided the proximity of exits allows unassisted verbal communication between seated cabin crew members;

(d) be operable within 10 seconds by a cabin crew member at each of those stations;

(e) be audible at all passenger seats, lavatories, cabin crew seats and work stations and any other location or compartment that may be occupied by persons; and

(f) following a total failure of the normal electrical generating system, provide reliable operation for a minimum of 10 minutes.

AMC1 CAT.IDE.H.185 Cockpit voice recorder

OPERATIONAL PERFORMANCE REQUIREMENTS

For helicopters first issued with an individual CofA on or after 01 January 2016 the operational performance requirements for cockpit voice recorders (CVRs) should be those laid down in EUROCAE Document ED-112 (Minimum Operational Performance Specification for Crash Protected Airborne Recorder Systems) dated March 2003, including amendments n°1 and n°2, or any later equivalent standard produced by EUROCAE.

AMC1 CAT.IDE.H.190 Flight data recorder

OPERATIONAL PERFORMANCE REQUIREMENTS FOR HELICOPTERS HAVING AN MCTOM OF MORE THAN 3 175 KG AND FIRST ISSUED WITH AN INDIVIDUAL C OF A ON OR AFTER 1 JANUARY 2016

(a) The operational performance requirements for flight data recorders (FDRs) should be those laid down in EUROCAE Document ED-112 (Minimum Operational Performance Specification for Crash Protected Airborne Recorder Systems) dated March 2003, including amendments n°1 and n°2, or any later equivalent standard produced by EUROCAE.

(b) The FDR should, with reference to a timescale, record:

(1) the parameters listed in Table 1 below;

(2) the additional parameters listed in Table 2 below, when the information data source for the parameter is used by helicopter systems or is available on the instrument panel for use by the flight crew to operate the helicopter; and

(3) any dedicated parameters related to novel or unique design or operational characteristics of the helicopter as determined by the Agency.

(c) The FDR parameters should meet, as far as practicable, the performance specifications (range, sampling intervals, accuracy limits and minimum in read-out) defined in the operational performance requirements and specifications of EUROCAE Document ED-112, including amendments n°1 and n°2, or any later equivalent standard produced by EUROCAE.

(d) FDR systems for which some recorded parameters do not meet the performance specifications of EUROCAE Document ED-112 may be acceptable to the Agency.

Table 1: FDR – all helicopters

No*	Parameter
1	Time or relative time count
2	Pressure altitude
3	Indicated airspeed or calibrated airspeed
4	Heading
e	Normal acceleration
6	Pitch attitude
7	Roll attitude
8	Manual radio transmission keying CVR/FDR synchronisation reference
9	Power on each engine
9a	Free power turbine speed (N_F)
9b	Engine torque
9c	Engine gas generator speed (N_G)
9d	Cockpit power control position
9e	Other parameters to enable engine power to be determined
10a	Main rotor speed
10b	Rotor brake (if installed)
11	Primary flight controls – Pilot input and/or control output position (if applicable)
11a	Collective pitch
11b	Longitudinal cyclic pitch
11c	Lateral cyclic pitch
11d	Tail rotor pedal
11e	Controllable stabilator (if applicable)
11f	Hydraulic selection
12	Hydraulics low pressure (each system should be recorded.)
13	Outside air temperature
18	Yaw rate or yaw acceleration
20	Longitudinal acceleration (body axis)
21	Lateral acceleration
25	Marker beacon passage
26	Warnings - a discrete should be recorded for the master warning, gearbox low oil pressure and stability augmentation system failure. Other 'red' warnings should be recorded where the warning condition cannot be determined from other parameters or from the cockpit voice recorder.

No*	Parameter
27	Each navigation receiver frequency selection
37	Engine control modes

* The number in the left hand column reflects the serial numbers depicted in EUROCAE Document ED-112

Table 2: Helicopters for which the data source for the parameter is either used by helicopter systems or is available on the instrument panel for use by the flight crew to operate the helicopter

No*	Parameter
14	AFCS mode and engagement status
15	Stability augmentation system engagement (each system should be recorded)
16	Main gear box oil pressure
17	Gear box oil temperature
17a	Main gear box oil temperature
17b	Intermediate gear box oil temperature
17c	Tail rotor gear box oil temperature
19	Indicated sling load force (if signals readily available)
22	Radio altitude
23	Vertical deviation - the approach aid in use should be recorded.
23a	ILS glide path
23b	MLS elevation
23c	GNSS approach path
24	Horizontal deviation - the approach aid in use should be recorded.
24a	ILS localiser
24b	MLS azimuth
24c	GNSS approach path
28	DME 1 & 2 distances
29	Navigation data
29a	Drift angle
29b	Wind speed
29c	Wind direction
29d	Latitude
29e	Longitude
29f	Ground speed
30	Landing gear or gear selector position
31	Engine exhaust gas temperature (T_4)
32	Turbine inlet temperature (TIT/ITT)
33	Fuel contents
34	Altitude rate (vertical speed) - only necessary when available from cockpit instruments
35	Ice detection

No*	Parameter
36	Helicopter health and usage monitor system (HUMS)
	Engine data
36a	Chip detector
36b	Track timing
36c	Exceedance discretes
36d	Broadband average engine vibration
36e	
38	Selected barometric setting - to be recorded for helicopters where the parameter is displayed electronically
38a	Pilot
38b	Co-pilot
39	Selected altitude (all pilot selectable modes of operation) - to be recorded for the helicopters where the parameter is displayed electronically
40	Selected speed (all pilot selectable modes of operation) - to be recorded for the helicopters where the parameter is displayed electronically
41	Selected Mach (all pilot selectable modes of operation) - to be recorded for the helicopters where the parameter is displayed electronically
42	Selected vertical speed (all pilot selectable modes of operation) - to be recorded for the helicopters where the parameter is displayed electronically
43	Selected heading (all pilot selectable modes of operation) - to be recorded for the helicopters where the parameter is displayed electronically
44	Selected flight path (all pilot selectable modes of operation) - to be recorded for the helicopters where the parameter is displayed electronically
45	Selected decision height (all pilot selectable modes of operation) - to be recorded for the helicopters where the parameter is displayed electronically
46	EFIS display format
47	Multi-function / engine / alerts display format
48	Event marker

* The number in the left hand column reflects the serial numbers depicted in EUROCAE Document ED-112

AMC2 CAT.IDE.H.190 Flight data recorder

LIST OF PARAMETERS TO BE RECORDED FOR HELICOPTERS HAVING AN MCTOM OF MORE THAN 3 175 KG AND FIRST ISSUED WITH AN INDIVIDUAL COFA ON OR AFTER 1 AUGUST 1999 AND BEFORE 1 JANUARY 2016 AND HELICOPTERS HAVING AN MCTOM OF MORE THAN 7 000 KG OR AN MOPSC OF MORE THAN NINE AND FIRST ISSUED WITH AN INDIVIDUAL COFA ON OR AFTER 1 JANUARY 1989 AND BEFORE 1 AUGUST 1999

(a) The FDR should, with reference to a timescale, record:

(1) for helicopters with an MCTOM between 3 175 kg and 7 000 kg the parameters listed in Table 1 below;

(2) for helicopters with an MCTOM of more than 7 000 kg the parameters listed in Table 2 below;

(3) for helicopters equipped with electronic display systems, the additional parameters listed in Table 3 below; and

(4) any dedicated parameters relating to novel or unique design or operational characteristics of the helicopter.

(b) When determined by the Agency, the FDR of helicopters with an MCTOM of more than 7 000 kg do not need to record parameter 19 of Table 2 below, if any of the following conditions are met:

(1) the sensor is not readily available; or

(2) a change is required in the equipment that generates the data.

(c) Individual parameters that can be derived by calculation from the other recorded parameters need not to be recorded, if agreed by the competent authority.

(d) The parameters should meet, as far as practicable, the performance specifications (range, sampling intervals, accuracy limits and resolution in read-out) defined in AMC3 CAT.IDE.H.190.

(e) If recording capacity is available, as many of the additional parameters as possible specified in table II-A.2 of EUROCAE Document ED 112 dated March 2003 should be recorded.

(f) For the purpose of this AMC a sensor is considered 'readily available' when it is already available or can be easily incorporated.

Table 1: Helicopters with an MCTOM of 7 000 kg or less

No	Parameter
1	Time or relative time count
2	Pressure altitude
3	Indicated airspeed or calibrated airspeed
4	Heading
5	Normal acceleration
6	Pitch attitude
7	Roll attitude
8	Manual radio transmission keying
9	Power on each engine (free power turbine speed and engine torque) / cockpit power control position (if applicable)
10a 10b	Main rotor speed Rotor brake (if installed)
11 11a 11b 11c 11d 11e 11f	Primary flight controls - pilot input and control output position (if applicable) Collective pitch Longitudinal cyclic pitch Lateral cyclic pitch Tail rotor pedal Controllable stabilator Hydraulic selection
13	Outside air temperature

14	Autopilot engagement status
15	Stability augmentation system engagement
26	Warnings

Table 2: Helicopters with an MCTOM of more than 7 000 kg

No	Parameter
1	Time or relative time count
2	Pressure altitude
3	Indicated airspeed or calibrated airspeed
4	Heading
5	Normal acceleration
6	Pitch attitude
7	Roll attitude
8	Manual radio transmission keying
9	Power on each engine (free power turbine speed and engine torque) / cockpit power control position (if applicable)
10a 10b	Main rotor speed Rotor brake (if installed)
11 11a 11b 11c 11d 11e 11f	Primary flight controls - pilot input and control output position (if applicable) Collective pitch Longitudinal cyclic pitch Lateral cyclic pitch Tail rotor pedal Controllable stabilator Hydraulic selection
12	Hydraulics low pressure
13	Outside air temperature
14	AFCS mode and engagement status
15	Stability augmentation system engagement
16	Main gear box oil pressure
17	Main gear box oil temperature
18	Yaw rate or yaw acceleration
19	Indicated sling load force (if installed)
20	Longitudinal acceleration (body axis)
21	Lateral acceleration
22	Radio altitude
23	Vertical beam deviation (ILS glide path or MLS elevation)
24	Horizontal beam deviation (ILS localiser or MLS azimuth)
25	Marker beacon passage
26	Warnings

No	Parameter
27	Reserved (navigation receiver frequency selection is recommended)
28	Reserved (DME distance is recommended)
29	Reserved (navigation data is recommended)
30	Landing gear or gear selector position

Table 3: Helicopters equipped with electronic display systems

No	Parameter
38	Selected barometric setting (each pilot station)
39	Selected altitude
40	Selected speed
41	Selected Mach
42	Selected vertical speed
43	Selected heading
44	Selected flight path
45	Selected decision height
46	EFIS display format
47	Multi-function / engine / alerts display format

AMC3 CAT.IDE.H.190 Flight data recorder

PERFORMANCE SPECIFICATIONS FOR THE PARAMETERS TO BE RECORDED FOR HELICOPTERS HAVING AN MCTOM OF MORE THAN 3 175 KG AND FIRST ISSUED WITH AN INDIVIDUAL COFA ON OR AFTER 1 AUGUST 1999 AND BEFORE 1 JANUARY 2016 AND HELICOPTERS HAVING AN MCTOM OF MORE THAN 7 000 KG OR AN MOPSC OF MORE THAN NINE AND FIRST ISSUED WITH AN INDIVIDUAL COFA ON OR AFTER 1 JANUARY 1989 AND BEFORE 1 AUGUST 1999

Table 1: Helicopters with an MCTOM of 7 000 kg or less

No	Parameter	Range	Sampling interval in seconds	Accuracy Limits (sensor input compared to FDR read out)	Minimum Resolution in read out	Remarks
1	Time or relative time count					
1a or	Time	24 hours	4	± 0.125 % per hour	1 second	(a) UTC time preferred where available.
1b	Relative Time Count	0 to 4 095	4	± 0.125 % per hour		(b) Counter increments every 4 seconds of system operation.
2	Pressure altitude	-1 000 ft to 20 000 ft	1	±100 ft to ±700 ft Refer to table II.A-2 of EUROCAE Document ED-112	25 ft	
3	Indicated airspeed or calibrated airspeed	As the installed measuring system	1	± 5 % or ± 10 kt, whichever is greater	1 kt	
4	Heading	360 °	1	± 5°	1 °	
5	Normal acceleration	- 3 g to + 6 g	0.125	± 0.2 g in addition to a maximum offset of ± 0.3 g	0.01 g	The resolution may be rounded from 0.01 g to 0.05 g, provided that one sample is recorded at full resolution at least every 4 seconds.
6	Pitch attitude	100 % of usable range	0.5	± 2 degrees	0.8 degree	
7	Roll attitude	± 60 ° or 100 % of usable range from installed system if greater	0.5	± 2 degrees	0.8 degree	.
8	Manual radio transmission keying	Discrete(s)	1	-	-	Preferably each crew member but one discrete acceptable for all transmissions.
9	Power on each engine	Full range	Each engine each second	± 5 %	1 % of full range	Sufficient parameters e.g. Power Turbine Speed and Engine Torque should be recorded to enable engine power to be determined. A margin for possible overspeed should be provided. Data may be
9a	Power turbine speed	Maximum range				
9b	Engine torque	Maximum range				
9c	Cockpit power control position	Full range or each discrete	Each control each second	±2 % or sufficient to determine any gated position	2 % of full range	

No	Parameter	Range	Sampling interval in seconds	Accuracy Limits (sensor input compared to FDR read out)	Minimum Resolution in read out	Remarks
		position				obtained from cockpit indicators used for aircraft certification. Parameter 9c is required for helicopters with non mechanically linked cockpit-engine controls
10	Rotor					
10a	Main rotor speed	Maximum range	1	± 5 %	1 % of full range	
10b	Rotor brake	Discrete	1	-		Where available
11	Primary flight controls - Pilot input and/or* control output position					* For helicopters that can demonstrate the capability of deriving either the control input or control movement (one from the other) for all modes of operation and flight regimes, the 'or' applies. For helicopters with non-mechanical control systems the 'and' applies. Where the input controls for each pilot can be operated independently, both inputs will need to be recorded.
11a	Collective pitch	Full range	0.5	± 3 %	1 % of full range	
11b	Longitudinal cyclic pitch		0.5			
11c	Lateral cyclic pitch		0.5			
11d	Tail rotor pedal		0.5			
11e	Controllable stabilator		0.5			
11f	Hydraulic selection	Discretes	1	-	-	
12	Outside air temperature	Available range from installed system	2	± 2°C	0.3°C	
13	Autopilot engagement status	Discrete(s)	1			Where practicable, discretes should show which primary modes are controlling the flight path of the helicopter
14	Stability augmentation system engagement	Discrete(s)	1			

No	Parameter	Range	Sampling interval in seconds	Accuracy Limits (sensor input compared to FDR read out)	Minimum Resolution in read out	Remarks
15	Warnings	Discrete(s)	1	-	-	A discrete should be recorded for the master warning, low hydraulic pressure (each system) gearbox low oil pressure and SAS fault status. Other 'red' warnings should be recorded where the warning condition cannot be determined from other parameters or from the cockpit voice recorder.

Table 2: Helicopters with an MCTOM of more than 7 000 kg

N°	Parameter	Range	Sampling interval in seconds	Accuracy Limits (sensor input compared to FDR read out)	Minimum Resolution in read out	Remarks
1	Time or relative time count					
1a or	Time	24 hours	4	± 0.125 % per hour	1 second	(a) UTC time preferred where available.
1b	Relative time count	0 to 4095	4	± 0.125 % per hour		(b) Counter increments every 4 seconds of system operation.
2	Pressure altitude	-1 000 ft to maximum certificated altitude of aircraft +5 000 ft	1	± 100 ft to ± 700 ft Refer to table II-A.3 EUROCAE Document ED-112	5 ft	Should be obtained from the air data computer when installed.
3	Indicated airspeed or calibrated airspeed	As the installed measuring system	1	± 3 %	1 kt	Should be obtained from the air data computer when installed.
4	Heading	360 degrees	1	± 2 degrees	0.5 degree	
5	Normal acceleration	-3 g to +6 g	0.125	1 % of range excluding a datum error of 5 %	0.004 g	The recording resolution may be rounded from 0.004 g to 0.01 g provided that one sample is recorded at full resolution at least every 4 seconds.
6	Pitch attitude	± 75 degrees	0.5	± 2 degrees	0.5 degree	

N°	Parameter	Range	Sampling interval in seconds	Accuracy Limits (sensor input compared to FDR read out)	Minimum Resolution in read out	Remarks
7	Roll attitude	± 180 degrees	0.5	± 2 degrees	0.5 degree	.
8	Manual radio transmission Keying and CVR/FDR synchronization reference	Discrete(s)	1	-	-	Preferably each crew member but one discrete acceptable for all transmissions provided that the replay of a recording made by any required recorder can be synchronised in time with any other required recording to within 1 second.
9	Power on each engine	Full range	Each engine each second	± 2 %	0.2 % of full range	Sufficient parameters e.g. Power Turbine Speed and engine torque should be recorded to enable engine power to be determined. A margin for possible overspeed should be provided.
9a	Free power turbine speed (N_F)	0-130 %				
9b	Engine torque	Full range				
9c	Cockpit power control position	Full range or each discrete position	Each control each second	± 2 % or sufficient to determine any gated position	2 % of full range	Parameter 9c is required for helicopters with non mechanically linked cockpit-engine controls
10 10a	Rotor Main rotor speed	50 to 130 %	0.5	2 %	0.3 % of full range	.
10b	Rotor brake	Discrete	1			Where available
11	Primary flight controls - Pilot input and/or* control output position					* For helicopters that can demonstrate the capability of deriving either the control input or control movement (one from the other) for all modes of operation and flight regimes, the 'or' applies. For helicopters with non-mechanical control systems the 'and' applies. Where the input controls for each pilot can be operated independently, both inputs will need to be recorded.
11a	Collective pitch	Full range	0.5	± 3 % unless higher accuracy is uniquely required	0.5 % of operating range	
11b	Longitudinal cyclic pitch		0.5			
11c	Lateral cyclic pitch		0.5			
11d	Tail rotor pedal		0.5			
11e	Controllable stabilator		0.5			
11f	Hydraulic selection	Discrete(s)	1	-	-	
12	Hydraulics low pressure	Discrete(s)	1	-	-	Each essential system should be recorded.
13	Outside air temperature	-50° to +90°C or available sensor range	2	± 2°C	0.3°C	
14	AFCS mode and	A suitable	1	-	-	Discretes should show which systems

N°	Parameter	Range	Sampling interval in seconds	Accuracy Limits (sensor input compared to FDR read out)	Minimum Resolution in read out	Remarks
	engagement status	combination of discretes				are engaged and which primary modes are controlling the flight path of the helicopter
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 degrees/second	0.25	± 1 %	2 degrees per second	An equivalent yaw acceleration is an acceptable alternative.
19	Indicated sling load force	0 to 200 % of maximum certified load	0.5	± 3 % of maximum certified load	0.5 % for maximum certified load	With reasonable practicability if sling load indicator is installed.
20	Longitudinal acceleration (body axis)	± 1 g	0.25	±1.5 % of range excluding a datum error of ±5 %	0.004 g	See comment to parameter 5.
21	Lateral acceleration	± 1 g	0.25	±1.5 % of range excluding a datum error of ±5 %	0.004 g	See comment to parameter 5.
22	Radio altitude	-20 ft to +2 500 ft	1	As installed. ± 2 ft or ± 3 % whichever is greater below 500 ft and ± 5 % above 500 ft recommended	1 ft below 500 ft, 1 ft + 0.5 % of full range above 500 ft	
23	Vertical beam deviation		1	As installed ± 3 % recommended	0.3 % of full range	Data from both the ILS and MLS systems need not to be recorded at the same time. The approach aid in use should be recorded.
23a	ILS glide path	± 0.22 DDM or available sensor range as installed				
23b	MLS elevation	+0.9 to +30 degrees				
24	Horizontal beam deviation		1	As installed. ± 3 % recommended	0.3 % of full range	See comment to parameter 23

N°	Parameter	Range	Sampling interval in seconds	Accuracy Limits (sensor input compared to FDR read out)	Minimum Resolution in read out	Remarks
24a	ILS localiser	± 0.22 DDM or available sensor range as installed				
24b	MLS azimuth	± 62 degrees				
25	Marker beacon passage	Discrete	1	-	-	One discrete is acceptable for all markers.
26	Warnings	Discretes	1	-	-	A discrete should be recorded for the master warning, gearbox low oil pressure and SAS failure. Other 'red' warnings should be recorded where the warning condition cannot be determined from other parameters or from the cockpit voice recorder.
27	Reserved					
28	Reserved					
29	Reserved					
30	Landing gear or gear selector position	Discrete(s)	4	-	-	Where installed.

Table 3: Helicopters equipped with electronic display systems

N°	Parameter	Range	Sampling interval in seconds	Accuracy Limits (sensor input compared to FDR read out)	Minimum Resolution in read out	Remarks
38	Selected barometric setting (each pilot station)	As installed	64	As installed	1mb	Where practicable, a sampling interval of 4 seconds is recommended
38a	Pilot					
38b	Co-pilot					
39	Selected altitude	As installed	1	As installed	100 ft	Where capacity is limited a sampling interval of 64 seconds is permissible

N°	Parameter	Range	Sampling interval in seconds	Accuracy Limits (sensor input compared to FDR read out)	Minimum Resolution in read out	Remarks
39a	Manual					
39b	Automatic					
40	Selected speed	As installed	1	As installed	1 kt	Where capacity is limited a sampling interval of 64 seconds is permissible
40a	Manual					
40b	Automatic					
41	Selected Mach	As installed	1	As installed	0.01	Where capacity is limited a sampling interval of 64 seconds is permissible
41a	Manual					
41b	Automatic					
42	Selected vertical speed	As installed	1	As installed	100 ft /min	Where capacity is limited a sampling interval of 64 seconds is permissible
42a	Manual					
42b	Automatic					
43	Selected heading	360 degrees	1	As installed	100 ft /min	Where capacity is limited a sampling interval of 64 seconds is permissible
44	Selected flight path		1	As installed		
44a	Course/DSTRK				1 degree	
44b	Path angle				0.1 degree	
45	Selected decision height	0-500 ft	64	As installed	1ft	
46	EFIS display format	Discrete(s)	4	-	-	Discretes should show the display system status e.g. normal, fail, composite, sector, plan, rose, nav aids, wxr, range, copy
46a	Pilot					
46b	Co-pilot					

N°	Parameter	Range	Sampling interval in seconds	Accuracy Limits (sensor input compared to FDR read out)	Minimum Resolution in read out	Remarks
47	Multi function / engine / alerts display format	Discrete(s)	4	-	-	Discretes should show the display system status e.g. normal, fail, and the identity of the display pages for the emergency procedures and checklists. Information in checklists and procedures need not be recorded.

The term 'where practicable' used in the remarks column of Table 3 means that account should be taken of the following:

(a) if the sensor is already available or can be easily incorporated;

(b) sufficient capacity is available in the flight recorder system;

(c) for navigational data (nav frequency selection, DME distance, latitude, longitude, groundspeed and drift) the signals are available in digital form;

(d) the extent of modification required;

(e) the down-time period; and

(f) equipment software development.

GM1 CAT.IDE.H.190 Flight data recorder

GENERAL

For the purpose of AMC2 CAT.IDE.H.190(b) a sensor is considered 'readily available' when it is already available or can be easily incorporated.

AMC1 CAT.IDE.H.195 Data link recording

GENERAL

(a) The helicopter should be capable of recording the messages as specified in this AMC.

(b) As a means of compliance with CAT.IDE.H.195(a), the recorder on which the data link messages are recorded may be:

(1) the CVR;

(2) the FDR;

(3) a combination recorder when CAT.IDE.H.200 is applicable; or

(4) a dedicated flight recorder. In that case, the operational performance requirements for this recorder should be those laid down in EUROCAE Document ED-112 (Minimum Operational Performance Specification for Crash Protected Airborne Recorder Systems) dated March 2003, including amendments n°1 and n°2, or any later equivalent standard produced by EUROCAE.

(c) As a means of compliance with CAT.IDE.H.195 (a)(2), the operator should enable correlation by providing information that allows an accident investigator to understand what data were provided to the helicopter and, when the provider identification is contained in the message, by which provider.

(d) The timing information associated with the data link communications messages required to be recorded by CAT.IDE.H.195 (a)(3) should be capable of being determined from the airborne-based recordings. This timing information should include at least the following:

(1) the time each message was generated;

(2) the time any message was available to be displayed by the crew;

(3) the time each message was actually displayed or recalled from a queue; and

(4) the time of each status change.

(e) The message priority should be recorded when it is defined by the protocol of the data link communication message being recorded.

(f) The expression 'taking into account the system architecture', in CAT.IDE.H.195 (a)(3), means that the recording of the specified information may be omitted if the existing source systems involved would require a major upgrade. The following should be considered:

(1) the extent of the modification required;

(2) the down-time period; and

(3) equipment software development.

(g) The intention is that new designs of source systems should include this functionality and support the full recording of the required information.

(h) Data link communications messages that support the applications in Table 1 below should be recorded.

(i) Further details on the recording requirements can be found in the recording requirement matrix in Appendix D.2 of EUROCAE Document ED-93 (Minimum Aviation System Performance Specification for CNS/ATM Recorder Systems, dated November 1998).

Table 1: Applications

Item No	Application Type	Application Description	Required Recording Content
1	Data link initiation	This includes any application used to log on to, or initiate, a data link service. In future air navigation system (FANS)-1/A and air traffic navigation (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 air traffic controllers. In FANS-1/A and ATN, this includes the controller pilot data link communications (CPDLC) application. CPDLC includes the exchange of oceanic clearances (OCLs) and departure clearances (DCLs).	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.	C, F2

4	Flight information	This includes any application used for delivery of flight information data to specific aeroplanes. This includes for example data link-automatic terminal information service (D-ATIS), data link-operational terminal information service (D-OTIS), digital weather information services (D-METAR or TWIP), data link flight information service (D-FIS) and Notice to Airmen (D-NOTAM) delivery.	C
5	Aircraft broadcast surveillance	This includes elementary and enhanced surveillance systems, as well as automatic dependent surveillance-broadcast (ADS-B) output data.	M*, F2
6	Airlines operations centre (AOC) data	This includes any application transmitting or receiving data used for AOC purposes (in accordance with the ICAO definition of AOC). Such systems may also process AAC messages, but there is no requirement to record AAC messages	M*
7	Graphics	This includes any application receiving graphical data to be used for operational purposes (i.e. excluding applications that are receiving such things as updates to manuals).	M* F1

GM1 CAT.IDE.H.195 Data link recording

DEFINITIONS AND ACRONYMS

(a) The letters and expressions in Table 1 of AMC1 CAT.IDE.H.195 have the following meaning:

C: Complete contents recorded

M: Information that enables correlation with 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.

F1: Graphics applications may be considered as AOC data when they are part of a data link communications application service run on an individual basis by the operator itself in the framework of the operational control.

F2: Where parametric data sent by the helicopter, such as Mode S, is reported within the message, it should be recorded unless data from the same source is recorded on the FDR.

(b) The definitions of the applications type in Table 1 of AMC1 CAT.IDE.H.195 are described in Table 1 below.

Table 1: Descriptions of the applications type

Item No	Application Type	Messages	Comments
1	CM		CM is an ATN service
2	AFN		AFN is a FANS 1/A service
3	CPDLC		All implemented up and downlink messages to be recorded
4	ADS-C	ADS-C reports	All contract requests and reports recorded
		Position reports	Only used within FANS 1/A. Only used in oceanic and remote areas.
5	ADS-B	Surveillance data	Information that enables correlation with any associated records stored separately from the helicopter.
6	D-FIS		D-FIS is an ATN service. All implemented up and downlink messages to be recorded
7	TWIP	TWIP messages	Terminal weather information for pilots
8	D-ATIS	ATIS messages	Refer to EUROCAE Document ED-89A dated December 2003. Data Link Application System Document (DLASD) for the 'ATIS' Data Link Service
9	OCL	OCL messages	Refer to EUROCAE Document ED-106A dated March 2004. Data Link Application System Document (DLASD) for 'Oceanic Clearance' Data Link Service
10	DCL	DCL messages	Refer to EUROCAE Document ED-85A dated December 2003. Data Link Application System Document (DLASD) for 'Departure Clearance' Data Link Service
11	Graphics	Weather maps & other graphics	Graphics exchanged in the framework of procedures within the operational control, as specified in Part-ORO. Information that enables correlation with any associated records stored separately from the aeroplane.
12	AOC	Aeronautical operational control messages	Messages exchanged in the framework of procedures within the operational control, as specified in Part-ORO. Information that enables correlation with any associated records stored separately from the helicopter. Definition in EUROCAE Document ED-112, dated March 2003.
13	Surveillance	Downlinked aircraft parameters (DAP)	As defined in ICAO Annex 10 Volume IV (Surveillance systems and ACAS).

AAC aeronautical administrative communications

ADS-B automatic dependent surveillance - broadcast

ADS-C automatic dependent surveillance – contract

AFN aircraft flight notification

AOC aeronautical operational control

ATIS automatic terminal information service

ATSC air traffic service communication

CAP controller access parameters

CPDLC	controller pilot data link communications
CM	configuration/context management
D-ATIS	data link ATIS
D-FIS	data link flight information service
DCL	departure clearance
FANS	Future Air Navigation System
FLIPCY	flight plan consistency
OCL	oceanic clearance
SAP	system access parameters
TWIP	terminal weather information for pilots

AMC1 CAT.IDE.H.200 Flight data and cockpit voice combination recorder

GENERAL

(a) A flight data and cockpit voice combination recorder is a flight recorder that records:

(1) all voice communications and the aural environment required by CAT.IDE.H.185 regarding CVRs; and

(2) all parameters required by CAT.IDE.H.190 regarding FDRs, with the same specifications required by those paragraphs.

(b) In addition a flight data and cockpit voice combination recorder may record data link communication messages and related information required by CAT.IDE.H.195.

AMC1 CAT.IDE.H.205 Seats, seat safety belts, restraint systems and child restraint devices

CHILD RESTRAINT DEVICES (CRDS)

(a) A CRD is considered to be acceptable if:

(1) it is a 'supplementary loop belt' manufactured with the same techniques and the same materials of the approved safety belts; or

(2) it complies with (b).

(b) Provided the CRD can be installed properly on the respective helicopter seat, the following CRDs are considered acceptable:

(1) CRDs approved for use in aircraft by a competent authority on the basis of a technical standard and marked accordingly;

(2) CRDs approved for use in motor vehicles according to the UN standard ECE R 44, -03 or later series of amendments;

(3) CRDs approved for use in motor vehicles and aircraft according to Canadian CMVSS 213/213.1;

(4) CRDs approved for use in motor vehicles and aircraft according to US FMVSS No 213 and are manufactured to these standards on or after February 26,

1985. US approved CRDs manufactured after this date must bear the following labels in red letters:

(i) "THIS CHILD RESTRAINT SYSTEM CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS"; and

(ii) "THIS RESTRAINT IS CERTIFIED FOR USE IN MOTOR VEHICLES AND AIRCRAFT";

(5) CRDs qualified for use in aircraft according to the German 'Qualification Procedure for Child Restraint Systems for Use in Aircraft' (TÜV Doc.: TÜV/958-01/2001); and

(6) devices approved for use in cars, manufactured and tested to standards equivalent to those listed above. The device should be marked with an associated qualification sign, which shows the name of the qualification organisation and a specific identification number, related to the associated qualification project. The qualifying organisation should be a competent and independent organisation that is acceptable to the competent authority.

(c) Location

(1) Forward facing CRDs may be installed on both forward and rearward facing passenger seats but only when fitted in the same direction as the passenger seat on which they are positioned. Rearward facing CRDs should only be installed on forward facing passenger seats. A CRD should not be installed within the radius of action of an airbag, unless it is obvious that the airbag is de-activated or it can be demonstrated that there is no negative impact from the airbag.

(2) An infant in a CRD should be located as near to a floor level exit as feasible.

(3) An infant in a CRD should not hinder evacuation for any passenger.

(4) An infant in a CRD should neither be located in the row (where rows are existing) leading to an emergency exit nor located in a row immediately forward or aft of an emergency exit. A window passenger seat is the preferred location. An aisle passenger seat or a cross aisle passenger seat that forms part of the evacuation route to exits is not recommended. Other locations may be acceptable provided the access of neighbour passengers to the nearest aisle is not obstructed by the CRD.

(5) In general, only one CRD per row segment is recommended. More than one CRD per row segment is allowed if the infants are from the same family or travelling group provided the infants are accompanied by a responsible adult sitting next to them.

(6) A row segment is the fraction of a row separated by two aisles or by one aisle and the helicopter fuselage.

(d) Installation

(1) CRDs should only be installed on a suitable helicopter seat with the type of connecting device they are approved or qualified for. E.g., CRDs to be connected by a three point harness only (most rearward facing baby CRDs currently available) should not be attached to a helicopter seat with a lap belt only, a CRD designed to be attached to a vehicle seat by means of rigid bar

lower anchorages (ISO-FIX or US equivalent) only, should only be used on helicopter seats that are equipped with such connecting devices and should not be attached by the helicopter seat lap belt. The method of connecting should be the one shown in the manufacturer's instructions provided with each CRD.

(2) All safety and installation instructions must be followed carefully by the responsible person accompanying the infant. Cabin crew should prohibit the use of any inadequately installed CRD or not qualified seat.

(3) If a forward facing CRD with a rigid backrest is to be fastened by a lap belt, the restraint device should be fastened when the backrest of the passenger seat on which it rests is in a reclined position. Thereafter, the backrest is to be positioned upright. This procedure ensures better tightening of the CRD on the aircraft seat if the aircraft seat is reclinable.

(4) The buckle of the adult safety belt must be easily accessible for both opening and closing, and must be in line with the seat belt halves (not canted) after tightening.

(5) Forward facing restraint devices with an integral harness must not be installed such that the adult safety belt is secured over the infant.

(e) Operation

(1) Each CRD should remain secured to a passenger seat during all phases of flight, unless it is properly stowed when not in use.

(2) Where a CRD is adjustable in recline it must be in an upright position for all occasions when passenger restraint devices are required.

AMC2 CAT.IDE.H.205 Seats, seat safety belts, restraint systems and child restraint devices

UPPER TORSO RESTRAINT SYSTEM

An upper torso restraint system having three straps is deemed to be compliant with the requirement for restraint systems with two shoulder straps.

SAFETY BELT

A safety belt with diagonal should strap (three anchorage points) is deemed to be compliant with safety belts (two anchorage points).

AMC3 CAT.IDE.H.205 Seats, seat safety belts, restraint systems and child restraint devices

SEATS FOR MINIMUM REQUIRED CABIN CREW

(a) Seats for the minimum required cabin crew members should be located near required floor level emergency exits, except if the emergency evacuation of passengers would be enhanced by seating the cabin crew members elsewhere. In this case other locations are acceptable. This criterion should also apply if the number of required cabin crew members exceeds the number of floor level emergency exits.

(b) Seats for cabin crew member(s) should be forward or rearward facing within 15° of the longitudinal axis of the helicopter.

AMC1 CAT.IDE.H.220 First-aid kits

CONTENT OF FIRST-AID KITS

(a) First-aid kits should be equipped with appropriate and sufficient medications and instrumentation. However, these kits should be complemented by the operator according to the characteristics of the operation (scope of operation, flight duration, number and demographics of passengers etc.).

(b) The following should be included in the first-aid kit:

(1) Equipment

(i) bandages (assorted sizes);

(ii) burns dressings (unspecified);

(iii) wound dressings (large and small);

(iv) adhesive dressings (assorted sizes);

(v) adhesive tape;

(vi) adhesive wound closures;

(vii) safety pins;

(viii) safety scissors;

(ix) antiseptic wound cleaner;

(x) disposable resuscitation aid;

(xi) disposable gloves;

(xii) tweezers: splinter; and

(xiii) thermometers (non mercury).

(2) Medications

(i) simple analgesic (may include liquid form);

(ii) antiemetic;

(iii) nasal decongestant;

(iv) gastrointestinal antacid, in the case of helicopters carrying more than nine passengers;

(v) anti-diarrhoeal medication in the case of helicopters carrying more than nine passengers; and

(vi) antihistamine.

(3) Other

(i) a list of contents in at least two languages (English and one other). This should include information on the effects and side effects of medications carried;

(ii) first-aid handbook, current edition;

(iii) medical incident report form;

(iv) biohazard disposal bags.

(4) An eye irrigator, whilst not required to be carried in the first-aid kit, should, where possible, be available for use on the ground.

AMC2 CAT.IDE.H.220 First-aid kits

MAINTENANCE OF FIRST-AID KITS

To be kept up to date first-aid kits should be:

(a) inspected periodically to confirm, to the extent possible, that contents are maintained in the condition necessary for their intended use;

(b) replenished at regular intervals, in accordance with instructions contained on their labels, or as circumstances warrant; and

(c) replenished after use-in-flight at the first opportunity where replacement items are available.

AMC1 CAT.IDE.H.240 Supplemental oxygen - non-pressurised helicopters

DETERMINATION OF OXYGEN

The amount of supplemental oxygen for sustenance for a particular operation should be determined on the basis of flight altitudes and flight duration, consistent with the operating procedures, including emergency, procedures, established for each operation and the routes to be flown as specified in the operations manual.

AMC1 CAT.IDE.H.250 Hand fire extinguishers

NUMBER, LOCATION AND TYPE

(a) The number and location of hand fire extinguishers should be such as to provide adequate availability for use, account being taken of the number and size of the passenger compartments, the need to minimise the hazard of toxic gas concentrations and the location of lavatories, galleys etc. These considerations may result in a number of fire extinguishers greater than the minimum required.

(b) There should be at least one hand fire extinguisher installed in the flight crew compartment and this should be suitable for fighting both flammable fluid and electrical equipment fires. Additional hand fire extinguishers may be required for the protection of other compartments accessible to the crew in flight. Dry chemical fire extinguishers should not be used in the flight crew compartment, or in any compartment not separated by a partition from the flight crew compartment, because of the adverse effect on vision during discharge and, if conductive, interference with electrical contacts by the chemical residues.

(c) Where only one hand fire extinguisher is required in the passenger compartments it should be located near the cabin crew member’s station, where provided.

(d) Where two or more hand fire extinguishers are required in the passenger compartments and their location is not otherwise dictated by consideration of (a),

an extinguisher should be located near each end of the cabin with the remainder distributed throughout the cabin as evenly as is practicable.

(e) Unless an extinguisher is clearly visible, its location should be indicated by a placard or sign. Appropriate symbols may also be used to supplement such a placard or sign.

AMC1 CAT.IDE.H.260 Marking of break-in points

MARKINGS – COLOUR AND CORNERS

(a) The colour of the markings should be red or yellow and, if necessary, should be outlined in white to contrast with the background.

(b) If the corner markings are more than 2 m apart, intermediate lines 9 cm x 3 cm should be inserted so that there is no more than 2 m between adjacent markings.

AMC1 CAT.IDE.H.270 Megaphones

LOCATION OF MEGAPHONES

(a) The megaphone should be readily accessible at the assigned seat of a cabin crew member or crew members other than flight crew.

(b) This does not necessarily require megaphones to be positioned such that they can be physically reached by a crew member when strapped in a cabin crew member's seat.

AMC1 CAT.IDE.H.280 Emergency locator transmitter (ELT)

ELT BATTERIES

Batteries used in the ELTs should be replaced (or recharged, if the battery is rechargeable) when the equipment has been in use for more than 1 cumulative hour, and also when 50 % of their useful life (or for rechargeable, 50 % of their useful life of charge), as established by the equipment manufacturer has expired. The new expiry date for the replacement (or recharged) battery should be legibly marked on the outside of the equipment. The battery useful life (or useful life of charge) requirements of this paragraph do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals.

AMC2 CAT.IDE.H.280 Emergency locator transmitter (ELT)

TYPES OF ELT AND GENERAL TECHNICAL SPECIFICATIONS

(a) The ELT required by this provision should be one of the following:

(1) Automatic Fixed (ELT(AF)). An automatically activated ELT that is permanently attached to an helicopter and is designed to aid search and rescue (SAR) teams in locating the crash site.

(2) Automatic Portable (ELT(AP)). An automatically activated ELT, which is rigidly attached to a helicopter before a crash, but is readily removable from the helicopter after a crash. It functions as an ELT during the crash sequence. If the ELT does not employ an integral antenna, the helicopter-mounted antenna

may be disconnected and an auxiliary antenna (stored on the ELT case) attached to the ELT. The ELT can be tethered to a survivor or a life-raft. This type of ELT is intended to aid SAR teams in locating the crash site or survivor(s).

(3) Automatic Deployable (ELT(AD)). An ELT that is rigidly attached to the helicopter before the crash and that is automatically ejected, deployed and activated by an impact, and, in some cases, also by hydrostatic sensors. Manual deployment is also provided. This type of ELT should float in water and is intended to aid SAR teams in locating the crash site.

(4) Survival ELT (ELT(S)). An ELT that is removable from a helicopter, stowed so as to facilitate its ready use in an emergency, and manually activated by a survivor. An ELT(S) may be activated manually or automatically (e.g. by water activation). It should be designed either to be tethered to a life-raft or a survivor.

(b) To minimise the possibility of damage in the event of crash impact, the automatic ELT should be rigidly fixed to the helicopter structure, as far aft as is practicable, with its antenna and connections arranged so as to maximise the probability of the signal being transmitted after a crash.

(c) Any ELT carried should operate in accordance with the relevant provisions of ICAO Annex 10, Volume III Communications Systems and should be registered with the national agency responsible for initiating search and rescue or other nominated agency.

AMC1 CAT.IDE.H.290(a) Life-jackets

ACCESSIBILITY

The life-jacket should be accessible from the seat or berth of the person for whose use it is provided, with a safety belt or harness fastened.

AMC2 CAT.IDE.H.290(c) Life-jackets

ELECTRIC ILLUMINATION

The means of electric illumination should be a survivor locator light as defined in the applicable ETSO issued by the Agency or equivalent.

GM1 CAT.IDE.H.290 Life-jackets

SEAT CUSHIONS

Seat cushions are not considered to be flotation devices.

GM1 CAT.IDE.H.295 Crew survival suits

ESTIMATING SURVIVAL TIME

(a) Introduction

(1) A person accidentally immersed in cold seas (typically offshore Northern Europe) will have a better chance of survival if he/she is wearing an effective

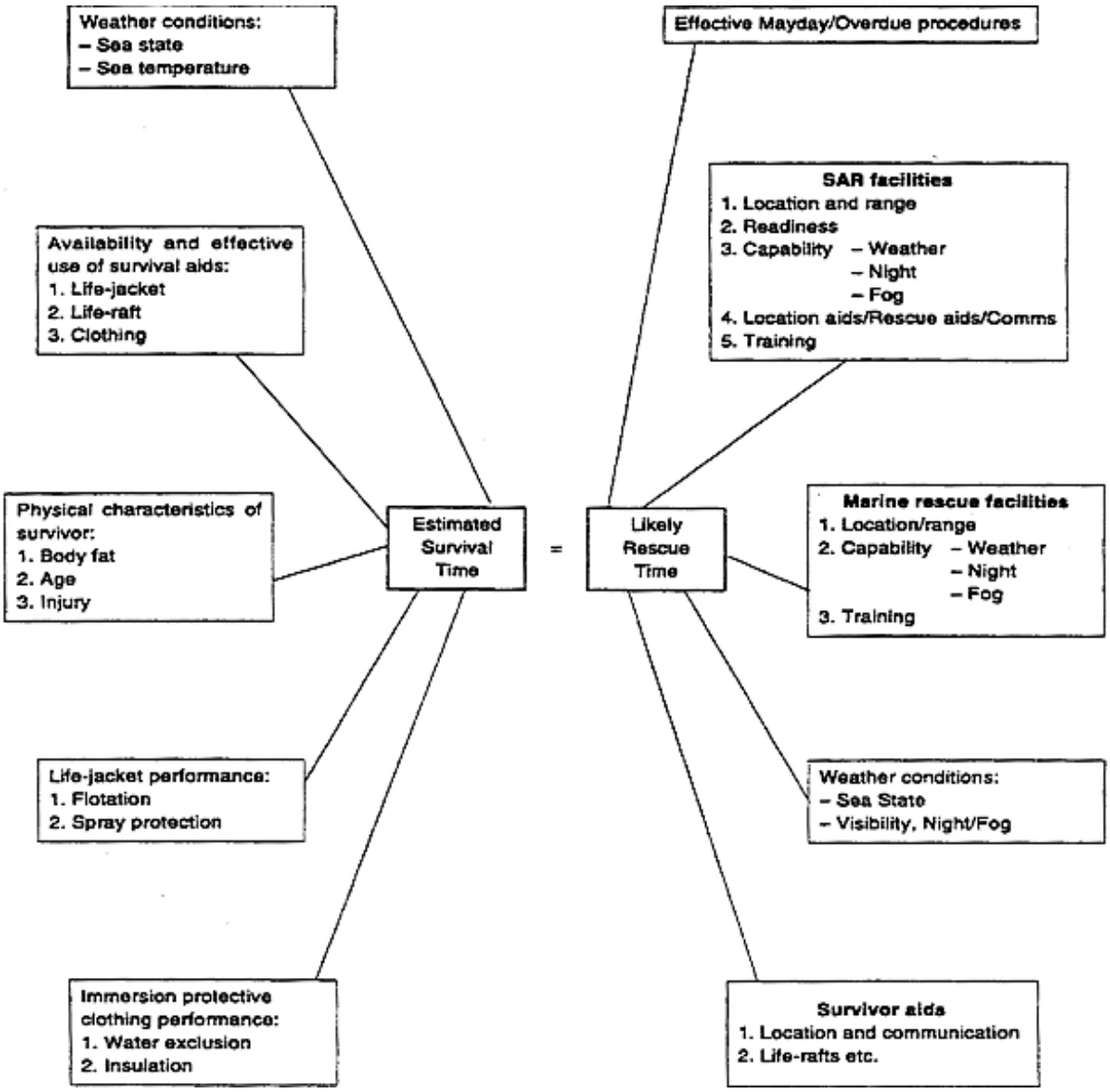
survival suit in addition to a life-jacket. By wearing the survival suit, he/she can slow down the rate which his/her body temperature falls and, consequently, protect himself/herself from the greater risk of drowning brought about by incapacitation due to hypothermia.

(2) The complete survival suit system – suit, life-jacket and clothes worn under the suit – should be able to keep the wearer alive long enough for the rescue services to find and recover him/her. In practice the limit is about 3 hours. If a group of persons in the water cannot be rescued within this time they are likely to have become so scattered and separated that location will be extremely difficult, especially in the rough water typical of Northern European sea areas. If it is expected that in water protection could be required for periods greater than 3 hours, improvements should, rather, be sought in the search and rescue procedures than in the immersion suit protection.

(b) Survival times

(1) The aim should be to ensure that a person in the water can survive long enough to be rescued, i.e. the survival time must be greater than the likely rescue time. The factors affecting both times are shown in Figure 1 below. The figure emphasises that survival time is influenced by many factors, physical and human. Some of the factors are relevant to survival in cold water and some are relevant in water at any temperature.

Figure 1: The survival equation



(2) Broad estimates of likely survival times for the thin individual offshore are given in Table 1 below. As survival time is significantly affected by the prevailing weather conditions at the time of immersion, the Beaufort wind scale has been used as an indicator of these surface conditions.

Table 1: Timescale within which the most vulnerable individuals are likely to succumb to the prevailing conditions.

Clothing assembly	Beaufort wind force	Times within which the most vulnerable individuals are likely to drown	
		(water temp 5°c)	(water temp 13°c)
Working clothes (no immersion suit)	0 – 2	Within ¾ hour	Within 1 ¼ hours
	3 – 4	Within ½ hour	Within ½ hour
	5 and above	Significantly less than ½ hour	Significantly less than ½ hour
Immersion suit worn over working clothes (with leakage inside suit)	0 -2	May well exceed 3 hours	May well exceed 3 hours
	3 – 4	Within 2 ¾ hours	May well exceed 3 hours
	5 and above	Significantly less than 2 ¾ hours. May well exceed 1 hour	May well exceed 3 hours

(3) Consideration should also be given to escaping from the helicopter itself should it submerge or invert in the water. In this case escape time is limited to the length of time the occupants can hold their breath. The breath holding time can be greatly reduced by the effect of cold shock. Cold shock is caused by the sudden drop in skin temperature on immersion, and is characterised by a gasp reflex and uncontrolled breathing. The urge to breathe rapidly becomes overwhelming and, if still submerged, the individual will inhale water resulting in drowning. Delaying the onset of cold shock by wearing an immersion suit will extend the available escape time from a submerged helicopter.

(4) The effects of water leakage and hydrostatic compression on the insulation quality of clothing are well recognised. In a nominally dry system the insulation is provided by still air trapped within the clothing fibres and between the layers of suit and clothes. It has been observed that many systems lose some of their insulative capacity either because the clothes under the 'waterproof' survival suit get wet to some extent or because of hydrostatic compression of the whole assembly. As a result of water leakage and compression, survival times will be shortened. The wearing of warm clothing under the suit is recommended.

(5) Whatever type of survival suit and other clothing is provided, it should not be forgotten that significant heat loss can occur from the head.

AMC1 CAT.IDE.H.300 Life-rafts, survival ELTs and survival equipment on extended overwater flights

LIFE–RAFTS AND EQUIPMENT FOR MAKING DISTRESS SIGNALS - HELICOPTERS

(a) Each required life-raft should conform to the following specifications:

(1) be of an approved design and stowed so as to facilitate their ready use in an emergency;

(2) be radar conspicuous to standard airborne radar equipment;

(3) when carrying more than one life-raft on board, at least 50 % should be able to be deployed by the crew while seated at their normal station, where necessary by remote control; and

(4) life-rafts that are not deployable by remote control or by the crew should be of such weight as to permit handling by one person. 40 kg should be considered a maximum weight.

(b) Each required life-raft should contain at least the following:

(1) one approved survivor locator light;

(2) one approved visual signalling device;

(3) one canopy (for use as a sail, sunshade or rain catcher) or other mean to protect occupants from the elements;

(4) one radar reflector;

(5) one 20 m retaining line designed to hold the life-raft near the helicopter but to release it if the helicopter becomes totally submerged;

(6) one sea anchor;

(7) one survival kit, appropriately equipped for the route to be flown, which should contain at least the following:

(i) one life-raft repair kit;

(ii) one bailing bucket;

(iii) one signalling mirror;

(iv) one police whistle;

(v) one buoyant raft knife;

(vi) one supplementary means of inflation;

(vii) sea sickness tablets;

(viii) one first-aid kit;

(ix) one portable means of illumination;

(x) 500 ml of pure water and one sea water desalting kit; and

(xi) one comprehensive illustrated survival booklet in an appropriate language.

AMC1 CAT.IDE.H.300(b)(3)&CAT.IDE.H.305(b) Flight over water & Survival equipment

SURVIVAL ELT

An ELT(AP) may be used to replace one required ELT(S) provided that it meets the ELT(S) requirements. A water-activated ELT(S) is not an ELT(AP).

AMC1 CAT.IDE.H.305 Survival equipment

ADDITIONAL SURVIVAL EQUIPMENT

(a) The following additional survival equipment should be carried when required:

(1) 500 ml of water for each 4, or fraction of 4, persons on board;

(2) one knife;

(3) first-aid equipment; and

(4) one set of air/ground codes.

(b) In addition, when polar conditions are expected, the following should be carried:

(1) a means for melting snow;

(2) one snow shovel and 1 ice saw;

(3) sleeping bags for use by 1/3 of all persons on board and space blankets for the remainder or space blankets for all passengers on board; and

(4) one arctic/polar suit for each crew member.

(c) If any item of equipment contained in the above list is already carried on board the helicopter in accordance with another requirement, there is no need for this to be duplicated.

GM1 CAT.IDE.H.305 Survival equipment

SIGNALLING EQUIPMENT

The signalling equipment for making distress signals is described in ICAO Annex 2, Rules of the Air.

GM2 CAT.IDE.H.305 Survival equipment

AREAS IN WHICH SEARCH AND RESCUE WOULD BE ESPECIALLY DIFFICULT

The expression 'areas in which search and rescue would be especially difficult' should be interpreted, in this context, as meaning:

(a) areas so designated by the authority responsible for managing search and rescue; or

(b) areas that are largely uninhabited and where:

(1) the authority referred to in (a) has not published any information to confirm whether search and rescue would be or would not be especially difficult; and

(2) the authority referred to in (a) does not, as a matter of policy, designate areas as being especially difficult for search and rescue.

AMC1 CAT.IDE.H.310 Additional requirements for helicopters operating to or from helidecks located in a hostile sea area

INSTALLATION OF THE LIFE-RAFT

(a) Projections on the exterior surface of the helicopter, that are located in a zone delineated by boundaries that are 1.22 m (4 ft) above and 0.61 m (2 ft) below the established static water line could cause damage to a deployed life-raft. Examples of projections that need to be considered are aerials, overboard vents, unprotected split-pin tails, guttering and any projection sharper than a three dimensional right angled corner.

(b) While the boundaries specified in (a) are intended as a guide, the total area that should be considered should also take into account the likely behaviour of the life-raft after deployment in all sea states up to the maximum in which the helicopter is capable of remaining upright.

(c) Wherever a modification or alteration is made to a helicopter within the boundaries specified, the need to prevent the modification or alteration from causing damage to a deployed life-raft should be taken into account in the design.

(d) Particular care should also be taken during routine maintenance to ensure that additional hazards are not introduced by, for example, leaving inspection panels with sharp corners proud of the surrounding fuselage surface, or allowing door sills to deteriorate to a point where sharp edges become a hazard.

GM1 CAT.IDE.H.315 Helicopters certificated for operating on water - Miscellaneous equipment

INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA

International Regulations for Preventing Collisions at Sea are those that were published by the International Maritime Organisation (IMO) in 1972.

AMC1 CAT.IDE.H.320(b) All helicopters on flight over water - ditching

GENERALThe same considerations of AMC1 CAT.IDE.H.310 should apply in respect of emergency flotation equipment.

AMC1 CAT.IDE.H.325 Headset

GENERAL

(a) A headset consists of a communication device that includes two earphones to receive and a microphone to transmit audio signals to the helicopter's communication system. To comply with the minimum performance requirements, the earphones and microphone should match the communication system's characteristics and the cockpit environment. The headset should be adequately adjustable in order to fit the pilot's head. Headset boom microphones should be of the noise cancelling type.

(b) If the intention is to utilise noise cancelling earphones, the operator should ensure that the earphones do not attenuate any aural warnings or sounds necessary for alerting the flight crew on matters related to the safe operation of the helicopter.

GM1 CAT.IDE.H.325 Headset

GENERAL

The term 'headset' includes any aviation helmet incorporating headphones and microphone worn by a flight crew member.

AMC1 CAT.IDE.H.345 Communication and navigation equipment for operations under IFR or under VFR over routes not navigated by reference to visual landmarks

TWO INDEPENDENT MEANS OF COMMUNICATION

Whenever two independent means of communication are required, each system should have an independent antenna installation, except where rigidly supported non-wire antennae or other antenna installations of equivalent reliability are used.

AMC2 CAT.IDE.H.345 Communication and navigation equipment for operations under IFR or under VFR over routes not navigated by reference to visual landmarks

ACCEPTABLE NUMBER AND TYPE OF COMMUNICATION AND NAVIGATION EQUIPMENT

(a) An acceptable number and type of communication and navigation equipment is:

(1) two VHF omnidirectional radio range (VOR) receiving systems on any route, or part thereof, where navigation is based only on VOR signals;

(2) two automatic direction finder (ADF) systems on any route, or part thereof, where navigation is based only on non-directional beacon (NDB) signals; and

(3) area navigation equipment when area navigation is required for the route being flown (e.g. equipment required by Part-SPA).

(b) The helicopter may be operated without the navigation equipment specified in (a)(1) and (a)(2) provided it is equipped with alternative equipment. The reliability and the accuracy of alternative equipment should allow safe navigation for the intended route.

(c) VHF communication equipment, instrument landing system (ILS) localiser and VOR receivers installed on helicopters to be operated under IFR should comply with the following FM immunity performance standards:

(1) ICAO Annex 10, Volume I - Radio Navigation Aids, and Volume III, Part II - Voice Communications Systems; and

(2) acceptable equipment standards contained in EUROCAE Minimum Operational Performance Specifications, documents ED-22B for VOR receivers, ED-23B for VHF communication receivers and ED-46B for LOC receivers and the corresponding Radio Technical Commission for Aeronautics (RTCA) documents DO-186, DO-195 and DO-196.

AMC3 CAT.IDE.H.345 Communication and navigation equipment for operations under IFR or under VFR over routes not navigated by reference to visual landmarks

FAILURE OF A SINGLE UNIT

Required communication and navigation equipment should be installed such that the failure of any single unit required for either communication or navigation purposes, or both, will not result in the failure of another unit required for communications or navigation purposes.

GM1 CAT.IDE.H.345 Communication and navigation equipment for operations under IFR or under VFR over routes not navigated by reference to visual landmarks

APPLICABLE AIRSPACE REQUIREMENTS

For helicopters being operated under European air traffic control, the applicable airspace requirements include the Single European Sky legislation.

AMC1 CAT.IDE.H.350 Transponder

SSR TRANSPONDER

(a) The secondary surveillance radar (SSR) transponders of aircraft being operated under European air traffic control should comply with any applicable Single European Sky legislation.

(b) If the Single European Sky legislation is not applicable, the SSR transponders should operate in accordance with the relevant provisions of Volume IV of ICAO Annex 10.