European Aviation Safety Agency

Comment Response Document (CRD) to Notice of Proposed Amendment (NPA) 2009-02b

for an Agency Opinion on a Commission Regulation establishing the Implementing Rules for air operations of Community operators

and

draft Decision of the Executive Director of the European Aviation Safety Agency on Acceptable Means of Compliance and Guidance Material related to the Implementing Rules for air operations of Community operators

"Part-OPS"

CRD c.7 – Comment Response Summary Table (CRST) CAT.IDE

Scope

This CRST document shows summaries of comments received and responses to the NPA text of Subpart A Section IV and Subpart B Section IV.

Column A: displays the NPA rule version

Column B: provides a summary of comments received, which have been coded as follows:

MS: Member State

INDUS: industry sector

INDIV: individual

Column C: provides the responses, justifying the reasons for changing or retaining the NPA text.

Table of Contents

A: Rule	B: Summary of comments	C: Reason for change, remarks
SUBPART A - SECTION IV - INSTRUMENTS, DATA AND EQUIPMENT	1. (MS: 0; INDUS: 10; INDIV: 0) As this subparts directly affects configuration and thus has economic impact, this NPA should literally transpose the content of JAR / EU - OPS 1. Any deviations to the existing JAR / EU - OPS Subpart K and L requirements should be specifically highlighted in a RIA 2. (MS: 1; IND: 0; INDIV: 0) This subpart is applicable to all aircraft, whatever the date of issuance of the first individual certificate of airworthiness might be. This is a huge difference compared to ICAO Annex 6 provisions and to EU/JAR-OPS 1/3 as well as to national rules (e.g. harnesses, TAWS, …). The question of cost/benefit of the retrofit must be studied carefully, especially in the case of general aviation or aerial work where situations can be different according to the Member States rules, as the only common basis (ICAO Annex 6-2) may either be a simple recommendation or a standard that takes into account the date of issuance of the first individual certificate of airworthiness. 3. (MS: 1; IND: 0; INDIV: 0) (H) In JAR-OPS 3, there used to be one section dealing with the equipment needed and another section dealing with operational procedures. In IR OPS everything is mixed and makes things difficult to understand (ex: oxygen, CVR and FDR- see OPS.GEN.510)	1. The content of EU-OPS 1 and TGL 44 (formerly section 2 of JAR-OPS 1) and JAR-OPS 3 have been taken into account in the drafting of the new proposed rule text. 2. Appropriate transition periods will be established in order to enable smooth implementation of the operations rules affecting installation of additional equipment. When establishing the transition periods for certain equipment, account is taken of the comments made to the provision, any ICAO compliance dates as well as EU legislation that may address an issue already partly, e.g. within the SES framework. The present proposal is based on EU-OPS and compliance dates have not been changed. New elements introduced are the provision of data link recording and upper torso restraint for aircraft with an MTOM of less than 5 700 kg. The compliance dates were established taking account of the elements above. 3. (H) Procedure requirements associated with the installation requirement were put together in section IV to facilitate their identification. Transfer of operational procedures into operational procedure section of the rules has been however performed, when relevant.
OPS.GEN.400 Instruments and equipment – General		
GENERAL OBJECTIVES		
(a) An aircraft shall be equipped with instruments which will enable the flight crew to:		1. This ICAO performance-based rule is very generic and may be difficult to implement. Furthermore, this rule may be seen as a duplication of the paragraph 5 Instruments, data and equipment of Annex IV to Regulation (EC) No 216/2008 that this Section implements.

A: Rule	B: Summary of comments	C: Reason for change, remarks
		The various instruments, data and equipment that are required by this Section IV shall suffice to ensure Essential Requirements are complied with. In order to avoid duplication of the Essential Requirements, paragraph (a) is proposed to be deleted.
(1) control or, in the case of balloons, determine the flight path;		
(2) carry out any required procedural manoeuvre; and		
(3) observe the operating limitations in the expected operating conditions.		
APRROVED AND NON-APPROVED EQUIPMENT		
(b) Equipment and instrument required by Part-OPS shall be approved, except as specified in (c), and installed in accordance with Part-21.	1. (MS: 0; IND: 11; INDIV: 0) This requirement and the full reference to Part-21 is not in line with EU-OPS 1.630 which refers to ETSO standard but also includes certain alleviations from this requirement in particular for equipment and instruments complying with design and performance specifications other than ETSO on the date of EU-OPS implementation Proposal: Realign with EU-OPS 1.630 including all the alleviations and grandfather rights from EU-OPS. 2. (MS: 1; IND: 0; INDIV: 0) Approval shall be also required for equipment that is used to perform a function required by Part-OPS. 3. (MS: 1; IND: 0; INDIV: 0) The approval of equipment shall not be required if "deemed not practical"[1]	1. The reference to approval in accordance with Part-21 is considered sufficient. Indeed the Part-21 allow approval in line with existing ETSO or with specifications recognized as equivalent by the Agency in a particular case (21A.305). 2. The equipment approval may include the intended function. 3. The exceptions are listed in revised paragraph (a).

[1] **Replace § OPS.GEN.400 (b) and add a (d)** as follows:

"(b) Equipment and instrument required by Part-OPS **or used to perform a function required by Part-OPS** shall be approved, except as specified in (c) **or if deemed not practical**, and installed in accordance with Part-21.

[…]

(d) Instruments and equipment not required by Part-OPS or not used to perform a required function, shall comply with the following:

1) if installed, the instrument/equipment shall comply with Part-21.

A: Rule	B: Summary of comments	C: Reason for change, remarks
(c) Instruments and equipment required by Part-OPS which do not need to be approved in accordance with Part-21, as well as any additional equipment which is not required by Part-OPS, but is carried on a flight, shall comply with the following:	1. (MS: 1; IND: 0; INDIV: 0) The requirement on equipment not required by this Part shall be separated from those on required equipment for clarity purpose 2. (MS: 1; IND: 0; INDIV: 0) All instruments and equipment on board of an aircraft should be approved according to Part-21. Reason: Airlines must demonstrate in accordance with Part-21 that all instruments and equipment shall not affect the airworthiness of the aircraft, even in the case of failures or malfunction	1. & 2. For clarity purpose paragraph (c) is revised to address equipment not required by this Part-OPS which do not need to be approved in accordance with Part-21. This will ensure that equipment or instruments that have not been subject to an approval in accordance with Part-21 are not used to comply with airworthiness and operations safety requirements.
(1) The information provided by these instruments, equipment or accessories shall not be used by the flight crew to comply with (a);	1. (MS: 0; IND: 0; INDIV: 1) These requirements will prevent the use of GPS devices not approved under Part-21 from being use for navigational purpose (e.g. glider competitions). It is proposed to amend the rule to state that the safe navigation of the aircraft must not be dependent on the use of unapproved instruments	1.The proposed rule ensures that compliance with Essential Requirements is not relying on non-approved equipment. If equipment are installed in addition to those required to comply with Essential Requirements, their utilisation is not precluded. 2.(RG) Class 1 EFB does not require an airworthiness approval because it's a non-installed equipment and therefore the paragraph (c)(1) is proposed to be modified not to preclude the use of EFB class 1 by referring to the specific requirements on navigation and communication for which subject equipment cannot be used for compliance.
(2) The instruments and equipment shall not affect the airworthiness of the aircraft, even in the case of failures or malfunction.		
ACCESSIBILITY AND POSITIONING OF INSTRUMENT AND EQUIPMENT		
(d) Instruments and equipment shall be readily operable or accessible from the station where the flight crew member that needs to use it is seated.	1. (MS: 0; INDUS: 1; INDIV: 0) Paragraph (d) states: "Instruments and equipment shall be readily operable or accessible from the sta-	1. The paragraph is changed to come back to EU-OPS text.

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2) if not installed, the instrument/equipment shall comply with (c)(1) and (c)(2)."

Justification: **To actually comply with OPS.GEN.400 (a)(1)(2)(3), it is not required that any equipment shall be approved. This would be inconsistent with GM2 OPS.GEN.400 (c).** Furthermore, some of the equipment in GM2 OPS.GEN.400 (c) do not meet the criteria of OPS.GEN.400 (a)(1).

A: Rule	B: Summary of comments	C: Reason for change, remarks
	tion where the flight crew member that needs to use it is seated." We recommend that this paragraph be reworded or eliminated. The location of equipment needing to be readily operable or accessible might require redesign and recertification of existing and approved locations of the emergency equipment. JUSTIFICATION: Paragraph (d) appears to be specifying design requirements for airplanes, which is inappropriate for an operational rule. It should be removed from this NPA.	
(e) Instruments and equipment used by flight crew members shall be arranged so as to enable them to see the indications for use readily from their station, with the minimum practicable deviation from the position and line of vision which they normally assume when looking forward along the flight path.	1. (MS: 0; INDUS: 1; INDIV: 0) The original intent of the rules was clearer in previous EU-OPS/JAR-OPS 3 texts. It is propose to come back to the initial text.	The paragraph is changed to come back to EU-OPS text.
(f) All required emergency equipment shall be easily accessible for immediate use.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
OPS.GEN.405 Equipment for all aircraft	1. (MS: 0; INDUS: 1; INDIV: 1) It is not clear why the previously single rule for seats, safety belts and harnesses has been divided between a number of rules (GEN.405, GEN.480 GEN.545, CAT.406 and CAT.482); it might be more appropriate to put all of the elements concerned with seats into a single rule in GEN.480. 2. (MS:2; INDUS: 0; INDIV: 0) The below requirements are design requirements that should not be included in OPS rules. 3. (MS: 1; INDUS:2; INDIV: 0) Our comment is to highlight the different terms used between "safety belt with shoulder harness", "safety harness", "safety belt with diagonal shoulder strap" since it may cause confusion. Our understanding is that a "safety belt with shoulder harness" equals a "safety belt with diagonal shoulder strap" because the word harness is singular (plural is harnesses). Clarification that "safety belt with shoulder harness" and "safety belt with diagonal shoulder strap" have only one band on the torso should be part of an AMC or GM. This AMC or GM should also provide some more clarification on what a "safety harness" is compared to the two other terms	1. For clarification of presentation of the requirements: - OPS.GEN.405 (a) (3) and (e) (2) on seat belts and harnesses to be moved into a common paragraph for harnesses and child restraint devices - OPS.GEN.405 (a)(2) and (e) to be moved into a common paragraph for harnesses and child restraint devices A dedicated rule for hand fire extinguisher is created incorporating OPS.GEN.405 (a)(1) and (b). 2.Requirements in line with EU-OPS & JAR-OPS 3 3.To clarify the terminology used, in accordance with ICAO Annex 6 Part III 4.12, only the term "safety harness". A definition is added. It may be considered if 'safety harness' could be replaced by 'upper torso restraint'. Further explanation is provided in the explanatory note.
AEROPLANES AND HELICOPTERS		
(a) Aeroplanes and helicopters shall be equipped with:		
(1) except in the case of aerobatic flights, at least one hand fire extinguisher:		1. Wording changed in line with EU-OPS.
(i) in the cockpit; and		
(ii) in each passenger compartment which is separate from the cockpit;		1.Reference to cargo compartment classes is introduced in line with EU-OPS.
(2) a seat or berth for each person older than 24 months;		1. Clarification of the wording, consistent with other paragraphs.

A: Rule	B: Summary of comments	C: Reason for change, remarks
(3) a seat belt for each seat and restraining belts for each berth;	1. (MS: 0; INDUS: 1; INDIV: 0) (H)(SPO) For some heliborne operations (e.g. human external cargo operations) workers don't necessary have a seat or a berth. Proposal is to add: "Except for specific aerial works approved by the authority,	1. The comment is taken into account for SPO.IDE 2. "passenger" is added before "seat" in order to avoid duplication of requirements with safety harness on flight crew member seats.
(4) a restraint device for each person younger than 24 months; and	1. (MS: 0; INDUS: 0; INDIV: 1) A baby in an incubator cannot be provided with a restraint device 2. (MS: 0; INDUS: 0; INDIV: 1) The proposed text says restraint device for each person younger than 24 months but does not give any indication on where the infant should sit or if double occupancy is permitted. 3. (MS: 0; INDUS: 0; INDIV: 1) Replace "a restraint device" by "a child restraint device (CRD)". This will make the link with the AMC more understandable.	1. The AMC is providing several means of compliance. In this specific case, an alternate means of compliance may be proposed to the NAA and could eventually be published as an AMC to this rule. 2. The text transposes EU-OPS/JAR-OPS 3. The issue of double occupancy is regulated in CAT.OP, as was the case in EU-OPS/JAR-OPS 3. Furthermore, the issue will be further addressed in a future rulemaking task. 3. Reference to child restraint device clarified in line with AMC.
(5) spare electrical fuses, of the ratings required for complete circuit protection, for replacement of those fuses that are accessible in flight.	1. (MS: 0; INDUS: 1; INDIV: 0) The requirement shall apply only for fuses which are required for the correct operation of instruments and equipment required by Part-OPS and 2. (MS: 0; INDUS:2; INDIV: 0) ERA members feel that accessibility is not the criteria. As NPA OPS 43 was not approved and was just a draft the criteria should be "for use". Therefore please change sub-paragraph 5 to read: (5) Spare electrical fuses, of the ratings required for complete circuit protection, for replacement of those fuses that are allowed to be changed in flight.	1. & 2. In order to address the output of NPA OPS 43 the requirement is clarified in order to cover the intent of purpose. 3. (H) This rule is not today applicable to helicopters used in Europe, as far identified. However the rule is introduced for consistency with ICAO.
(b) The type and quantity of extinguishing agent for the required fire extinguishers shall be suitable for the type of fire likely to occur in the compartment where the extinguisher is intended to be used and the hazard of toxic gas concentration in compartments occupied by persons shall be minimised.	1. (MS: 1; INDUS: 0; INDIV: 0) The use of Halon as a fire extinguisher should be addressed in the IR not only in the AMC. Justification: as of today, Halon is the only efficient extinguishing agent. New agents are in the process of being developed by the industry for hand extinguishers. For cargo and engine automatic extinguishers, though, no other agent has been developed so far. As there are	1. Not accepted. EC 1005/2009 regulation will forbid the use of Halon

A: Rule	B: Summary of comments	C: Reason for change, remarks
	discussions at European level on the topic, for environment concerns, which may impose in a EU regulation the end of the special exemption for aviation, we fear that having the possibility to use Halon in a simple AMC will make that provision not usable, as it will be outweighed by the EU regulation. This might cause safety concerns.	
	2. EASA should keep the transition period as long as a suitable successor is available for the airline industry.	2. Provision was drafted sufficiently open to account of any transition period or prohibition that might be decided by the Commission.
SAILPLANES		
(c) Sailplanes shall be equipped in accordance with (a)(2) and (a)(3).		
BALLOONS		
(d) Balloons shall be equipped in accordance with (a)(1)(i) and an alternative source of ignition.		
LARGE BALLOONS AND BALLOONS INVOLVED IN COMMERCIAL OPERATIONS		
(e) Balloons with a maximum passenger capacity of more than 11 and balloons used in commercial operations shall, in addition to (d), be equipped with:		
(1) protective gloves for each crew member;		
(2) crew restraint harness(es);		
(3) a hook knife;		
(4) a fire blanket or fire resistant cover; and		
(5) a drop line of at least 30 metres (m).		
CARRIAGE OF PARACHUTISTS		

A: Rule	B: Summary of comments	C: Reason for change, remarks
(f) Notwithstanding the provisions of (a)(2), in the case of carriage of parachutists, the floor may be used as a seat, provided means are available for the parachutists to hold on.		
OPS.GEN.410 Flight instruments and equipment - VFR flights		
SAILPLANES, AEROPLANES AND HELICOPTERS		
(a) When operating under Visual Flight Rules (VFR), sailplanes, aeroplanes, and helicopters shall be equipped with a means of measuring and displaying:		
(1) magnetic heading;		1.“heading” is replaced by “direction” for consistency 2.AMC provides “magnetic compass” as a means of compliance
(2) time, in hours, minutes and seconds;	1. (MS: 1; INDUS: 0; INDIV: 0) For a VFR flight, there is no need for precision down to the nearest second. Hours and minutes are enough. 2. (MS: 1; INDUS: 0; INDIV: 0) Delete “shall be equipped with”. Justification: A requirement for time piece equipment could be subject to an installation, which could be very costly.	1. Not accepted. The requirement for seconds is in line with ICAO. 2. Not accepted. The AMC OPS.GEN.410(a)(2) allows for showing compliance with a wrist watch for other than complex motor-powered aircraft.
(3) pressure altitude; and		
(4) indicated air speed.		
(b) When sailplanes, aeroplanes and helicopters operating under VFR cannot be maintained in a desired attitude without reference to one or more flight instruments, it shall, in addition to those required in (a), be equipped with a means of measuring and displaying:	1. (MS: 1; INDUS: 0; INDIV: 0) This paragraph details the required flight instruments and equipment for various flight regimes. The matter is complex due to the varying requirements of the different types of operation, the flight conditions and the time of day. There is a need to specify the types of flight conditions for which additional instruments shall be installed. See proposal.	1.– 7.The requirements on instruments for VFR and IFR are revised in line with current EU-OPS/JAR-OPS 3 content for aeroplanes and helicopters CAT operations. This paragraph was based on ICAO 2.4.7 interpretation that the additional instruments necessary to fulfil the Essential Requirements may vary depending on the operational conditions. A revised version of paragraph (b), with more specific conditions of applicability is however maintained for the NCC & NCO rules.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	2. (MS: 1; INDUS: 1; INDIV: 0) As written, "cannot be maintained in a desired attitude" refers to a concept of "IMC rating", which is not applicable, even considered as illegal, in other European countries. There is no certainty on what operational conditions it corresponds to.	
	3. (MS: 1; INDUS: 0; INDIV: 0) The LBA requests to stay away from the performance base rule making here. If this system shall be used, OPS.GEN 405 should be phrased in a similar way. However, this does not make much sense at all.	
	4. (MS: 1; INDUS: 0; INDIV: 0) Move (b)(1) and (b)(2) to OPS.GEN.410 (a) to read: "(5) vertical speed only for sailplanes"; "(6) turn and slip for aeroplanes and slip for helicopters". Justification: these items are necessary for VFR with sailplanes, aeroplanes and helicopters	
	5. (MS: 0; INDUS: 0; INDIV: 1) The listed equipment for sailplanes unable to maintain attitude without reference to flight instruments conflicts with the regulations for certification by setting a different requirement. In particular for the stabilised direction indicator.	
	6. (MS: 0; INDUS: 12; INDIV: 14) The set of rules for instruments VFR, night VFR and IFR are made extremely complex by the policy of inheritance. The combination of rules has to provide for simple types and complex types in General Aviation; it must also cater for simple types and complex types in Commercial Air Transport; and simple and complex types in commercial and non-commercial Aerial Work. The criteria for instruments and equipment vary for simple types within GA, CAT and AW and also for complex types in GA, CAT and AW. There are also differences between: single pilot and two pilots; operations when control can be maintained by reference outside the cockpit and those where it cannot - even though all of these are designated as VFR (and	

A: Rule	B: Summary of comments	C: Reason for change, remarks
	even further complicated by the inheritance from VFR to IFR). Proposal	
	7. (MS: 1; INDUS: 0; INDIV: 0) A VFR-flight is by definition a flight when the attitude is maintained by visual references out of the cockpit and in VMC. We do not agree to a need of additional instruments during operations in VFR/VMC, where the desired attitude not can be maintained to one or more instruments. Only a need can be seen for VSI during night and a DG during VFR on top.	
(1) vertical speed;		
(2) turn and slip for aeroplanes, and slip for helicopters;	1. (MS: 0; INDUS:30; INDIV: 10) (H) It is proposed to write: (iii) turn and slip for aeroplanes; and slip for helicopters; Reason: it has to be clear that only the display of slip is required for helicopters. 2. (MS: 0; INDUS: 1; INDIV: 0) Modern aircraft with glass cockpit does not always have turn and slip indicators. The rule should be modified in order to also allow modern glass cockpit aircraft accordingly. I.e. Garmin 1000 glass cockpit.	1. (H) The requirements are now separated in different sections. 2. The requirement is on the displaying of the slip indication. This requirement can be met by acceptable means of compliance such as combinations of instruments or by integrated flight systems or by combination of parameters on electronic displays provided the information so available to each required pilot is equivalent.
(3) attitude. In the case of helicopters, two separate means of indicating attitude shall be available;	1. (MS: 0; INDUS:3; INDIV: 0) (H) For VFR flight in a helicopter, even a single AI is not of any real use, having two will not make flying safer. A second indicator would be very expensive to fit, around £4 000 for a typical piston helicopter and there will likely not be a panel aperture spare for this extra instrument. This is not an ICAO recommendation and there is no reason to believe that safety is increased by this recommendation.	1. (H) The text is aligned with JAR-OPS 3.
	What are the "two separate means of indicating attitude"? Does it mean two instruments or two different types of instruments? Specify in the AMC how to comply with this requirement. Flights under VFR which cannot be maintained in a desired attitude without reference to one or more	

A: Rule	B: Summary of comments	C: Reason for change, remarks
	flight instruments are typically flights over calm water.	
	OPS.CAT.410(b) already requests, in addition to OPS.GEN.410, one attitude indicator for flights over water. The proposal is so: one attitude indicator in GEN + 1 attitude indicator for commercial air transport over water. It would not realistic to request 3 attitude indicators for CAT over water.	
	This is not required neither by CS-27 nor CS-29. A standby AI is required only by Appendix B (Airworthiness criteria for helicopter instrument flight) to CS-27/29. Similarly JAR-OPS 3.650 (Day VFR Ops) did not require a second AI. A standby AI is required by JAR-OPS 3.652 (IFR or night ops).	
	ICAO Annex 6 Part III Ch.4 Para 4.4.1 prescribes a second AI for night ops. This rule seems to be more conservative than ICAO SARP, JAR-OPS 3 and the airworthiness Rules that are the basis for granting a type certificate. Additionally compliance to OPS.GEN.410I seems to require 4 AIs. OPS.GEN.410(b)(5) is incomplete.	
(4) stabilised heading; and		2. Wording changed from "heading" to "direction" for consistency with EU-OPS & airworthiness codes.
(5) when power is not adequately supplied to the instruments.	1. (MS: 0; INDUS: 1; INDIV: 1) None of the instruments listed in OPS.GEN.410 (a) has a need of external power; suggest this point can be deleted. How can we measure when power is not adequately supplied to the instruments? Also on some a/c, no power is needed for vertical speed required by §(b)(1) - only air pressure is enough - so §(b)(5) cannot be complied with. Proposal is to keep this requirement but not under §(b)(5), under a new (c) for example, and also to exempt vertical speed from this requirement.	1. It is proposed to clarify the requirement by "whether the supply of power to the gyroscopic instruments is adequate" in line with ICAO Annex 6 Part II Chapter 2.4.7 a) 8). Moved to dedicated paragraphs applicable to each aircraft type when heading/attitude is required (see below).

A: Rule	B: Summary of comments	C: Reason for change, remarks
AEROPLANES AND HELICOPTERS IN MULTI-PILOT OPERATIONS		
(c) Whenever two pilots are required for the operation, aeroplanes and helicopters shall be equipped with an additional separate means of indicating (a)(3), (a)(4), (b)(1), (b)(2), (b)(3) and (b)(4).		
BALLOONS		
(d) When operating under VFR, balloons shall be equipped in accordance with (a)(2), (a)(3) and also with:		
(1) a means of indicating:		
(i) drift direction; and		
(ii) envelope temperature; and		
LARGE BALLOONS AND BALLOONS INVOLVED IN COMMERCIAL OPERATIONS		
(e) Balloons with a maximum passenger capacity of more than 11 and balloons used in commercial operations, when operating under VFR shall, in addition to (d), be equipped with:		
(1) a means of measuring and displaying:		
(i) vertical speed; and		
(ii) pressure for each supply line;		
OPS.GEN.415 Flight instruments and equipment - VFR night flights and IFR flights		
AEROPLANES AND HELICOPTERS		
(a) Aeroplanes and helicopters operating Visual Flight Rules (VFR) night flights and Instrument Flight Rules (IFR) flights shall, in addition to complying with OPS.GEN.410(a), (b), and (c), be equipped with:		

A: Rule	B: Summary of comments	C: Reason for change, remarks
(1) a means of measuring and displaying outside air temperature;	1. (MS: 0; INDUS:30; INDIV: 10) A second outside air temperature gauge is not required for helicopters or even aeroplanes (one has always been the requirement). It is usually located in the centre of the windscreen. 2. (MS: 0; INDUS: 1; INDIV: 0) Measuring would insinuate a probe to directly measure the OAT while often the OAT (in the form of SAT) is derived from TAT and airspeed or Mach number.	1. The requirements are now separated in different sections. 2. Requirement is limited to means of displaying leaving flexibility on the means of compliance in line with EU-OPS 1.650.
(2) a means of preventing malfunction due to either condensation or icing for the means of measuring and displaying indicated air speed;		
(3) an alternative source of static pressure;		1.The requirement is clarified and exception for propeller-driven aeroplanes is introduced in line with EU-OPS.
(4) an anti-collision light system;	1. (MS: 0; INDUS: 1; INDIV: 0) (H) Because anti-collision light system for helicopters already occurs in CAT.410; it appears to be a double requirement.	1.(H) This issue is corrected with the new presentation of the rules.
(5) navigation/position lights;		
(6) a landing light;		
(7) lighting supplied from the aircraft's electrical system to provide adequate illumination for all instruments and equipment essential to the safe operation of the aircraft;		
(8) lighting supplied from the aircraft's electrical system to provide illumination in all passenger compartments;		
(9) an electric torch for each crew member station;		
(10) lights to conform with International Regulations for Preventing Collisions at Sea (hereinafter referred to as International Regulations for Preventing Collisions at Sea) if the aircraft is amphibious; and	1. (MS: 0; INDUS: 1; INDIV: 0) Lack of clarity of the requirement. It is proposed to align with EU-OPS wording	1. Clarification of the requirement in line with EU-OPS/JAR-OPS 3.
(11) in the case of aeroplanes with speed limitations expressed in terms of Mach number, a means of indicating Mach number.		1.Wording is clarified

A: Rule	B: Summary of comments	C: Reason for change, remarks
(b) Aeroplanes operating VFR night flights and IFR flights and helicopters operating IFR flights shall be equipped with a chart holder in an easily readable position which can be illuminated for night operations.		
SAILPLANES		
(c) Sailplanes operating VFR night flights or IFR flights, shall comply with (a) (4) to (10) inclusive.		
BALLOONS		
(d) Balloons operated at night shall, in addition to complying with OPS.GEN.410(d) and (e), as applicable, be equipped with:		
(1) position lights; and		
(2) a means of illuminating all of the instruments used by the flight crew.		
OPS.GEN.420 Flights over water		
SAILPLANSE AND BALLOONS		
(a) The pilot-in-command of a sailplane or balloon shall determine the risks to survival of the occupants of the aircraft in the event of a ditching, based on which he/she shall determine the carriage of:		
(1) life jackets, or equivalent floatation devices, for each person on board, stowed in a position which is readily accessible from the seat or berth of the person for whose use it is provided;		
(2) emergency locator transmitters; and		
(3) equipment for making distress signal,		
when operating a flight:		
(i) over water beyond gliding distance from the shore; or		
(ii) where the take-off or approach path is so disposed over water that in the event of a mishap there would be a likelihood of ditching;		

A: Rule	B: Summary of comments	C: Reason for change, remarks
LANDPLANES		
(b) Landplanes shall be equipped with (a)(1) when:		
(1) flying over water beyond gliding distance from the shore; or		
(2) taking off or landing at an aerodrome or operating site where, in the opinion of the pilot-in-command, the take-off or approach path is so disposed over water that in the event of a mishap there would be a likelihood of a ditching.		
SEAPLANES		
(c) When flying over water, seaplanes shall, in addition to (a)(1),be equipped with:		
(1) equipment for making the sound signals, as prescribed by the International Regulations for Preventing Collisions at Sea;		
(2) one anchor; and		
(3) one sea anchor (drogue), when necessary to assist in manoeuvring.		
AEROPLANES		
(d) The pilot-in-command of an aeroplane operated at a distance away from land where an emergency landing is possible greater than that corresponding to:		
(1) 120 minutes at cruising speed or 400 nautical miles (nm), whichever is the lesser, in the case of aeroplanes capable of continuing the flight to an aerodrome with the critical power unit(s) becoming inoperative at any point along the route or planned diversions; or		
(2) 30 minutes at cruising speed or 100 nm, whichever is the lesser, for all other aeroplanes,		
shall determine the risks to survival of the occupants of the aeroplane in the event of a ditching, based on which he/she shall determine the carriage, in addition to (b) or (c) and (a)(3), of:		
(i) life-saving rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency; and		1. (H) The criteria of JAR-OPS 3.830 (11 persons) are incorporated.

A: Rule	B: Summary of comments	C: Reason for change, remarks
(ii) life-saving equipment, including means of sustaining life, as is appropriate to the flight to be undertaken.		
HELICOPTERS		
(e) Helicopters shall be equipped with (a)(1), when operated in:		
(1) Performance Class 1 or 2 on a flight over water at a distance corresponding to more than 10 minutes flying time at normal cruising speed;	1. (MS: 0; IND: 1; INDIV: 0) (H) The distance shall be referenced from/to the land. 2. (MS: 1; IND: 1; INDIV: 1) (H) All distances stated as time "from land" should be exchanged with "to land". This since a strong wind from land would carry an aircraft further from land and result in greater distance to land. Furthermore, if the return heading towards land results in a headwind the time to reach land will increase. This scenario would produce a lower level of safety level than anticipated.	1. (H) Editorial change for clarification purpose. 2. (H) "From land" is conventional terminology that is used also across ICAO Annex 6. Although the comment is valid, it is expected that the interpretation of the rule as written by operators will account for the potential wind effects.
	3. (H) The requirement is more stringent. Flight to Helgoland can in accordance with the proposed requirement only be performed with helicopters fully certified and equipped. The HEMS flights should be excluded from the requirement.	3. (H) The proposed rule is compliant with JAR-OPS 3.825.
(2) Performance Class 3 on a flight over water beyond autorotational distance from the land; or	1. (MS:; IND:3; INDIV)(H) OPS.GEN.420 (e)(2) uses the wording "beyond autorotational distance from land" while OPS.GEN.425.H § (b)(2) uses the wording: "beyond a safe forced landing distance from land". Proposal: the terms shall be harmonized.	1/(H) The terms "autorotational distance" or "safe forced landing distance" have different definitions and are introduced in the requirements on purpose.
(3) Performance Class 2 or 3 when taking off or landing at an aerodrome/operating site where the take-off or approach path is over water.	1. (e) (3) Delete § and move it to Part CAT.	1. Accepted
(f) When operated in Performance Class 1 or 2 on a flight over water at a distance corresponding to more than 10 minutes flying time at normal cruising speed or in Performance Class 3 on a flight over water at a distance corresponding to more than three minutes flying time at normal cruising speed, helicopters shall, in	1. (MS:; IND:3; INDIV:) Because there are a number of complicated conditions in (d), the requirement should be spelled out	1. Requirement is revised in line with JAR-OPS 3.

A: Rule	B: Summary of comments	C: Reason for change, remarks
addition to (a)(1), and when not precluded by considerations related to the type of helicopter used, be equipped with (a)(3) and (d).	here: "(f) ..., be equipped with (a)(3) and (d)(i) and (ii)." 2/ (MS: 1; IND:8; INDIV:38) Comments are against the propose rule because: 1. lack of proportionality for recreational and private helicopter flights 2. lack of space to accommodate the rafts in light helicopters 3. risk of inadvertent inflation 4. risk of adverse consequence when trying to deploy the raft. 5. UK CAA statistics shows better record for helicopters than for aeroplanes overwater (single engine aircraft). Recorded proposals are as follows: 1 The carriage of life-saving rafts is left at pilots' decision.	2. For CAT the text is aligned with JAR-OPS 3.
(g) The pilot-in-command of a helicopter operated in Performance Class 3 shall determine the risks to survival of the occupants of the helicopter in the event of a ditching, based on which he/she shall determine if the life jackets required in (e) shall be worn by all occupants.		
ALL AIRCRAFT		
(h) Each life jacket or equivalent individual flotation device, when carried in accordance with (b), (c), (d), (e), (f) or (g) shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons.		
OPS.GEN.425.H Ditching - Helicopters		
(a) Helicopters operated in Performance Class 1 or 2 on a flight over water in a hostile environment at a distance corresponding to more than 10 minutes flying time at normal cruising speed shall be:	1. (MS:2; IND: 11; INDIV:34) Comments are against the propose rule because: 1. there is no safety case for these proposals 2. these proposals would, effectively, prohibit heli-	1. The requirement of installation of floatation device on light helicopters with reduced passenger capacity for CAT is in line with JAR-OPS 3.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	copter flights over water without emergency floatation equipment 3. many helicopters cannot be fitted with floats 4. the cost of fitting floats is very high (price list provided by some commenters) - disproportionate to the risk.	
	5. There is a strong argument that ditching without floats is safer than ditching with floats. 6. Specific training for autorotation techniques with floats may be required. 7. The risk of uncommanded inflation can create more hazard than potential safety 8. Floats increase the operating costs and decrease the performance of helicopters - fuel efficiency is also reduced.	
	Recorded proposals are as follows: 1. the requirements for light helicopters should be the same as those for aeroplanes, or 2. to apply the requirements OPS.GEN.425.H (a) & (b) to CAT only (with AMC to require wearing lifejackets whilst more than 10 minutes' flying time to land), or	
	3. to apply the requirement OPS.GEN.425.H (a) to CAT only and only maintain OPS.GEN.425.H (b) for PC 1 & 2. 4. The decision is left to the private pilots' decision. 5. Compliance is achieved for private flights by wearing life-jackets whilst more than 10 minutes' flying time from land when operating over open water.	
(1) designed for landing on water; or		

A: Rule	B: Summary of comments	C: Reason for change, remarks
(2) certificated in accordance with ditching provisions in the relevant airworthiness code.		
(b) In addition, helicopters shall comply with (a) or be fitted with emergency flotation equipment when operated in:		
(1) Performance Class 1 or 2 on a flight over water in a non-hostile environment at a distance corresponding to more than 10 minutes flying time at normal cruising speed;		
(2) Performance Class 3 on a flight over water beyond a safe forced landing distance from land; or	1. (MS=0; INDUS=0; INDIV=1) HEMS flights shall be excluded from the rule. 2. (MS=1; INDUS=0; INDIV=0) Commercial air transport helicopters operating overwater in a hostile environment should be equipped with an automatic float deployment system. Introduce a new item in the CAT Section to cater for this.	1. The exception for HEMS performance Class 2 is included and reflects with JAR-OPS 3. 2. Not accepted The proposal should be subject to a new rulemaking task. (Ref. CAA Paper 2005-06)
(3) Performance Class 2 when taking off or landing over water, except in the case of Helicopter Emergency Medical Services (HEMS) operations, 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.		
OPS.GEN.430 Emergency Locator Transmitter (ELT)	1. (MS: 0; IND: 4; INDIV:7) The requirement should account for specific operations. Proposal is to reduce the scope to "operated in areas designated by Member States as those in which search and rescue would be especially difficult"	1. The requirements are in line with ICAO Annex 6 Part I
AEROPLANES		
(a) Aeroplanes first issued with an individual certificate of airworthiness before and including 1 July 2008 shall be equipped with an Emergency Locator Transmitter (ELT) of any type.	1. (MS:2; IND: 0; INDIV: 1) The ELT rule does not include the frequency requirement, asking for 121.5 and 406 MHz capability. This, however, is included in AMC OPS.GEN.430 No.2,	1. Accepted. The frequencies requirements are elevated to IR.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	which is not acceptable. 2. (MS: 1; IND: 0; INDIV: 0) Type shall be defined otherwise there will be different regulations in the Member States. 3. (MS: 0; IND: 1; INDIV: 0) It should possible to satisfy the ELT requirement by carrying a PLB (personal locator beacon) approved by Cospass Sarsat and coded for aviation use. 4 (MS: 0; IND: 0; INDIV: 1) If an ELT "of any type" is acceptable, is the aircraft "equipped" if an ELT(S) is carried by the pilot?	2. Types are defined in AMC. It was IEM in the JARs. 3. Exception to carry PLB for each person on board as an alternative to ELT will be investigated as part of the NCO rules. 4. As long as the ELT(S) and its installation is approved, the aircraft is considered equipped.
(b) Aeroplanes first issued with an individual certificate of airworthiness after 1 July 2008 shall be equipped with an automatic ELT.	1. (MS: 1; IND: 0; INDIV: 0) The requirement in Annex 10 Vol. V about the remote control in cockpit for ELT (in order to switch between OFF, ARM an ON) should be clarified in this paragraph or in an AMC.	1. The commentator is requested to submit a proposal to be included in a future rulemaking task.
HELICOPTERS		
(c) Helicopters shall be equipped with:		
(1) at least one automatic ELT; and	1. (MS: 0; IND: 4; INDIV:7) (H) The requirement should account for specific operations. Proposal is to reduce the scope to "operated in areas designated by Member States as those in which search and rescue would be especially difficult".	1. (H) The requirement on automatic ELT is in line with AJR-OPS 3
	2. (MS: 0; IND: 7; INDIV: 26) (H) Several arguments against the automatic ELT have been recorded: i) Automatic ELT gives priority to the aircraft and not	2. - 4. (H) The requirement on automatic ELT is in line with JAR-OPS 3. PLB is being considered for NCO rules.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	the passengers: 'Body or, Life Jacket worn' location device are the preferred solution. ii) Automatic ELT are not efficient in case of ditching. As the vast majority of controlled ditchings are reportedly survivable, survivors have to be rapidly located and recovered. This is not possible when the automatic ELT has sunk with the aircraft.	
	iii) Automatic ELT are not efficient in case of forced landing. Antennae under the fuselage are often ripped off. The impact forces experienced during a survivable light aircraft accident are thought to be below that required to activate an automatic ELT when compliant with ED-62 specifications. iv) GPS equipped PLB are more efficient than conventional ELT technology.	
	v) Fixed automatic ELT are expensive to install and maintain. The installation of a fixed ELT must be conducted as a minor modification approved in accordance with the Part M airworthiness standards. An automatic ELT would cost around €5 000 to install. A PLB can be purchased for around €300. Installation is not easy.	
	vi) There is no current UK CAA requirement for private non-commercial aircraft to be fitted with ELT. The UK CAA regulations only require a PLB or an ELT to be carried for flights longer than 10 minutes from land.	
	3. (MS: 0; IND: 2; INDIV: 16) (H) A hand-held ELB is a sensible precaution when flying over hostile terrain, particularly water, but it is neither necessary nor justified when flying over populated areas. It should be the pilot's discretion what equipment to carry on any given flight	
	4.(MS: 0; IND: 1; INDIV: 1) (H) Since the implications for survival after ditching are similar, irrespective of the class of aircraft flown, the disparities between the ICAO standards for aeroplanes and helicopters seem unjustified. If mandatory ELT fitment becomes law, the fixed	

A: Rule	B: Summary of comments	C: Reason for change, remarks
	wing requirements should apply to helicopters, including the pre July 1 2008 certificate of airworthiness provision.	
(2) one Survival ELT (ELT(S)) in a life-saving raft or life jacket when the helicopter is operated in:	1. (MS: 0; IND: 1; INDIV: 1) It is unnecessary to carry an additional ELT in the life-raft if the pilot already carries a portable one.	1. The requirement is aligned with JAR-OPS 3.830.
(i) Performance Class 1 or 2 on a flight over water at a distance corresponding to more than 10 minutes flying time at normal cruising speed; or		
(ii) Performance Class 3 on a flight over water at a distance corresponding to more than three minutes flying time at normal cruising speed.		
OPS.GEN.435 Survival equipment – Motor-powered aircraft		1. Exception introduced from OPS.GEN.435 in line with EU-OPS 1.835 (c).
ALL AIRCRAFT		
(a) Aircraft operated across areas in which search and rescue would be especially difficult shall be equipped with the following:	1. (MS: 0; IND: 0; INDIV: 1) According to the title of the paragraph applicability to MPA only shall be specified. 2. (MS: 0; IND: 0; INDIV: 1) Across areas in which SAR would be especially difficult' is open to interpretation, and therefore lacks legal certainty. Proposal; specify 'over areas designated by Member States as especially difficult for SAR'.	1. Applicability to MPA only is clarified. 2. The requirement is in line with EU-OPS. GM OPS.GEN.435 provides interpretative material. This applies to any airspace, also outside the territory of the EU.
(1) Signalling equipment to make distress signals;.	1. (MS: 0; IND: 0; INDIV: 1) If you fly over the alps you have to be equipped with signalling equipment. This will interfere with security regulations. If a pilot carries a signal device to his aircraft he will have problems with the police.	1. The requirement is in line with EU-OPS/JAR-OPS 3. We are not aware of conflict with security requirements.

A: Rule	B: Summary of comments	C: Reason for change, remarks
(2) At least one ELT (S); and		
(3) Additional survival equipment for the route to be flown taking account of the number of persons on board.		
AEROPLANES		
(b) Notwithstanding (a)(3), in the case of aeroplanes, the additional survival equipment specified in (a)(3) need not be carried when the aeroplane:		
(1) remains within a distance from an area where search and rescue is not especially difficult, that corresponds to:		
(i) 120 minutes at the one engine inoperative cruising speed for aeroplanes capable of continuing the flight to an aerodrome with the critical power unit(s) becoming inoperative at any point along the route or planned diversion routes; or		
(ii) 30 minutes at cruising speed for all other aeroplanes;		
or,		
(2) remains within a distance no greater than that corresponding to 90 minutes at cruising speed from an area suitable for making an emergency landing; in the case of a complex motor-powered aircraft certificated in accordance with the applicable airworthiness code issued by the Agency.	1. (MS: 0; IND: 1; INDIV: 0) The applicability of this paragraph to CMPA only is confusing as there is a "or" between (a) and (b)	1. This will be clarified by the revised organisation of the requirements.

A: Rule	B: Summary of comments	C: Reason for change, remarks
OPS.GEN.440 High altitude flights - Oxygen	1. (MS: 0; INDUS: 1; INDIV: 0): Editorial change: should be amended to read "High altitude flights - Supplemental oxygen". 2. (MS: 0; INDUS: 1; INDIV: 0): A/C in parachute operation are excepted. Up to the PIC to determine whether oxygen should be carried out on board or not.	1. The title is changed in line with EU/OPS JAR-OPS 3 2. No change - current proposal in line with ICAO.
ALL AIRCRAFT		
(a) Aircraft flying above altitudes at which the pressure altitude in the passenger compartments is above 10 000 ft (feet) shall carry enough breathing oxygen to supply:	1. (MS: 0; INDUS: 1; INDIV: 0): Editorial change proposed: "When an aircraft is operated such that the pressure altitude of the passenger compartment is above 10 000 ft, enough breathing oxygen should be carried to supply: [...]"	1. The requirement is clarified in line with EU-OPS. EU-OPS 1.770 (a) (2) & (3) in AMC.
	2. (MS: 0; INDUS: 15; INDIV: 11) (H): Alleviation, approved by NAA, for short periods up to 16 000 ft shall be possible based on the kind of work, and the training of the crew flying in mountain area.	2. Request in line w/ JAR-OPS 3. Refer to Appendix 1 to JAR-OPS 3.005(f) Operations for small helicopters (VFR day only) and Appendix 1 to JAR-OPS 3.005(g) Local area operations (VFR day only). However, excursions at cabin altitude exceeding 10 000 ft that were authorised as per appendix 1 to JAR-OPS 3.005(g) "Local area operations (VFR day only)" have not been included in this rule. Exemptions under Article 14 of (EC) 216/2008 can however be considered by Member States.
	3. (MS: 0; INDUS:5; INDIV: 0): Should be 12 500 ft for harmonization w/ most 3rd country rules.	3. No change - Current proposal in line with ICAO.
	4. (MS: 0; INDUS: 10; INDIV: 0): 10 000 ft rigid limit is not acceptable. Operations up to 13 000 ft for up to 30 min w/o the need of supplemental oxygen should be allowed (in line w/ ICAO). JAR-OPS 3.385 to be inserted.	4. No change - Current proposal in line with ICAO. Ref. (a)(1)(i).

A: Rule	B: Summary of comments	C: Reason for change, remarks
	5. (MS: 1; INDUS: 0; INDIV: 0): Providing oxygen for passengers should only be applicable to CAT operations, and is already covered by OPS.CAT.440 and table 2 OPS.CAT.440.	5. The requirement is maintained for CAT.IDE.
(1) in the case of non-pressurised aircraft:		
(i) all crew members and at least 10% of the passengers for any period in excess of 30 minutes when the pressure altitude in the passenger compartments will be between 10 000 ft and 13 000 ft; and		
(ii) all crew members and passengers for any period that the pressure altitude in passenger compartments will be above 13 000 ft.		
(2) in the case of pressurised aeroplanes:		
(i) all crew members and a proportion of the passengers, for any period when, in the event of loss of pressurisation and taking into account the circumstances of the flight, the pressure altitude in the passenger compartment would be above 10 000 ft; and	1. (MS: 0; INDUS: 1; INDIV: 0): Proportion of passengers to be clearly defined.	1. Text aligned with EU-OPS/JAR-OPS 3.
(ii) all the occupants of the passenger compartment for no less than 10 minutes, in the case of aeroplanes operated at pressure altitudes above 25 000 ft, or operated below that altitude, but under conditions that will not allow them to descend safely to a pressure altitude of 13 000 ft within four minutes; and		
(3) in the case of pressurised helicopters, all crew members and a proportion of the passengers, for any period when, in the event of loss of pressurisation and taking into account the circumstances of the flight, the pressure altitude in the passenger compartment would be above 10 000 ft.		
(b) When engaged in performing duties essential to the safe operation of an aircraft in flight, flight crew members shall use breathing oxygen continuously in the circumstances specified in (a).	1. (MS: 0; INDUS: 1; INDIV: 0): Should be transferred to Operational Procedures (Use of supplemental oxygen)-, in consistency w/ ICAO and EU-OPS.	1. & 2. This is moved to CAT.OP in –line with EU-OPS 1.385

A: Rule	B: Summary of comments	C: Reason for change, remarks
	2. (MS: 0; INDUS: 1; INDIV: 0): "the circumstances specified in (a)" could be interpreted as being a requirement to breath oxygen continuously above 10 000 ft because actions of the flight crew are essential to the safe operation and a cabin decompression will lead to a cabin altitude above the 10 000 ft criteria. This is not the intent of the proposed requirement. To be replaced by EU-OPS 1.385.	
(c) Aircraft operated at altitudes for which the oxygen supply is required in accordance with (a) shall be equipped with oxygen storage and dispensing apparatus.		
PRESSURISED AERPLANES		
(d) Pressurised aeroplanes operated at flight altitudes above 25 000 ft, or pressurised aeroplanes used in commercial air transport, shall, in addition, be equipped with a device to provide a warning indication to the flight crew of any loss of pressurisation.		1.Applicability of the requirement is restricted to pressurised aeroplanes operated above pressure altitude 25 000 ft, in line with ICAO Annex 6 Part I

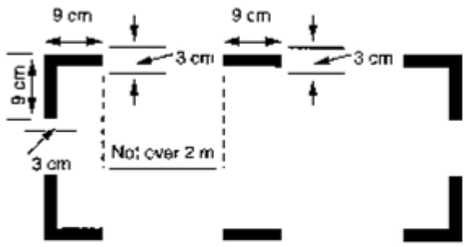
A: Rule	B: Summary of comments	C: Reason for change, remarks
OPS.GEN.445 Operations in icing conditions at night		
Aircraft flying in expected or actual icing conditions at night shall be equipped with a means to illuminate or detect the formation of ice. Such illumination shall not cause glare or reflection that would handicap flight crew members in the performance of their duties.	1. (MS: 0; INDUS:2; INDIV: 0): An objective requirement for Flight in Expected or Known Icing Conditions should be appended to this rule.[2] This goes beyond the ERs and places the responsibility with the PIC for entering icing conditions. This will also be seen by Private Pilots who will then know to avoid such conditions. There might also be a need to provide an objective requirement on which to the requirement for procedures is hung – such as:[3] This might have to be limited to complex aircraft and commercial operations 2. (MS: 0; INDUS: 1; INDIV: 0): Paragraph a) of EU-OPS 1.675 / JAR-OPS 3.675 missing. To be reintroduced.	1. & 2. Such requirement was indeed provided in paragraph a) of EU-OPS /JAR-OPS 1.675 which was transferred into Basic Regulation EC 216/2008 – Annex IV – Paragraph 2.a.5. Operational procedures are addressed in CAT.OP.

[2]"(c) The pilot-in-command shall not commence a flight in known or expected icing conditions unless the aircraft is certificated and equipped to cope with such conditions."

[3]"(d) An operator shall establish procedures for flights in expected or actual icing conditions."

A: Rule	B: Summary of comments	C: Reason for change, remarks
	3. (MS: 0; INDUS:2; INDIV:2): Requirement covered in CS – ref. CS 23.1419(d). No need to duplicate, especially when it differs from the CS. Either wording of the CS to be introduced, or CS to be modified.[4]	3. The requirement is maintained in line with EU-OPS 1.675. The requirement is consistent with CS 25.1403 and is therefore consider adequate to be maintained as proposed. However, we take note of the different wording of CS 23.1419(d) for future rulemaking tasks.
	4. (MS: 0; INDUS: 1; INDIV: 0): Requirement only applicable to CAT and COM, and complex. AMC OPS.GEN.445 should be introduced: "For non-complex A/C (excluded CAT and COM) a portable light can be used to illuminate or detect the formation of ice".	4. The requirement is maintained for CAT only. The use of a portable light for non-complex aircraft is not retained as the current airworthiness codes for this category of aircraft (CS-23/CS-27) does not currently refer to this method of compliance. However, we take note of the proposal for future rulemaking tasks.
	5. (MS: 1; INDUS: 0; INDIV: 0): Title to be amended "in-flight operations [...]". Equipment designed to only cover the in-flight part of the flight, not the ground part of it (i.e. taxiing).	5 .Not accepted. Means of illuminating surfaces subject to ice accretion, when retained, can be also used for inspection purposes on ground.
	6. (MS: 1; INDUS: 0; INDIV: 0): "AEROPLANE and HELICOPTER" sub-title to be added, as no other A/C category is certified to conduct flights in icing conditions.	6. The requirement is maintained for aeroplanes and helicopters only
OPS.GEN.450 Marking of break-in points	1. (MS:2; IND: 0; INDIV: 0) Not an OPS-requirement, keep design requirements within appropriate documents	1. This requirement is in line with ICAO and does not require any aircraft to have break-in areas
If areas of the aircraft's fuselage suitable for break-in by rescue crews in an emergency are marked, such areas shall be marked as shown in Figure 1 of OPS.GEN.450.		
Figure 1 of OPS.GEN.450		

[4] CS 23.1419(d): When monitoring of the external surfaces of the aeroplane by the flight crew is required for proper operation of the ice protection equipment, external lighting must be provided which is adequate to enable the monitoring to be done at night.

<table>
<tr><th>A: Rule</th><th>B: Summary of comments</th><th>C: Reason for change, remarks</th></tr>
<tr><td> 
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<tr><td>OPS.GEN.455 First-aid kits</td><td></td><td>ICAO Annex 6 Part I 6.2.2 Amdt 33 and ICAO Annex 6 Part III 4.2.2 a) following changes:
1. Medical supplies including:
a. First-aid kits;
b. Universal precaution kit;
c. Medical kit
2. Automated External Defibrillator recommendation on aeroplanes.
Are planned to be integrated as part of future rule-making tasks.</td></tr>
<tr><td>(a) Aeroplanes and helicopters. Aeroplanes and helicopters shall be equipped with first-aid kits in accordance with Table 1 of OPS.GEN.455:</td><td>1. (MS: 0; INDUS: 1; INDIV: 0)
Exemption shall be allowed for ferry flights where one FAK should be enough.</td><td>1.
The rules are aligned with EU-OPS/JAR-OPS 3.</td></tr>
<tr><td>Table 1 of OPS.GEN.455
<table><tr><th>Number of passenger seats installed</th><th>Number of first-aid kits required</th></tr><tr><td>0 to 99</td><td>1</td></tr><tr><td>100 to 199</td><td>2</td></tr><tr><td>200 to 299</td><td>3</td></tr><tr><td>300 and more</td><td>4</td></tr></table></td><td></td><td></td></tr>
<tr><td></td><td>1. (MS: 1; INDUS: 0; INDIV: 0)
The number of kits does not match the ICAO SARPS in Annexe 6, Chapter 6 that will be applicable from November 2009.</td><td>1. Number of kits updated according to ICAO Amdt 33</td></tr>
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A: Rule	B: Summary of comments	C: Reason for change, remarks
(b) Balloons.		
(1) Balloons shall be equipped with one first-aid kit.		
(2) In the case of balloons with a maximum passenger capacity of more than 11, a second first-aid kit shall be carried in the retrieval vehicle.		
(c) The first-aid kits shall be readily accessible for use.		
(d) First-aid kits shall be maintained.	1. (d) First-aid kits shall be maintained and replenished at regular intervals. Justification: In line with JAR-OPS.	1.Partially accepted Please see same comment on Emergency medical kits. Suggest to say: First aid kits shall be kept up to date. Scissors and safety pins could be a security hazard and therefore requirement is added: "carried under such conditions that prevents unauthorised access;"
OPS.GEN.460 Airborne Collision Avoidance System (ACAS) II		1. Rules applicable to ACAS are now also covered under published Opinion 05/2010 AUR.ACAS rules in line with ICAO DOC 702014 requirements and taking into account the conclusion of this drafting document.
ALL AIRCRAFT		
(a) Whenever Airborne Collision Avoidance System (ACAS) II is installed, it shall be used in normal conditions during flight in a mode that enables Resolution Advisories (RAs) to be produced for the pilot flying when undue proximity to another aircraft is detected.	1. (MS: 1; INDUS:2; INDIV: 0) Paragraphs (a) and (b) are operational rules and not equipment requirements and they should be transferred to Subpart A Section II under Operational Procedures.	1.Requirement on procedures are proposed to be moved to Section II operational procedures CAT.OP.AH.300 Use of Airborne Collision Avoidance System
(b) When an RA is produced by ACAS II, the pilot flying shall immediately take the corrective action indicated by the RA, even if this is in conflict with an Air Traffic Control (ATC) instruction. The aircraft shall be promptly returned to the terms of	1. (MS: 1; INDUS: 10; INDIV: 0) It is proposed to realign with EU-OPS 1.398 as the EU-OPS is not only clearer, but also contains an im-	1. The proposal to revert to EU-OPS 1 text is accepted

A: Rule	B: Summary of comments	C: Reason for change, remarks
the ATC instructions or clearance when the situation is resolved.	portant prerequisite for initiating any corrective action indicated by the RA, that is "unless doing so would jeopardise the safety of the aeroplane" 2. (MS: 0; INDUS: 1; INDIV: 0) Suggest: "When the situation is resolved the aircraft will thereafter be flown in accordance with the previously received and acknowledged ATC instructions or clearance." 3. (MS: 0; INDUS: 1; INDIV: 0) To further increase safety, a clause should be added that TAWS alerts or warnings to avoid terrain or obstacles take precedence over ACAS II RA instructions	2.& 3. Additional clarification to manage priority with TAWS alert is introduced. 4. Grammar is corrected
AEROPLANES		
(c) Turbine-powered aeroplanes shall be equipped with an ACAS with a minimum performance level of at least ACAS II, when having:		
(1) for non-commercial operations a maximum certificated take-off mass exceeding 15 000 kg (kilograms) or a maximum passenger seating configuration of more than 30; or		
(2) for commercial operations a maximum certificated take-off mass exceeding 5 700 kg or a maximum passenger seating configuration of more than 19.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
OPS.GEN.465.A Terrain Awareness Warning System (TAWS) - Aeroplanes	1. (MS: 0; INDUS:2; INDIV: 0) Small airplanes designed and certified to different regulations i.e. CAR-3 (preceding FAR/CS 23) were only limited to a MTOW of 12 500 lbs with no limitation on the number of seats. It is therefore unreasonable to mandate airplanes designed and certified to these earlier regulations which may have a seating capacity of one more than is required in the modern regulations to also comply with the latest regulatory requirements purely based on the number of seats.	1. The criteria of number of seats is in line with ICAO Annex 6.
(a) Turbine-powered aeroplanes with a maximum certificated take-off mass exceeding 5 700 kg, or maximum passenger seating configuration of more than nine, shall be equipped with a TAWS that meets the requirements for Class A equipment.	1. (MS: 0; INDUS:8; INDIV: 0) The requirement for Class A is not in-line with EU-OPS 1.665. Stick to EU-OPS 1.665 2. (MS: 0; INDUS: 1; INDIV: 0) The more than 9 criteria is challenge. Why not more than 19 3. (MS: 1; INDUS: 0; INDIV: 0) This rule requires a higher standard of TAWS equipment than is required by ICAO Annex 6 Part II The requirement in OPS.GEN should be Class B TAWS as the basic standard applicable to non-CAT operations. Class A TAWS is restricted to OPS.CAT and therefore the requirement should be moved to Subpart B.	1. The proposal is in line with NPA-OPS 39B draft conclusions. 2. The criteria of more than 9 is in line with current ICAO and EU-OPS requirements. 3. The proposal is in line with NPA-OPS 39B draft conclusions
(b) Reciprocating-engined-powered aeroplanes with a maximum certificated take-off mass exceeding 5 700 kg, or a maximum passenger seating configuration of more than nine and used in commercial air transport, shall be equipped with a TAWS that meets the requirement for Class B equipment.		
(c) A TAWS shall provide, automatically, a timely and distinctive warning to the pilot flying, of:	1. (MS: 0; INDUS: 1; INDIV: 0) The list of warnings that a TAWS shall provide cannot be fulfilled by basic TAWS Class B equipment which is limited to: excessive descent rate; excessive altitude loss after take-off or go-around; and unsafe terrain clearance. Update required.	1. The paragraph (c) is revised in line with NPA-OPS 39B to provide the definition of TAWS in line with EU-OPS 1.665 (c)

A: Rule	B: Summary of comments	C: Reason for change, remarks
(1) sink rate; (2) ground proximity; (3) altitude loss after take-off or go-around; (4) incorrect landing configuration; and (5) downward glide-slope deviation.		
OPS.GEN.470.A Means for emergency evacuation - Aeroplanes		
(a) Aeroplanes with passenger emergency exit sill heights of more than 1.83 metres (six feet) above the ground and aeroplanes with a separate emergency exit for the flight crew of more than 1.83 metres (six feet) above the ground, shall have means to enable passengers and crew at each exit to reach the ground safely in an emergency.		1. The requirement is clarified so that the means for emergency evacuation are required only at applicable exits.
(b) Notwithstanding, Such means need not be provided at over-wing exits if the designated place on the aeroplane structure at which the escape route terminates is less than 1.83 metres (six ft) from the ground, with the aeroplane on the ground, the landing gear extended and the flaps in the take-off or landing position, whichever flap position is higher from the ground.	1. (MS: 0; INDUS:2; INDIV: 0): Editorial change - Missing reference after "Notwith-standing" 2. (MS: 0; INDUS: 1; INDIV: 0): Editorial change - Inconsistency "feet" vs. "ft" 3. (MS: 1; INDUS: 0; INDIV: 0): "Notwithstanding" unnecessary. To be removed.	1. Change - Editorial change 2. Change - Editorial change 3. Change - Editorial change, based on comment #1
(c) The heights mentioned in (a) shall be measured:		1.Paragraph (c) is added to account for EU-OPS 1.805 (c) requirement on flight crew separate emergency exit
(1) after the collapse of, or failure to extend of, one or more legs of the landing gear, for aeroplanes type certificated after 31 March 2000; and	1. (MS: 0; INDUS: 1; INDIV: 0): Paragraph c) to be deleted and replaced by "[...] shall be measured when the aeroplane has its L/G extended." Distinction is a non-sense, as it is less strict for the aeroplanes certificated after that date.	1. The requirement is change in-line with EU-OPS
(2) when the aeroplane has its landing gear extended, for all other aeroplanes.	1. (MS: 0; INDUS:2; INDIV: 0): "for aeroplanes type certificated after 31 March 2000" - new requirement, or already part of today's certifi-cation? Impacting also existing A/C types? Clarifica-tion needed.	1. No change - No new requirement. Already part of the current EU-OPS.

A: Rule	B: Summary of comments	C: Reason for change, remarks
(d) Assisting means for emergency evacuation that deploy automatically shall be armed during all phases of flight, including taxiing.	1. (MS: 0; INDUS: 1; INDIV: 0): Editorial change - "Means of assistance"	1. No change - Current wording in line w/ EU-OPS.
OPS.GEN.475 Emergency lighting - Aeroplanes and Helicopters		
AEROPLANES		
(a) Aeroplanes with a maximum passenger seating configuration of more than nine shall be equipped with an emergency lighting system with an independent power supply to facilitate the evacuation of the aeroplane.		
(b) For aeroplanes with a maximum passenger seating configuration of more than 19, the emergency lighting system shall include:		
(1) sources of general cabin illumination;		
(2) internal lighting in floor level emergency exit areas;		
(3) illuminated emergency exit marking and locating signs;		1. (RG): The concern was to clarify that the above paragraph (b) directly copied from EU-OPS was clarify to apply to exit markings and not the exit area illumination. The "visible in daylight or in the dark" was taken from below rule paragraph (d) and is performance-based thus allowing new technologies without "illumination".
(4) in the case of aeroplanes for which the application for the type certificate or equivalent document was filed before 1 May 1972, when flying by night, exterior emergency lighting at all over-wing exits and at exits where descent assist means are required;		
(5) in the case of aeroplanes for which the application for the type certificate or equivalent document was filed after 30 April 1972, when flying by night, exterior emergency lighting at all passenger emergency exits; and		

A: Rule	B: Summary of comments	C: Reason for change, remarks
(6) in the case of aeroplanes for which the type certificate was first issued after 31 December 1957, floor proximity emergency escape path marking systems in the passenger compartments.		
(c) For aeroplanes with a maximum passenger seating configuration of 19 or less and issued with a type certificate in accordance with the European Aviation Safety Agency's (hereinafter referred to as the Agency) airworthiness codes, the emergency lighting system shall include (a)(2)(i), (a)(2)(ii) and (a)(2)(iii).		1. Erroneous EU-OPS references are corrected. Editorial change.
(d) For aeroplanes with a maximum passenger seating configuration of 19 or less and not issued with a type certificate in accordance with the applicable airworthiness codes, the emergency lighting system shall include (a)(2)(i).		1. Erroneous EU-OPS references are corrected. Reference to airworthiness codes is clarified.
HELICOPTERS		
(e) Helicopters with a maximum passenger seating configuration of more than 19 shall be equipped with:		1. paragraph included in line with EU-OPS 1.815 (b) "The system may use dome lights or other sources of illumination already fitted on the aeroplane and which are capable of remaining operative after the aeroplane's battery has been switched off." Is moved to GM
(1) an emergency lighting system having an independent power supply to provide a source of general cabin illumination to facilitate the evacuation of the helicopter; and		
(2) illuminated emergency exit marking and locating signs.		
(f) Helicopters operating over water in commercial air transport operations shall be equipped with emergency exit illumination.		
OPS.GEN.480 Seat belts and harnesses		
ALL AIRCRAFT EXCEPT BALLOONS		
(a) All aircraft, excluding balloons, used in commercial operations and complex motor-powered aircraft shall be equipped with.		
(1) a safety belt with shoulder harness incorporating a device which will automatically restrain the occupant's torso in the event of rapid deceleration on each flight crew seat; and	1. (MS:2; INDUS: 0; INDIV: 0) The wording "safety belt with shoulder harness", "safety harness", "safety belt with diagonal shoulder	1. The text is updated and definition of "safety harness"

A: Rule	B: Summary of comments	C: Reason for change, remarks
	strap" is very confusing. It is not clear whether "safety belt with shoulder harness" = "safety belt with diagonal shoulder strap". 2. (MS: 1; INDUS: 0; INDIV: 0) This provision is deemed applicable in France only for lightweight airplanes first issued with an individual certificate of airworthiness after April, 1st 1989 (Arrêté 24/07/91 § 2.4.3).	is clarified. 2. The requirement is in line with ICAO Annex 6.
(2) a safety harness on the seats for the minimum required cabin crew of all aircraft with a maximum passenger seating configuration of more than 19, which were first issued with an individual certificate of airworthiness after 31 December 1980.		1.The applicability criteria are removed in line with EU-OPS 1.730
(b) Safety belts with shoulder harnesses shall have a single point release.	1. (MS: 0; INDUS: 1; INDIV: 0) A performance objective is suggested like "Safety belts with shoulder harnesses shall be easy to release" with an associated AMC for the single point release feature. This will avoid unnecessary cost of replacing existing approved seat belts.	1.The proposed rule is compliant with EU-OPS. The comment may be subject to future rulemaking tasks. 2. (H) The proposed rule is compliant with JAR-OPS 3. The comment will be subject to future rulemaking tasks. The JAR-OPS 3.730 (b) second sentence is moved in the IR defining the safety harness.
HELICOPTERS		
(c) Helicopters used in commercial operations and complex motor-powered helicopters first issued with an individual certificate of airworthiness after 31 July 1999, shall be equipped with a safety belt with diagonal shoulder strap or safety harness for each passenger over the age of 24 months.		
OPS.GEN.485.A Crash axes and crowbars - Aeroplanes		
(a) Aeroplanes with a maximum certificated take-off mass exceeding 5 700 kg, or with a maximum passenger seating configuration of more than nine, shall be equipped with one crash axe or crowbar located on the flight deck.	1. (MS:2; INDUS: 0; INDIV: 0) The below requirements are design requirements that should not be included in OPS rules.	1.The requirements are in line with EU-OPS
(b) When the aeroplane has a maximum passenger seating configuration of more than 200, an additional crash axe or crowbar shall be carried and located in or near the most rearward galley area.	1. (MS:2; INDUS: 0; INDIV: 0) The below requirements are design requirements that should not be included in OPS rules.	1. & 2.& 3. The requirement OPS.GEN.485.A (b) is proposed to be moved to new rule OPS.CAT.485.A in line with EU-OPS.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	2. (MS:2; INDUS: 1; INDIV: 0) Further elaboration by EASA is required on the balance between security risks and safety benefits of a Crash axe being located with access by Passengers 3. (MS: 1; INDUS: 0; INDIV: 0) Move to CAT requirements OPS.CAT.485.A Crash axes and crowbars.	
OPS.GEN.490 Flight data recorder - Aeroplanes and Helicopters		
AEROPLANES		
(a) Aeroplanes:	1. (MS: 1; INDUS: 0; INDIV: 0) The FDR does not usually contain a method to fully retrieve data from its storage medium, some additional information is needed, in particular the parameters frame layout.	1.Editorial justification Flight data recorders do not contain themselves a method to retrieve data. EU-OPS wording was "and a method of readily retrieving that data from the storage medium is available". It is advised to revert back to this wording.
(1) with a maximum certificated take-off mass exceeding 5 700 kg and first issued with an individual certificate of airworthiness after 1 January 2005; and		
(2) with a maximum certificated take-off mass exceeding 27 000 kg and first issued with an individual certificate of airworthiness after 31 December 1988,		
shall be equipped with a Flight Data Recorder (FDR) which uses a digital method of recording and storing data and has a method of retrieving that data from the storage medium available.		
(b) The FDR for aeroplanes shall be capable of retaining data recorded during at least the last 25 hours.		
HELICOPTERS		

A: Rule	B: Summary of comments	C: Reason for change, remarks
(c) Helicopters:		
(1) with a maximum certificated take-off mass exceeding 3 175 kg and first issued with an individual certificate of airworthiness after 1 January 2005;		
(2) with a maximum certificated take-off mass exceeding 7 000 kg and first issued with an individual certificate of airworthiness after 1 August 1999 up to and including 31 December 2004; and		
(3) with a maximum certificated take-off mass exceeding 7 000 kg and first issued with an individual certificate of airworthiness after 31 December 1988 up to and including 31 July 1999,		
shall be equipped with an FDR which uses a digital method of recording and storing data and has a method of retrieving that data from the storage medium available.		
(d) The FDR for helicopters shall be capable of retaining data recorded during at least:		
(1) the last eight hours, for helicopters referred to in (c)(1) and (c)(2);		
(2) the last five hours, for helicopters referred to in (c)(3); and		
(3) the last 10 hours, for helicopters with a maximum certificated take-off mass exceeding 3 175 kg and first issued with an individual certificate of airworthiness after 31 December 2009.		
AEROPLANES AND HELICOPTERS		
(e) Data shall be obtained from aircraft sources which enable accurate correlation with information displayed to the flight crew.		
(f) The FDR shall automatically start to record the data prior to the aircraft being capable of moving under its own power and shall stop automatically after the aircraft is incapable of moving under its own power.		
(g) The FDR shall have a device to assist in locating it in water.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
OPS.GEN.495 Cockpit voice recorder - Aeroplanes and Helicopters	1. (MS: 1; INDUS: 0; INDIV: 0) This NPA addresses the possibility of using combined recorders in the AMCs, whereas it was addressed in JAR-OPS 1 section 1 and in EU-OPS.	1.Regulatory justification EU-OPS 1.727 is dedicated to the use of combination recorders. It contains hard requirements ("shall") on the number of combined recorders to have installed to be compliant. It is proposed here to add similar provisions in a new dedicated paragraph "OPS.GEN.502" in the main part, and to move all the relevant content of AMC OPS.GEN.490 and OPS.GEN.495 to this new paragraph.
AEROPLANES		
(a) Aeroplanes with a maximum certificated take-off mass exceeding 27 000 kg and first issued with an individual certificate of airworthiness after 31 December 1986, shall be equipped with a Cockpit Voice Recorder (CVR).		
(b) The CVR shall be capable of retaining data recorded during at least:		
(1) the preceding two hours, for aeroplanes when the individual certificate of airworthiness has been issued after 1 January 2003; or		
(2) the preceding 30 minutes, for all other aeroplanes.		
HELICOPTERS	1. (MS: 1; INDUS: 0; INDIV: 0) (H) This NPA addresses the possibility of using combined recorders in the AMCs, whereas it was addressed in section 1 of JAR-OPS 3.	1. (H) Regulatory justification There is no paragraph dedicated to combination recorders in JAR-OPS 3 section 1, but mention to combination recorders is spread over JAR-OPS 3.700 (e), JAR-OPS 3.705 (e), JAR-OPS 3.715 (g), JAR-OPS 3.720 (h). The combination recorder is defined in JAR-OPS 3, section 2, ACJ OPS 3.700(e), therefore it should also appear in an AMC.
(c) Helicopters with a maximum certificated take-off mass exceeding 7 000 kg and first issued with an individual certificate of airworthiness after 31 December 1986, shall be equipped with a CVR.	1. (MS: 1; INDUS: 0; INDIV: 0) (H) ICAO Annex 6 recommended 2 hours of recording duration for helicopters engaged in CAT.	1. (H) Regulatory justification The recording duration requirements given in CAT.IDE.H.185 (b) for helicopters are consistent with EU-OPS 3.700 and 3.705, but the wording need to be modified in order to cover the case of CVR installed on helicopters with an ICA delivered before 1 august

A: Rule	B: Summary of comments	C: Reason for change, remarks
		1999. The extension to two hours of recording duration is of significant importance for accident investigations; however the applicability date should take into account the need for the industry to adapt. Note: ICAO Annex 6 part III: " 4.3.2.3.2 From 1 January 2016, all helicopters required to be equipped with a CVR shall be equipped with a CVR capable of retaining the information recorded during the last two hours of its operation."
(d) The CVR shall be capable of retaining data recorded during at least:		
(1) the preceding one hour, for helicopters when first issued with an individual certificate of airworthiness after 31 July 1999; or		
(2) the preceding 30 minutes, for all other helicopters.		
AEROPLANES AND HELICOPTERS		
(c) The CVR shall start to record automatically prior to the aircraft moving under its own power and shall continue to record until the termination of the flight when the aircraft is no longer capable of moving under its own power.		
(d) The CVR shall have a device to assist in locating it in water.		
OPS.GEN.500 Data link recording - Aeroplanes and Helicopters		
(a) Aeroplanes and helicopters first issued with an individual certificate of airworthiness on or after 8 April 2012, which have the capability to operate data link communications and are required to be equipped with a cockpit voice recorder, shall be equipped with a means of recording the following, where applicable:	1. (MS:3; INDUS: 18; INDIV: 0) Time should be left for operators to comply. April 2012 is not achievable. In addition it is not consistent with Commission Regulation EC 29/2009	1. Regulatory justification NPA-OPS 48A Data link communications recording for new built aeroplanes proposed to mandate data link recording for all aeroplanes with a type certificate delivered on or after 1 January 2008 or an ICA delivered on or after 1 January 2010.
		Commission Regulation (EC) 29/2009 dated 16 January 2009 states in Article 3 that: "operators shall ensure that aircraft operating flights referred to in Article 1(3) (…) have the capability to operate the data link services". It will be applicable:

A: Rule	B: Summary of comments	C: Reason for change, remarks
		1. As from 7 February 2013 for those aircraft delivered an ICA after 01 Jan 2011, 2. As from 5 February 2015 for those aircraft delivered an ICA before 01 Jan 2011
		In order to avoid the loss of essential communications that used to be transmitted VHF, it is proposed to make mandatory data link communication recording as soon as achievable by the industry Two years of notice seems to be a reasonable for the industry. Since the OPS regulation should enter into force on 8 April 2012, it is proposed to mandate data link communication recording for aeroplanes with an ICA delivered on 8 April 2014.
		2. (b) to (e) make reference to a recorder. In addition, NPA 2009-11 contains a draft ETSO for stand-alone data link recorders. In order to make clear that the recording function should be performed by a crash-protected recorder, be it a CVR, an FDR or a standalone data link recorder, it is proposed to replace "means of recording" by "recorder"
(1) Data link communication messages related to air traffic services communications to and from the aircraft;		
(2) Information that enables correlation to any associated records related to data link communications and stored separately from the aircraft;		
(3) Information on the time and priority of data link communications messages, taking into account the system's architecture.		
(b) The recorder shall use a digital method of recording and storing data and information and a method for retrieving that data. The recording method shall be such as to allow the data to match the data recorded on the ground.		
(c) The recorder shall be capable of retaining data recorded during at least the preceding two hours of operation.		1.Regulatory justification The data link communications will replace some VHF communications; therefore the data-link recording duration should be aligned with those for CVR
(d) The recorder shall have a device to assist in locating it in water.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
(e) The recorder shall start to record automatically prior to the aeroplane or helicopter moving under its own power and shall continue to record until the termination of the flight when the aeroplane or helicopter is no longer capable of moving under its own power.		1.This provision is to be found in NPA-OPS 48A, proposed JAR-OPS 1.728. It is consistent with the requirement on audio (CVR) recording to start during the cockpit checks prior to engine start and last until the cockpit checks immediately following engine shutdown.
OPS.GEN.505 Preservation of FDR and CVR recordings - Aeroplanes and Helicopters	1. (MS: 0; INDUS: 1; INDIV: 0) A paragraph on the use and preservation of data link recordings should be added	1.Regulatory justification Considering the advent of data link recording the regulation should also regulate the use and preservation of data link recordings in the same manner as is done for CVR and FDR recordings. Note: the data-link communications may be recorded on the CVR, the FDR or a dedicated recorder, thus the expression "means installed on board for recording data" is more appropriate.
(a) The pilot-in-command shall be responsible for ensuring that during flight, Flight Data Recorders (FDRs) and Cockpit Voice Recorders (CVRs) are not:		1.To be moved to operational procedures Rules..
(1) disabled;		1.To be moved to operational procedures Rules.
(2) switched off; or		1.To be moved to operational procedures Rules.
(3) intentionally erased in the event of an accident or an incident which is subject to mandatory reporting.		1.To be moved to operational procedures Rules.
(b) In order to preserve the data recorded for investigating an accident or incident which is subject to mandatory reporting:		1.To be moved to operational procedures Rules.
(1) the CVR may be switched off during flight by the pilot-in-command, if he/she believes that the recorded data would otherwise be erased automatically;	1. (MS:2; INDUS: 0; INDIV: 0) ICAO Annex 6 prohibits the switching off of flight recorders in flight. OPS.GEN.505 (b) (1) is in conflict with ICAO requirements.	1. Safety justification The JAA FRSG proposed to remove this provision. The reason behind this was the concern that the first incident that resulted in the CVR being switched off may well lead to a second, more serious, incident or even an accident.. In this case, vital data would have been lost. The requirement is modified and moved to operational procedures Rules.
(2) recorders shall be de-activated upon completion of a flight; and		1.To be moved to operational procedures Rules.

A: Rule	B: Summary of comments	C: Reason for change, remarks
(3) the recorders shall not be re-activated without the investigating authority's agreement.		1.To be moved to operational procedures Rules.
(c) The operator shall preserve the original recorded data referred to in (b) for a period of 60 days, unless otherwise directed by the investigating authority.		1.To be moved to operational procedures Rules.
(d) Operational checks and evaluations of recordings from the FDR and CVR systems shall be conducted to ensure the continued serviceability of the recorders.	1. (MS: 0; INDUS: 1; INDIV: 0) A paragraph on the use and preservation of data link recordings should be added	1.Regulatory justification Considering the advent of data link recording as mentioned in OPS.GEN.500, the OPS.GEN should also regulate the use and preservation of data link recordings in the same manner as is done for CVR and FDR recordings. To be moved to operational procedures Rules.
(e) The operator shall make available any flight recorder recording that has been preserved, if so determined by the competent authority.	1. (MS: 1; INDUS: 0; INDIV: 0) The requirement that operators keep the documentation required to convert stored data into engineering units has been moved to the AMC	1.Safety justification Without this information a) the operator would be unable to establish the continued airworthiness of the FDR, b) the operator would (for large aircraft) be unable to carry out Flight Data Monitoring c) in the event of a serious incident or accident, accident investigation authorities would be unable to use the FDR data which would slow down the identification of any safety deficiencies.
		The importance of proper documentation maintenance has been stressed by many guidance documents. EU-OPS 1.160 (a)4 (ii) contains a similar requirement, but it is proposed to add that the operator shall also maintain up to date this documentation, and not only retain an outdated and sometimes incomplete documentation.
		(H) JAR-OPS 3.160 (a)(4) (ii) contains a similar requirement, but it is proposed to add that the operator shall also maintain up to date this documentation, and not only retain an outdated and sometimes incomplete documentation.

A: Rule	B: Summary of comments	C: Reason for change, remarks
		Note: Part M, as last amended with Regulation (EC) 127/2010, does not contain any provisions on operators for the maintenance of documentation related to decoding any data recorded. So, this new provision will not create any overlap and will not be incompatible with Part M.
		Safety justification This was a "shall" requirement in EU-OPS 1.160 and must stay as such, since it is essential for investigation authorities to be able to compare the accident flight data with flight data of the previous flights To be moved to operational procedures Rules.
OPS.GEN.510 Use of FDR and CVR recordings - Aeroplanes and Helicopters	1. (MS: 0; INDUS: 1; INDIV: 0) A paragraph on the use and preservation of data link recordings should be added	1. Regulatory justification Considering the advent of datalink recording as mentioned in OPS.GEN.500, the OPS.GEN should be extended to include to regulate use and preservation of datalink recordings in the same manner as is done for CVR and FDR recordings
		A level of protection similar to that of FDR recordings is probably sufficient since it is assumed that data link communications will not contain information that pertain to the private sphere of the flight crew or of the ATM operators.
Without prejudice to national criminal law:		
(a) Cockpit Voice Recorder (CVR) recordings shall not be used for purposes other than for the investigation of an accident or incident which is subject to mandatory reporting, except with the consent of all crew members concerned; and		
(b) Flight Data Recorder (FDR) recordings shall not be used for purposes other than for the investigation of an accident or incident which is subject to mandatory reporting, except when such records are:		
(1) used by the operator for airworthiness or maintenance purposes only;		

A: Rule	B: Summary of comments	C: Reason for change, remarks
(2) de-identified; or		
(3) disclosed under secure procedures.		
OPS.GEN.515 Microphones - Aeroplanes and Helicopters		
AEROPLANES		
(a) Flight crew members on flight deck duty of complex motor-powered aeroplanes and aeroplanes used in commercial operations shall communicate through boom or throat microphones, when flying below the transition level/altitude.		
HELICOPTERS		
(b) Flight crew members on flight deck duty of complex motor-powered helicopters and helicopters used in commercial operations shall wear a headset with boom microphone or equivalent and use it as the primary device for all communications.	1. (MS:3;IND: 1; INDIV: 0) Requirement should apply to all helicopters - if only to meet the EU noise exposure requirements. Crew member at working station should be included.	1.It is proposed to align with ICAO Annex 6 Part III Section III recommendation and extend the requirement to all helicopters. Justification: In all helicopters, regardless of complexity and type of operations, the pilot generally uses both hands for controlling the aircraft. Even considering that it is often possible to let go of the collective, safety demands a requirement for a "hands-free" system.
OPS.GEN.520 Flight crew interphone system		
(a) Aircraft 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.	1. (MS: 0; INDUS: 1; INDIV: 0) Interphone may be needed in single crew powered aircraft, regardless of use if cockpit noise requires it, Passenger(s) or student(s) use interphone systems as required to achieve the flight objectives. 2. (MS: 0; INDUS: 1; INDIV: 0) Crews of aircraft certified with overhead loudspeaker(s) shall not be forced to use headsets. However, they may use additional headsets if available.	1.The rule is modified in line with EU-OPS 2. The proposed rule is in line with EU-OPS.

A: Rule	B: Summary of comments	C: Reason for change, remarks
(b) When a radio communication system is required, and in addition to (a), the aircraft shall be equipped with a transmit button on the flight controls at each pilot's station.		1.The condition on radio navigation is added in line with EU-OPS/JAR-OPS 3
OPS.GEN.525 Communication equipment		
(a) Aircraft operated under Visual Flight Rules (VFR) as a controlled flight, under Instrument Flight Rules (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.	1. (MS: 0; IND: 1; INDIV: 0) Add content of EU-OPS 1.850 (b) 2. (MS: 0; IND: 1; INDIV: 0) Communication equipment is not required for VFR flight when not controlled: clarification required 3. (MS: 0; IND: 1; INDIV: 0) There is no justification to require two way radio communication for VFR night flights. If the VFR night flight takes place in areas where communication is not required	1. Accepted the content of EU-OPS 1.850 is incorporated 2. &3. The requirement is proposed to be alleviated for flight under VFR accomplished by visual reference to land-marks in line with EU-OPS 1.860
(b) The radio communication equipment required in (a) shall provide for communication on the aeronautical emergency frequency.		
OPS.GEN.530 Pressure-altitude-reporting transponder		
Aircraft shall be equipped with a pressure-altitude-reporting Secondary Surveillance Radar (SSR) transponder when required by the airspace requirements.	1. (MS: 0; IND: 1; INDIV: 0) A pressure-altitude SSR transponder shall be required for all aeroplanes and helicopters to enable ACAS-equipped aircraft to generate resolution advisories.[5] 2. (MS: 0; IND: 1; INDIV: 0) It should be added that the Air Traffic Provider can grant exemptions depending on the traffic situation for aircraft not fitted with such a tran-	1.&2. The requirement on SSR transponder is in line with EU-OPS and ensures ACAS capability regardless of the transponder-carriage rules applying to the airspace in which either aircraft is flying.

[5] As specified in ICAO Annex 6 Parts I, II and III, carriage of a pressure-altitude-reporting transponder in a non ACAS-equipped aircraft enables ACAS-equipped aircraft to avoid collisions regardless of the transponder-carriage rules applying to the airspace in which either aircraft is flying, and is the primary reason why this requirement was specified in JAR-OPS 1/EU-OPS without any airspace rule qualification. A functioning pressure-altitude-transponder enables ACAS (TCAS II) equipment to determine relative altitude between both aircraft and to compute whether or not a threat exists. Failure to transmit pressure-altitude information from an operating transponder will prevent ACAS from generating and displaying any Resolution Advisories, and in other circumstances it can result in the generation of multiple 'nuisance' alerts to the crews of the ACAS-equipped aircraft, which can be highly distracting. Such a failure will occur if the transponder does not have a pressure-altitude-reporting capability or if the altitude-reporting function is not enabled. It is suggested that OPS.GEN.530 should include a requirement applicable to aeroplanes and helicopters based upon the text currently published in (EU) OPS 1.866; 'An operator shall not operate an aeroplane or a helicopter unless it is equipped with 1. a pressure-altitude-reporting SSR responder; and 2. any other SSR transponder capability required for the route being flown.'

A: Rule	B: Summary of comments	C: Reason for change, remarks
	sponder.	
OPS.GEN.535 Navigation equipment		
(a) An aircraft shall be provided with navigation equipment which will enable it to proceed in accordance with:	1. (MS: 0; IND: 0; INDIV: 1) Unconditional requirement on navigation equipment is not consistent with communication equipment requirement 2. (MS: 1; IND: 0; INDIV: 0) The rule needs to be more specific in terms of required navigation equipment, either here, or in the AMC. 3. (MS: 1; IND: 0; INDIV: 0) For an IFR flight, it requires equipment as an aid to landing, but has no navigation requirements. Proposed text[6]	1. The requirement is proposed to be alleviated for flight under VFR accomplished by visual reference to landmarks. 2. Accepted. Specifications are given at AMC level. 3.Using a performance base approach it has been decided not to give a detailed specification at IR level.
(1) the flight plan; and		
(2) the applicable airspace requirements.		
(b) The number of navigation equipments shall be such that in the event of failure of one item of equipment during the flight, the remaining equipment will enable the aircraft to comply with (a).	1. (MS : 0 ; IND : 1 ; INDIV : 0) It should not be a requirement that the aircraft can always continue according to the original plan in case of equipment malfunction. It should be sufficient that the pilot has planned for an alternative course of ac-	1. & 2. The wording is modified in line with ICAO to allow the application of ICAO note ".— This requirement may be met by means other than the duplication of equipment." Transferred in GM OPS.GEN.535(b) to be appli-

[6](b) An aircraft flying under IFR, or under VFR over routes not navigated by reference to visual landmarks shall be equipped with navigational equipment that comprises not less than:

(1) Two independent navigation aids appropriate to the route/area to be flown; (2) An approach aid suitable for the destination and alternate heliports; (3) An Area Navigation System when area navigation is required for the route/area being flown; (4) Two VOR receiving systems on any route, or part thereof, where navigation is based only on VOR signals; and (5) Two ADF systems on any route, or part thereof, where navigation is based only on NDB signals,

A: Rule	B: Summary of comments	C: Reason for change, remarks
	tion since otherwise equipment duplication will often be required when this is not necessary. Example[7] 2. (MS: 0; IND: 1; INDIV: 0) OPS.GEN.535 (a) should be clarified so that having a magnetic compass as required for sailplanes and powered sailplanes according to OPS.GEN.410 (a)(1) does not require a secondary instrument for the same purpose	cable
I In Instrument Flight Rules (IFR) flights, an aircraft shall be provided with navigation equipment that provides guidance to a point from which a visual landing can be performed. This equipment shall be capable of providing guidance for each aerodrome at which it is intended to land in IFR and for any designated alternate aerodromes.		

[7]For instance the following scenario should be allowed without requiring two NDB receivers or RNAV:In case of a flightplan involving an NDB in the enroute part the pilot should have the option to proceed along an alternative route constituted of VORs if the aircraft's NDB receiver fails.With the current wording this scenario would not be allowed.

A: Rule	B: Summary of comments	C: Reason for change, remarks
OPS.GEN.540.A Electronic navigation data manageme–t - Complex motor-powered aeroplanes	1. (MS: 1; IND: 1; INDIV: 0) It is not clear why this only applies to aeroplanes. The 'A' should be removed from the title. This shall not be limited to complex motor-powered aeroplanes as well	1. Accepted, this rule shall be extended to any CMPA
	2. (MS: 0; IND: 1; INDIV: 0) Not a equipment specification => Include these requirements in Part OR, or in OPS Section II operational procedures.	2. This is proposed to be kept under Instruments, DATA and Equipment.
	3. (MS: 1; IND: 0; INDIV: 0) AIRAC Cycles for electronic navigation data and hard copy prints may be different (e.g. issue dates.) This creates in praxis SAFA findings in some occasions. Therefore it is recommended to define which of the sources are the primary ones for the intended operation.	3.Not accepted. This cannot be specified at IR level. It's up to the operator, depending on the type of data systems and providers he uses, to define in the Operations Manual which is his primary source and criteria for timely updating of navigation data.
	4. (MS: 0; IND:3;INDIV: 0) How can an individual owner of an airplane comply with this paragraph? This is not a proportional rule.	4. See comment on paragraph (c)
(a) An operator shall only use electronic navigation data products which support a navigation application that meets standards of integrity which are adequate for the intended use of the data.		
(b) When the electronic navigation data products support a navigation application needed for an operation requiring a specific approval as per OPS.SPA, the operator shall demonstrate to the competent authority that the process applied and the delivered products meet standards of integrity which are adequate for the intended use of the data.		
(c) An operator shall continuously monitor both the process and the products.	1. (MS: 0; IND: 1; INDIV: 0) Many operators outsource electronic navigation or chart database management to third party providers. Directly monitoring the process of third party providers is not efficient and should be done by established compliance monitoring procedures and practices.	1. Proposed text accepted.

A: Rule	B: Summary of comments	C: Reason for change, remarks
(d) An operator shall ensure the timely distribution and insertion of current and unaltered electronic navigation data to all aircraft that require it.		
OPS.GEN.545 Cabin Crew Seats		
Each seat for the minimum required cabin crew member shall be forward or rearward facing within 15° of the longitudinal axis of the aircraft.	1. (MS: 0; INDUS: 1; INDIV: 0) Add during take-off and landing.	1. AMC to specify that the forward/rearward facing requirement is applicable for takeoff and landing is introduced 2. the applicability to minimum cabin crew seat (may be ≠ than minimum cabin crew members) and therefore the applicability to cabin crew members is re-introduce in line with EU-OPS 3. CS 25.785 (h) provides already a set of design requirement on cabin crew seats that do not fully align with this rule (18° instead of 15° for forward/rearward facing criteria)) 4. The installation requirements including the reference to 15° are moved to AMC to avoid inconsistency with CS-25.

A: Rule	B: Summary of comments	C: Reason for change, remarks
OPS.GEN.550 Minimum equipment for flight		1.The intent of this rule is to implement the essential requirement of EC 216/2008 Annex IV 2.a.3 (iii) where it is required that: "the pilot in command must be satisfied that: (i) the aircraft is airworthy as specified in point 6;
		[…] (iii) instruments and equipment as specified in point 5 required for the execution of that flight are installed in the aircraft and are operative, unless waived by the applicable Minimum Equipment List (MEL) or equivalent document;
		[…]" The point 5 mentioned in the above essential requirement is the paragraph providing the Essential Requirements for Instruments, data and equipment.
		Therefore the purpose of this proposed rule is to clarify which are the legal means of releasing an aircraft in commercial air transport with inoperative instruments, items of equipment or functions that are required by Part CAT.IDE. The reference to permit to fly is proposed to be deleted the scope of the permit to fly as defined in Part 21A.701 does not correspond to the purpose of this rule.
		EU-OPS 1.030 (b) is introduced in the new proposed rule. (RG) The wording of EU-OPS 1.030 (b) is used but the "applicable for the aircraft type" is deleted and "applicable" is added before MMEL.
(a) A flight of a complex motor-powered aircraft or an aircraft involved in commercial operations shall not be commenced when any of the aircraft instruments, items of equipment or functions are inoperative, except if:		1. Although it is not required for non-complex aircraft to establish a MEL if not conducting operation for commercial purpose, as per EC 216/2008 Annex IV 8.a.3, there is no reason to prevent them to do so and to use the MEL as per its intended scope. Therefore the applicability of this rule is proposed to be changed accordingly. 2. The scope of this rule is clarified as it relates to instruments, items of equipment or functions required by this Part-CAT.IDE.

A: Rule	B: Summary of comments	C: Reason for change, remarks
(1) such the aircraft instrument, item of equipment or function is part of the operator minimum equipment list (MEL); or	1. (MS: 1; INDUS:2; INDIV: 0): Editorial change - "such" to be deleted.	1. Change - Editorial change
	2. (MS: 0; INDUS:2; INDIV: 0): Wording misleading - in contradiction w/ the intent of the MEL, i.e. items mentioned in the MEL may either be required for all flights, or be inoperative under certain conditions only.	2. Change - Editorial change: back to a wording similar to EU-OPS for clarity purpose.
	3. (MS: 0; INDUS: 1; INDIV: 0) The system MMEL/MEL will be eliminated if there is no possibility to allow dispatch below MEL but above MMEL w/ the permission of the authority. This means that operators are not encouraged to establish safety standards higher than MMEL. Ref. EU-OPS 1.030(b)	3. Content of EU-OPS 1.030 (b) is re-introduced in (a)(2).The operation outside of the MEL but inside of the MMEL constraint is introduced as per EU-OPS 1.030 (b) .
	4. (MS: 0; INDUS: 1; INDIV: 0) For operators only performing contracted ferry flights or test flights for MROs, maintaining individual operator MELs for each type/model/variant of A/C that could potentially be flown is not practicable. Therefore use of an Agency approved MMEL issued by the OEM should be considered an acceptable means of compliance w/ an equivalent level of safety.	4. (RG) An MMEL is not foreseen to be a document that can be directly used for operational purpose. Therefore the proposal is not acceptable.
	5. (MS: 0; INDUS: 2; INDIV: 0): For some VLJs there is no MEL issued.	5. No change - In case of VLJs involved in commercial operations, an MEL shall be issued. Ref. EC 216/2008 - Annex IV - Paragraph 8.a.3.
(2) the aircraft has been subject to a permit to fly issued by the competent authority or organisations approved in accordance with Part-21; or	1. (MS: 0; INDUS: 1; INDIV: 0): Editorial change - To be amended by "the A/C is subject to a PtF [...]" 2. (MS: 0; INDUS: 1; INDIV: 0): Deviation from MEL shall not be given by organisations approved iaw Part-21, but only by authorities. 3. (MS: 1; INDUS: 0; INDIV: 1): Requirement misleading - Commercial operations seem to be authorised w/ a PtF. To be amended by deleting paragraph (a)(2) and adding paragraph (d): "For A/C operated under a PtF issued by [...] the minimum equipment required for the flight has to be regulated under the flight conditions."	1. Change - Editorial change 2. This paragraph is deleted. Matters related to approval of flight conditions and issue of permit to fly are addressed by the Part-21. Such consideration regarding authorised MEL deviation under PtF is to be dealt w/ at the PtF level, i.e. Part-21, not in OPS.GEN.550(a)(2). 3. This paragraph is deleted. - The content of the change is already addressed in the current NPA proposal, since issuing a PtF implies that flight conditions have first been approved. Ref. Part-21.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	4. (MS: 0; INDUS:2; INDIV: 0): Reference to PtF -a specific A/W document- which is not what is sought here. To be amended: "(2) the A/C has been permitted to fly by the competent [...]"	4. This paragraph is deleted. (RG) The rule will no more address PtoF which are considered outside of the scope of this CAT Implementing Rules (ferry flight only).
(3) the aircraft instrument, item of equipment or function is not required for the safe operation of the aircraft.	1. (MS: 0; INDUS: 1; INDIV: 0) To be amended w/: "[...] or function, if not listed in the MEL, is not required [...]"	1. (RG) The rule will no more address handling of equipment not required for the safe operation of the aircraft, which is beyond the scope of these Implementing Rules (refer to Essential Requirements).
(b) The MEL shall not deviate from Airworthiness Directives or Safety Directives issued or adopted by the Agency when these Directives exclude the MEL alleviation.	1. (MS: 0; INDUS: 1; INDIV: 0): Editorial change - To be amended by "The MEL shall not conflict w/ agency adopted ADs and SDs when the directive proscribes MEL application." 2. (MS: 0; INDUS: 2; INDIV: 0): For some VLJs there is no MEL issued.	1.&2.The requirement is removed as it is judged not necessary as Airworthiness Directives or Safety Directives shall supersede the MEL by definition.
(c) Any instrument or item of equipment that has been installed in an aircraft and becomes inoperative shall not be removed thereof, unless:	1. (MS: 0; INDUS: 1; INDIV: 0): Editorial change - To be amended by "Any inoperative (unserviceable) A/C instrument or item of equipment shall not be removed from the A/C unless [...]" 2. (MS: 0; INDUS: 1; INDIV: 0): For concern related to transport of unnecessary weights, following condition to be added: "(4) the instrument or item of equipment is optional for flying according the AFM/RFM and the approved maintenance organisation." 3. (MS: 0; INDUS:7; INDIV: 0): Condition missing: "(4) The A/C instrument or item of equipment is not required for the safe operation of the aircraft"	1&2&3. (RG) The rule will no more address handling of equipment not required for the safe operation of the aircraft, which is beyond the scope of these Implementing Rules (refer to Essential Requirements).
(1) it is replaced by an operative instrument or equipment; or		
(2) it is specifically permitted by the MEL; or		
(3) the aircraft has been subject to a permit to fly issued by the competent authority or approved organisations.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
SUBPART B - SECTION IV - INSTRUMENTS, DATA AND EQUIPMENT		
OPS.CAT.405 Hand fire extinguishers – Motor powered aircraft		
(a) Hand fire extinguishers shall be evenly distributed in the passenger compartments, in accordance with Table 1 OPS.CAT.405.	1. (MS: 0; INDUS:2; INDIV: 0) The number of required hand fire extinguishers in the passengers compartment should not be in addition to the one required in OPS.GEN.405 (a)(1)(ii). Wording modification proposal: "Notwithstanding OPS.GEN.405 (a)(1)(ii), hand fire extinguishers shall be evenly distributed ..."	1. Accepted
Table 1 OPS.CAT.405		

Maximum passenger seating con-figuration	Number of extinguishers
7 to 30	1
31 to 60	2
61 to 200	3
201 to 300	4
301 to 400	5
401 to 500	6
501 to 600	7

A: Rule	B: Summary of comments	C: Reason for change, remarks
601 or more | 8 (b) One hand fire extinguisher shall be located in or near each galley not located on the main passenger deck.		
(c) At least one hand fire extinguisher shall be available for use in each cargo or baggage compartment accessible to crew members in flight.		
OPS.CAT.406.A Safety harness - Aeroplanes		
Aeroplanes with a maximum certificated take-off mass of less than 5 700 kg and with a maximum passenger seating configuration of less than 9 shall be fitted with a safety harness for each passenger seat.	1. (MS: 0; INDUS: 1; INDIV: 0) The requirement refers to aeroplanes with an MCTOM <5 700 kg. This is inconsistent with other requirements. The usual cases are MTOM =<5 700 kg, or MTOM >5 700 kg. Suggest amending to read "…. take off mass equal to or less than 5 700 kg ….."	1. Accepted, the condition on mass is updated for consistency.
	2. (MS:2;INDUS: 1; INDIV: 0) Safety harness for each passenger seat seems to be "overkill" and has a big economic impact for operators. Proposal: 1: Insert the following §: "A safety belt with a diagonal shoulder strap for aeroplanes with an MCTOM not exceeding 5 700 kg or a safety belt for aeroplanes with an MCTOM not exceeding 2730 kg may be permitted in place of a safety belt with shoulder harness if it is not reasonably practicable to fit the latter". Justification: it is simply not possible for some "small" aircraft to meet the certification requirement for harnesses that require any harness to be able to bear 9 G force. 2: The paragraph should be changed to require safety belt only.	2. & 3. The relief for smaller aeroplanes provided in EU-OPS 1.730 (c) should follow Art 14 since the rule doesn't determine appropriate criteria.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	3. (MS: 0; INDUS: 1; INDIV: 0): This point is impossible to implement. For example, on our Swearingen Merlins, there are no compatible passenger seats with such a harness. Also, it will be very difficult or impossible to have passengers understood that they take an aircraft with harness. For them, it would represent a lack of safety of that class of aircraft. I really think that this paragraph should only refer to the recommendation letter but could not be compulsory. Thanks for taking in consideration my comment.	
OPS.CAT.407.A Number of spare electrical fuses - Aeroplanes		
For those electrical fuses intended to be replaceable during flight, the number of spare fuses that are required to be carried, shall be the highest of:		
(a) 10% of the number of fuses of each rating;		
(b) three fuses for each rating; or		
(c) the percentage of fuses required by the applicable airworthiness code.		1. The requirement is removed as it was not included in EU-OPS 1.635
OPS.CAT.410 Flight instruments and equipment for VFR flights – Motor powered aircraft		
AEROPLANES AND HELICOPTERS		
(a) In addition to OPS.GEN.410(a), aeroplanes and helicopters operating under Visual Flight Rules (VFR) shall be equipped with:	1. (MS: 0; INDUS: 1; INDIV: 0) The text should be revised to:"(a) In addition to OPS.GEN.410(a) and (b), aeroplanes and helicopters	1. The requirements are now separated in different sections.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	operating under visual flight rules (VFR) shall be equipped with: (...) "Otherwise, for VFR flights under OPS.CAT, aeroplanes would not be required to be equipped with means of measuring and displaying attitude and stabilised heading (as per OPS.GEN.410(b)(3) and (4)).	
(1) a means of measuring and displaying:		1. The requirements are now separated in different sections.
(i) outside air temperature;	1. (MS: 0; INDUS: 30; INDIV: 10) (H) A second outside air temperature gauge is not required for helicopters or even aeroplanes (one has always been the requirement). It is usually located in the centre of the windscreen.	1. The requirements are now separated in different sections.
(ii) vertical speed;		1. The requirements are now separated in different sections.
(iii) turn and slip in the case of aeroplanes, and slip in the case of helicopters;	1. (MS: 0; INDUS:30; INDIV: 10) It is proposed to write: (iii) turn and slip for aeroplanes; and slip for helicopters. Reason: it has to be clear that only the display of slip is required for helicopters. 2. (MS: 0; INDUS: 1; INDIV: 0) Modern aircraft with glass cockpit does not always have turn and slip indicators. The rule should be modified in order to also allow modern glass cockpit aircraft accordingly. I.e. Garmin 1000 glass cockpit.	1. The requirements are now separated in different sections. 2. AMC allows integrated instruments to meet the intent of the rule.
(iv) when power is not being adequately supplied to the required flight instruments; and		
(v) in the case of aeroplanes with speed limitations expressed in terms of Mach number, a means of indicating Mach number.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
(2) an anti-collision light system; and		
(3) in the case of aeroplanes:		
(i) lighting supplied from the aeroplane's electrical system to provide adequate illumination for all instruments and equipment essential to the safe operation of the aeroplane;		
(ii) lighting supplied from the aeroplane's electrical system to provide illumination in all passenger compartments; and		
(iii) an electric torch for each crew member station.	1. (MS: 0; INDUS: 1; INDIV: 0) Lack of clarity of the requirement. It is proposed to align with EU-OPS wording.	1. Clarification of the requirement in line with EU-OPS.
(b) Helicopters with a maximum certificated take-off mass exceeding 3175 kg or operating over water out of sight of land, or when the visibility is less than 1500 m and aeroplanes shall, in addition to (a), be equipped with a means of measuring and displaying:		
(1) attitude; and		
(2) stabilised heading.		
(c) Whenever two pilots are required for the operation, aeroplanes and helicopters shall, in addition to OPS.GEN.410(c), be equipped with independent means of indicating (a)(1) (i) for each pilot.	1. (MS: 0; INDUS:2;INDIV: 0) Paragraph c states "in addition to OPS GEN 410(c), be equipped with independent means of indicating (a)(1)(i) for each pilot" This should be (a)(1)(ii), i.e. vertical speed.	1. Accepted.
(d) The airspeed indicating systems shall be equipped with a means of preventing malfunction due to either condensation or icing in the case of:		1. The criteria of applicability are revised in line with EU-OPS 1.652 (d).

A: Rule	B: Summary of comments	C: Reason for change, remarks
(1) aeroplanes with a maximum certificated take-off mass exceeding 5700 kg, or with a maximum passenger seating configuration of more than 9;		
(2) aeroplanes first issued with an individual certificate of airworthiness on or after 1 April 1999; and	1. (MS: 1; INDUS: 0; INDIV: 0) The date of the certificate of airworthiness date is incorrect. Delete 1999 and insert 1998. Justification: Incorrect compliance date.	1. The date is in line with EU-OPS 1.650 (l) 2.
(3) helicopters with a maximum certificated take-off mass exceeding 3175 kg, or with a maximum passenger seating configuration of more than 9.		
OPS.CAT.415 Flight instrument and equipment for VFR night flights and IFR flights – Motor powered aircraft		
AEROPLANES AND HELICOPTERS		
(a) In addition to OPS.GEN 415, aeroplanes and helicopters, when operating night flights under Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) flights, shall be equipped with:	1. (MS: 0; INDUS: 1; INDIV: 0) The text should be revised to:"(a) In addition to OPS.GEN 415 and OPS.CAT.410, aeroplanes and helicopters, when operating night flights under visual flight rules (VFR) and Instrument Flight Rules (IFR) flights, shall be equipped with: (...)"Otherwise, for VFR night and IFR flights, aeroplanes and helicopters would not be required to be equipped with means of indicating outside air temperature for each pilot (as per OPS.CAT.410(c)).	1. Accepted. Requirement is moved to dedicated paragraph applicable to each aircraft type.
(1) an additional means of indicating altitude;	1. (MS: 1; INDUS: 0; INDIV: 0) Complete (a)(1) with "with the same layout". Justification: A different altimeter layout is a potential cause of accident and has been identified as such by human factors. Two different layouts should be avoided.	1. The wording is clarified in line with EU-OPS.
(2) a means of annunciating to the flight crew the failure of the means used to prevent malfunction due to condensation or icing, in the case of:	1. (MS: 0; INDUS: 1; INDIV: 0) What does this mean? I assume it means that the aircraft must have a light or caption that illuminates (or an audio warning that sounds) when the ice/condensation detection system has failed.	For aeroplanes, the wording is clarified in line with EU-OPS. Clarification of the wording to specify a "means of indicating" is required, in line with NPA-OPS 39B text proposal. The criteria of applicability are also clarified to avoid misinterpretations.

A: Rule	B: Summary of comments	C: Reason for change, remarks
		For helicopters, the wording is clarified in line with JAR-OPS 3. The criteria of applicability are also clarified in line with ACJ OPS 3.650/652 to avoid misinterpretations.
(i) aeroplanes first issued with an individual Certificate of Airworthiness on or after 1 April 1998;		
(ii) aeroplanes with a maximum certificated take-off mass exceeding 5700 kg, or a maximum passenger seating configuration of more than 9 and issued with an individual Certificate of Airworthiness before 1 April 1998;		
(iii) helicopters first issued with an individual Certificate of Airworthiness on or after 1 August 1999; and		
(iv) helicopters with a maximum certificated take-off mass exceeding 3175 kg, or a maximum passenger seating configuration of more than 9 and issued with an individual Certificate of Airworthiness before 1 August 1999;		
(3) a second landing light;		
(4) in the cases of aeroplanes with a maximum certificated take-off mass exceeding 5700 kg or a maximum passenger seating configuration of more than 9 and helicopters:	1. (MS: 0; INDUS: 1; INDIV: 0) (H) By consistency with aeroplanes, only helicopters with an MCTOM exceeding 3 175 kg or with an MPSC of more than 9 should be under the scope of OPS.CAT.415 (a)(4). Wording modification proposal: (4) In the cases of aeroplanes and helicopters with an MCTOM exceeding respectively 5 700 kg and 3 175 kg or with an MPSC of more than 9 and helicopters: (i) ... (ii) ... (iii) ..	1. The applicability criteria are in line with EU-OPS/JAR-OPS 3.
(i) a standby attitude indicator capable of being used from either pilot's station;		
(ii) a means of indicating when the standby attitude indicator is being operated by emergency power; and		1. Redundant with general requirement GEN.410 Performance objective not to mention illuminated that will automatically mean lights are fitted for this pur-

A: Rule	B: Summary of comments	C: Reason for change, remarks
		pose.
(iii) a means of indicating when the standby attitude indicator is being supplied by its dedicated power supply, where the standby attitude indicator has its own dedicated power supply.		
(b) Aeroplanes and helicopters when conducting IFR operations with a single pilot shall be equipped with an autopilot with, at least, altitude hold and heading mode.		
AEROPLANES		
(c) In the case of aeroplanes, the two landing lights required may be replaced by a single light having two separately energised filaments.		
HELICOPTERS		
(d) In the case of helicopters the second landing light required shall be 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.	1. (MS: 0; INDUS: 1; INDIV: 0) (H) The text of OPS.CAT.415 (d) appears to be a method of compliance of OPS.CAT.415 (a)(3); modern helicopters are now beginning to introduce more imaginative landing light systems using LEDs - these use less power, reduce the amount of heat and last longer. They can also provide alternative ways of achieving lighting to "illuminate the ground in front of and below the helicopter and the ground on either side of the helicopters" - other than being "adjustable in flight". It is suggested either that paragraph (d) be removed and placed into AMC OPS.CAT.415.H(a)(3). (If there is subsequently a method of compliance which can meet the same objective it can be quickly added.) Or: Paragraph (d) is amended to provide an objective - thus allowing for alternative method of compliance: " (d) In the case of helicopters the second landing light required shall be adjustable in flight so as to capable of illuminating the ground in front of and below the helicopter and the ground on either side of the helicopter.	1. (H) The comments will be taken into account for future rulemaking tasks.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	2. (MS: 0; INDUS: 0; INDIV: 1) Night VFR landing light adjustable landing light at least adjustable on vertical axis AMC CAT.415. 3. (MS: 0; INDUS: 13; INDIV: 13) This differs from JAR-OPS 3 where two light sources where required (landing and search light, the latter adjustable). At least two landing lights; electric torch for each crew member.	2&3. (H) Proposed rule are aligned with JAR-OPS 3 requirements.
OPS.CAT.416 Airborne weather equipment		
When operated at night or in instrument meteorological conditions and in areas where thunderstorms, or other hazardous weather conditions regarded as detectable with airborne radar equipment may be expected, the following aircraft shall be equipped with airborne weather equipment:	1. (MS: 0; INDUS: 1; INDIV: 0) OPS.CAT.416 is cumbersome and not particularly descriptive. The wording of EU-OPS 1.670 is clear and unambiguous. Commentator suggests replacing the paragraph with the verbatim transcript of EU-OPS 1.670.	1. Accepted. The wording is reverted to EU-OPS/JAR-OPS.
	2. (MS: 0; INDUS: 1; INDIV: 0) The title of the regulation "Airborne weather equipment" is misleading. In particular because the text specifies the function to detect "... hazardous weather conditions regarded as detectable with airborne radar equipment". It is understood and supported that EASA has made all efforts to comply with the objective to avoid technical specifications in regulations. Consequently, as it was obviously impossible to keep the proven title "Airborne Weather Radar" from EU-OPS-1.760, and to clearly define the safety objective in OPS.CAT.416, Airbus proposes to revise the regulation title to read: "Airborne weather detecting equipment".	2. Accepted. AMC will mention weather radar as a means of compliance.
(a) pressurised aeroplanes;		

A: Rule	B: Summary of comments	C: Reason for change, remarks
(b) non-pressurised aeroplanes with a maximum certificated take-off mass of more than 5700 kg;		
(c) non-pressurised aeroplanes with a maximum passenger seating configuration of more than 9; and		
(d) helicopters with a maximum passenger seating configuration of more than 9.		
OPS.CAT.417.A Equipment to wipe windshield - Aeroplanes		
Aeroplanes with a maximum certificated take-off mass of more than 5700 kg shall be equipped at each pilot station with a means to maintain a clear portion of the windshield during precipitation.	1. (MS: 0; INDUS:2;INDIV: 0) If the performance-based–requirement approach prevents requiring explicitly a windshield wiper (instead requiring "means to maintain a clear portion of the windshield), the requirement title should be consistent, and not reading "equipment to wipe windshield" Airbus proposes to revise the requirement title to read: "Equipment to clear windshield".	1. Accepted
OPS.CAT.418.H Radio altimeters - Helicopters		
Helicopters on flights over water shall be equipped with a radio altimeter capable of emitting an audio warning below a preset height and a visual warning at a height selectable by the pilot, when operating:	1. (MS: 0; INDUS:2;INDIV: 0) (H) In order to: a) ensure a similar level of IR/AMC balance than the one applied with many other requirements as the radio altimeter requirements in OPS.SPA.010.NVIS and AMC OPS.SPA.010.NVIS (a), as well as for all flight performance requirements, where the detailed technical requirements have been transferred into AMCs. We also remind that it is written in Explanatory Note, item n° 35, page 31, that the general approach developed by the Agency was to put the safety objectives in the Implementing Rules and to include the technical specifications of the different instrument, data or equipment in AMC and GM.	1. (H) We cannot anticipate the outcome of the mentioned rulemaking task in this NPA. However the comment will be further considered in task OPS.054.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	b) take into account the fact that the rulemaking task OPS.054(b) ('Helicopter radio-altimeters. Review of the AMC/GM due to implementing/interpretation problems') is included in the EASA '4-year Rulemaking Programme 2009-2012' (document dated 10 February 2009), the proposal is to transfer into AMC OPS.CAT.418.H the detailed technical part of the radio altimeter warning function. The advantage of this proposal will be to allow in the future an easier and quicker modification of the detailed technical requirement in accordance with the outcome of the OPS.054(b) rulemaking task. In addition 'or' has been omitted in the first two conditions (a) and (b).	
	Wording modification proposal: 'OPS.CAT.418.H: Helicopters on flights over water shall be equipped with a radio altimeter capable of emitting an audio and a visual warning below a pre-set height and a visual warning at a height selectable by the pilot, when operating: - out of sight of the land; or - in a visibility of less than 1 500 m; or - ...' See also: the associated proposed modification (n° 98) of AMC OPS.CAT.418.H.	
(a) out of sight of the land;		
(b) in a visibility of less than 1500 m;		
(c) at night; or		
(d) at a distance from land corresponding to more than 3 minutes at normal cruising speed.	1. (MS: 0; INDUS: 15; INDIV: 12) (H) Point d): It is proposed: at a distance from land corresponding to 10 minutes at normal cruising speed.	1. (H) The proposed rule is in line with JAR-OPS 3. The proposal needs to be substantiated before it can be pro-

A: Rule	B: Summary of comments	C: Reason for change, remarks
		cessed as a future rulemaking task.
OPS.CAT.420 Flight over water – Motor-powered aircraft		
AEROPLANES		
(a) Notwithstanding OPS.GEN.420(d), an aeroplane operated at a distance away from land considered suitable for making an emergency landing, which is greater than that corresponding to:		
(1) 120 minutes at cruising speed or 400 nautical miles, whichever is the lesser, in the case of aeroplanes capable of continuing the flight to an aerodrome with the critical power unit(s) becoming inoperative at any point along the route or planned diversions; or		
(2) 30 minutes at cruising speed or 100 nautical miles, whichever is the lesser, for all other aeroplanes,		
shall, in addition to OPS.GEN.420(a)(3), OPS.GEN.420(f) and OPS.GEN.420(b), or OPS.GEN.420(c), be equipped with:		
(i) life-saving rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency, and being of sufficient size to accommodate all the survivors in the event of a loss of one raft of the largest rated capacity;		
(ii) a survivor locator light in each life-raft;		
(iii) life-saving equipment, to provide the means for sustaining life, as appropriate for the flight to be undertaken; and		

A: Rule	B: Summary of comments	C: Reason for change, remarks
(iv) at least two survival Emergency Locator Transmitters (ELT (S)).		
HELICOPTERS		
(b) Helicopters certificated for operating on water, when so doing, shall, in addition to complying with OPS.GEN.420(e) and OPS.GEN.420(f), be equipped with:		
(1) a sea anchor and other equipment necessary to facilitate mooring, anchoring, or manoeuvring the aircraft on water, appropriate to its size, weight and handling characteristics; and		
(2) equipment for making the sound signals prescribed in the International Regulations for the prevention of collisions at sea.		
(c) In addition to complying with OPS.GEN.420(e) and OPS.GEN.420(f), helicopters shall be equipped with emergency exit illumination when operated on a flight over water:	1. (MS=0; INDUS=1; INDIV=0) In order to ensure consistency with CS 27.807 requirements it is proposed to change: (c) In addition to complying with OPS.GEN.420(e) and OPS.GEN.420(f), helicopters with an MCTOM greater than 3.175 kilograms (kg) and up to 7.000 kilograms (kg), shall be equipped with emergency exit illumination marking. Helicopter over 7.000 kilograms (kg) shall be equipped with emergency exit illumination when operated on a flight over water.	1. & 2. & 3. Clarified following RG: The paragraph (b) directly copied from EU-OPS/JAR-OPS 3is clarified to apply to exit markings and not the exit area illumination. The "visible in daylight or in the dark" was taken from below rule paragraph (d) and is performance-based thus allowing new technologies without "illumination".
	2. (MS=0; INDUS=1; INDIV=0) OPS.CAT.420(b) duplicates one of the conditions of the of OPS.CAT.420(c). The duplication will be removed by reformatting (b) and deleting (c).	
	3. (MS=0; INDUS=1; INDIV=0) It is proposed to specify: "emergency exit illumination markings visible in daylight or in the dark when operating on a flight over water". Extract from the JAA HSST 2004-02 meeting	

A: Rule	B: Summary of comments	C: Reason for change, remarks
	minutes: ENAC requested clarification if this JAR-OPS 3 requirement refers to the illumination of the external area in front of the emergency exit (JAR 29.811 (a)). - JAR-OPS 3.830 (a) (4) refers to the internal lighting, however; - JAR 29.811 (d) gives the requirement for CAT.B certified JAR 29 helicopters - JAR 29.812 (a) gives the requirement for CAT.A certified JAR 29 helicopters - The airworthiness requirements in JAR 29 helicopters, contains sufficient rule materiel for 3.830 (a) (4) - JAR 27 does not contain airworthiness requirements for internal emergency exit lighting should there be a requirement FOR JAR 27.	
	If not, deletion of 3.830 (a) (4) is appropriate". Advantages of the wording modification proposal: - clarifies that the requirement refers to the (internal) marking and not to the external part of the emergency exit - ensure consistency with the wording ("remain visible and daylight or in the dark") used in OPS.CAT.427.H (d) - ensure consistency with CS 27.807 (b) (3) (marked so as to be operated even in darkness) - specifies the function to be achieved (visibility in darkness) instead of the means to ensure the function (illumination) Regarding to the fact that non-complex motor powered helicopters have small passenger cabins volumes, we don't think that the emergency exit illumination is necessary. We propose to request this equipment for complex motor powered helicopter only.	
(1) in Performance Class 1 or 2, at a distance corresponding to more than 10 minutes flying time at normal cruising speed; or		
(2) in Performance Class 3, at a distance corresponding to more than 3 minutes flying time at normal cruising speed.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
OPS.CAT.424.A Ditching - Aeroplanes		
Aeroplanes with a maximum passenger seating configuration of more than 30 shall be certificated for ditching when flying over water at a distance, from land suitable for making an emergency landing, which is greater than 120 minutes at cruising speed, or 400 nautical miles, whichever is the lesser.	1. (MS=0; INDUS=7;INDIV=0) There should not be specific requirements for certifying aircraft for ditching. Ditching requirements are part of the aircraft certification requirements without a need for a specific approval. The conditional statement of EU-OPS "unless the aeroplane complies with the ditching requirements prescribed in the applicable airworthiness code" is proposed to be kept 2. (MS=1; INDUS=1; INDIV=0) This certification requirement shall not be included in operational rules and is consequently proposed to be removed. 3. (MS=1; INDUS=3; INDIV=0) The different wording compared to EU-OPS can create the illusion that ditching can be safely performed. It is proposed to come back to EU-OPS.	1. & 2. & 3. This requirement is moved to CAT.GEN of the Implementing Rules in line with EU-OPS 1.060.
OPS.CAT.426.H Crew survival suits - Helicopters		
Each member of the crew of a helicopter shall wear a survival suit when operating:	1. (MS=1; INDUS=0; INDIV=0) In order to reduce the risk of cold shock, it is proposed to raise the ceiling from 10°C to 15°C. This is also supported by the IMO in MSC/Circ. 1046 which shows that the survival time by 10ºC is 0.8h and by 20 ºC is 1.7h wearing un-insulated suit. EASA ETSO 2C-502 and 2C-503 requires Class B isolated suit which by 15 ºC has a survival time of 7h (EN ISO 15027-1:2002 Table A.1).	1. The suggestion may be subject to a future rulemaking task. The commentator is requested to submit an appropriate proposal.
(a) in Performance Class 1 or 2 on a flight over water in support of offshore operations, at a distance from the land corresponding to more than 10 minutes flying time at normal cruising speed, when the weather reports or forecasts available to the pilot-in-command indicate that the sea temperature will be less than plus 10°C during the flight, or the estimated rescue time exceeds the estimated survival time; or	1. (MS=0; INDUS=1; INDIV=0) The word "offshore" needs to have a definition. 2. (MS=1; INDUS=0; INDIV=0) In order to reduce the risk of cold shock, it is proposed to raise the ceiling from 10°C to 15°C.This is	1. & 2. ”Offshore operations” is defined in Annex 1 - Definitions.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	also supported by the IMO in MSC/Circ. 1046 which shows that the survival time by 10ºC is 0.8h and by 20 ºC is 1.7h wearing un-insulated suit. EASA ETSO 2C-502 and 2C-503 requires Class B isolated suit which by 15 ºC has a survival time of 7h (EN ISO 15027-1:2002 Table A.1).	
(b) in Performance Class 3 on a flight over water beyond autorotational or safe forced landing distance from land, when the weather reports or forecasts available to the pilot-in-command indicate that the sea temperature will be less than plus 10°C during the flight.		
OPS.CAT.427.H Additional requirements for helicopters operating to or from helidecks located in a hostile sea area		
Helicopters operated on an offshore flight to or from a helideck located in a hostile sea area, at a distance from land corresponding to more than 10 minutes flying time at normal cruising speed, shall be operated in accordance with the following:		
(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 when the estimated rescue time exceeds the calculated survival time, or the flight is planned to be conducted at night, all persons on board shall wear a survival suit;		
(b) All life rafts carried in accordance with OPS.CAT.420 shall be installed so as to be usable in the sea conditions in which the helicopter's ditching, flotation and trim characteristics were evaluated in order to comply with the ditching requirements for certification;		
(c) The helicopter shall be equipped with an emergency lighting system, having an independent power supply, to provide a source of general cabin illumination to facilitate the evacuation of the helicopter;		
(d) All emergency exits, including crew emergency exits, and the means of opening them shall be conspicuously marked for the guidance of occupants using the exits in daylight or in the dark and such markings shall be designed to remain visible if the helicopter is capsized and the cabin is submerged;		
(e) All non-jettisonable doors which are designated as Ditching Emergency Exits shall have a means of securing them in the open position so that they do not interfere with occupant egress in all sea conditions up to the maximum required to be evaluated for ditching and flotation;		

A: Rule	B: Summary of comments	C: Reason for change, remarks
(f) All doors, windows or other openings in the passenger compartment assessed as suitable for the purpose of underwater escape shall be equipped so as to be operable in an emergency;		
(g) Lifejackets shall be worn at all times, unless the passenger or crew member is wearing an integrated survival suit that meets the combined requirement of the survival suit and lifejacket.		
OPS.CAT.430 Emergency Locator Transmitter (ELT) – Motor-powered aircraft		
AEROPLANES		
(a) Notwithstanding OPS.GEN.430(a) and OPS.GEN.430(b), aeroplanes with a maximum passenger seating configuration of more than 19 shall be equipped with at least:		
(1) two ELTs, one of which shall be automatic, in the case of aeroplanes first issued with an individual Certificate of Airworthiness after 1 July 2008; or		
(2) one automatic Emergency Locator Transmitter (ELT), or two ELTs of any type , in other cases.		
HELICOPTERS		
(b) Notwithstanding OPS.GEN.430(c), helicopters operated in performance Class 1 or 2 used in offshore operations on a flight over water, in a hostile environment and at a distance corresponding to more than 10 minutes flying time at normal cruising speed shall be equipped with an Automatically Deployable Emergency Locator Transmitter (ELT(AD)).	1. RG comment: Add “from land”	1. Accepted

A: Rule	B: Summary of comments	C: Reason for change, remarks
OPS.CAT.432 Megaphones – Motor-powered aircraft		
Aeroplanes with a maximum passenger seating configuration of more than 60 passengers and helicopters with a maximum passenger seating configuration of more than 19 passengers, when carrying one or more passenger, shall be equipped with a sufficient number of portable battery-powered megaphones for use by crew members during an emergency evacuation.	1. (MS: 1; INDUS: 1; INDIV: 0) We cannot agree to the move of major parts of the former megaphone requirements into the AMC – material. We request to re-establish the requirements on the required number of megaphones which are currently in place in JAR-OPS 3 and EU-OPS in order to provide legal clarity.	1. Accepted, the requirement is revised in line with EU-OPS
OPS.CAT.440 High altitude flights – Oxygen requirements for motor powered aircraft		1. Requirement added in line with EU-OPS for flight crew members oxygen masks on aeroplanes not operated above 25 000 ft.
ALL AIRCRAFT		
(a) Notwithstanding OPS.GEN.440(a), crew members and passengers in:		
(1) Pressurised aeroplanes shall be supplied with oxygen in accordance with Table 1 OPS.CAT.440.	1. (MS: 1; INDUS: 0; INDIV: 0): (1) states for aeroplanes whereas the sub-section is called "ALL AIRCRAFT". To be amended by "pressurised aircraft".	1. Accepted
(2) Non-pressurised aircraft shall be supplied with oxygen in accordance with Table 2 OPS.CAT.440.		
AEROPLANES		
(b) All pressurised aeroplanes operating at pressure altitudes above 25 000 ft shall be equipped with:		

<table>
<tr><th>A: Rule</th><th>B: Summary of comments</th><th>C: Reason for change, remarks</th></tr>
<tr><td>(1) quick donning masks for flight crew members;</td><td></td><td></td></tr>
<tr><td>(2) sufficient spare outlets and masks, or portable oxygen units with masks, for use by every required cabin crew member. The spare outlets or portable oxygen units shall be distributed evenly throughout the cabin to ensure immediate availability of oxygen to each cabin crew member; and</td><td></td><td>1. EU-OPS 1.770 (b)(2)(ii) in AMC</td></tr>
<tr><td>(3) an oxygen dispensing unit connected to oxygen supply terminals immediately available to each seated occupant.</td><td></td><td>1. Occupant is clarified in line with EU-OPS 1.770 (b) (2) title</td></tr>
<tr><td>(c) The total number of dispensing units and outlets required in (b) shall exceed the number of seats by at least 10%. The extra units shall be evenly distributed throughout the cabin.</td><td></td><td>1. The 10 % applies to units available to each cabin crew member, additional crew member and passenger seated occupant, wherever seated and not to the spare outlets and masks for cabin crew members along the cabin.
Requirement is modified in line with EU-OPS.</td></tr>
<tr><td>(d) In the case of pressurised aeroplanes first issued with an individual Certificate of Airworthiness after 8 November 1998 and operated at pressure altitudes above 25 000 ft, or operated at pressure altitudes at, or below 25 000 ft under conditions that would not allow them to descend safely to 13 000 ft within 4 minutes, the individual oxygen dispensing units required in (b)(3) above shall be automatically deployable.</td><td></td><td></td></tr>
<tr><td>(e) Notwithstanding Table 1 OPS.CAT.440., the oxygen supply requirements for aeroplanes not certificated to fly above 25 000 ft, may be reduced to the entire flight time between 10 000 ft and 13 000 ft cabin pressure altitudes for all required cabin crew members and for at least 10% of the passengers if, at all points along the route to be flown, the aeroplane is able to descend safely within 4 minutes to a cabin pressure altitude of 13 000 ft.</td><td></td><td>1. Applicability is clarified in line with EU-OPS 1.770 (b) (2) title.</td></tr>
<tr><td>Table 1 OPS.CAT.440 - Oxygen minimum requirements for pressurised aeroplanes
<table><tr><th>Supply for:</th><th>Duration and cabin pressure altitude</th></tr><tr><td>1. Occupants of cockpit seats on cockpit duty</td><td>(a) The entire flight time when the cabin pressure altitude is above 13 000 ft.
(b) The remainder of the flight time when the cabin pressure altitude is be-</td></tr></table></td><td>1. (MS: 0; INDUS: 1; INDIV: 0): “Cockpit” vs. “flight deck”. Standardisation requested: use of “flight deck”. Definition of flight deck = the part at the front of an A/C, larger than a cockpit, where the pilot and other crew sit.
2. (MS: 0; INDUS: 12; INDIV: 0): “when the cabin</td><td>1.
Change - editorial change: back to EU-OPS.
2.
Change - editorial change: back to EU-OPS.
3&4.</td></tr>
</table>

<table>
<tr><th>A: Rule</th><th>B: Summary of comments</th><th>C: Reason for change, remarks</th></tr>
<tr><td>
<table>
<tr><td></td><td>tween 10 000 ft and 13 000 ft, after the initial 30 minutes at these altitudes, but in no case less than:

(1) 30 minutes supply for aeroplanes certificated to fly at altitudes below 25 000 ft; and

(2) 2 hours supply for aeroplanes certificated to fly at altitudes of more than 25 000 ft.</td></tr>
<tr><td>2. Required cabin crew members</td><td>(a) The entire flight time when the cabin pressure altitude is above 13 000 ft, but not less than 30 minutes supply.

(b) The remainder of the flight time when the cabin pressure altitude is between 10 000 ft and 13 000 ft, after the initial 30 minutes at these altitudes.</td></tr>
<tr><td>3. 100% of passengers</td><td>The entire flight time when the cabin pressure altitude is above 15 000 ft, but in no case less than 10 minutes supply.</td></tr>
<tr><td>4. 30% of passengers</td><td>The entire flight time when the cabin pressure altitude is between 14 000 ft and 15 000 ft.</td></tr>
<tr><td>5. 10% of passengers</td><td>The remainder of the flight time when the cabin pressure altitude is between 10 000 ft and 14 000 ft, after the initial 30 minutes at these altitudes.</td></tr>
</table>
</td><td>pressure altitude is between xxx and yyy” to be clarified by “when the cabin pressure altitude exceeds xxx but does not exceed yyy”

3. (MS: 1; INDUS: 0; INDIV: 0):

Notes to Tables 1 and 2 are an integral part of methodology in calculating the oxygen requirements. Inappropriate to relegate them to the status of GM.

4. (MS: 0; INDUS: 0; INDIV: 1):

Table 1 is not compliant w/ ICAO Annex 6 Part I.</td><td>Revised table is compliant with EU-OPS</td></tr>
<tr><td>Table 2 OPS.CAT.440 - Oxygen minimum requirements for non-pressurised aircraft</td><td>1. (MS: 0; INDUS: 1; INDIV: 0): Editorial change: should be amended to read “High altitude flights - Supplemental oxygen [...]”.</td><td>1.

The title is modified in line w/ EU-OPS.</td></tr>
<tr><td>
<table>
<tr><td>Supply for:</td><td>Duration and cabin pressure altitude</td></tr>
<tr><td>1. Occupants of cockpit seats on cockpit duty and crew members assisting flight crew in their duties</td><td>The entire flight time at pressure altitudes above 10 000 ft.</td></tr>
<tr><td>2. Required cabin crew members</td><td>The entire flights time at pressure altitudes above 13 000 ft and for any period exceeding 30 minutes at</td></tr>
</table>
</td><td>1. (MS: 0; INDUS: 1; INDIV: 0):

To be able to continue HEMS operations in the mountains, duration of max. 30 min between 10 000 ft and 13 000 ft w/o supplemental oxygen shall be allowed.

2. (MS: 0; INDUS: 1; INDIV: 0):

Table 2 should also address excursions between 10 000 ft and 16 000 ft for a short duration w/o the</td><td>1&2&3.

No change - regarding non-pressurised helicopters, current NPA in line with JAR-OPS 3.775. Excursions at cabin altitude exceeding 10 000 ft that were authorised as per appendix 1 to JAR-OPS 3.005(g) “Local area operations (VFR day only)” have not been included in this rule.

Exemptions under Article 14 of (EC) 216/2008 can</td></tr>
</table>

A: Rule	B: Summary of comments	C: Reason for change, remarks
<table><tr><td></td><td>pressure altitudes between 10 000 ft and 13 000 ft.</td></tr><tr><td>3. 100% of passengers</td><td>The entire flight time at pressure altitudes above 13 000 ft.</td></tr><tr><td>4. 10% of passengers</td><td>The entire flight time after 30 minutes at pressure altitudes between 10 000 ft and 13 000 ft.</td></tr></table> **OPS.CAT.442.A Crew protective breathing equipment - Aeroplanes**	use of supplemental oxygen iaw procedures contained in the OM [...] and w/ prior approval of the authority. In line w/ existing JAR-OPS 3. 3. (MS: 0; INDUS: 2; INDIV: 0): Alleviations should be provided, in line w/ Appendix 1 of JAR-OPS 3.005(e), paragraph (f).	however be considered by Member States.
(a) Aeroplanes with a maximum certificated take-off mass exceeding 5 700 kg, or having a maximum passenger seating configuration of more than 19 shall be equipped with Protective Breathing Equipment (PBE) for:		1. The applicability criteria are changed to align with EU-OPS (RG)
(1) each required flight crew member at their assigned duty station; accessible for immediate use; to protect the eyes, nose and mouth and to provide oxygen for a period of at least 15 minutes; and	1. (MS: 0; INDUS: 1; INDIV: 0): This requirement is for PBE to be provided for all flight crew members at their assigned duty station and is an addition to the existing requirement for at least one PBE to be provided to flight crew. Flight crew are already provided with personal oxygen supplies and smoke goggles. It is suggested that provided that each flight crew member has access to a dedicated oxygen supply and smoke protection for the eyes, then the requirement for a separate PBE should be limited to at least one PBE for the flight crew. "Note to (1) Provided that each flight crew member has access to a dedicated oxygen supply and smoke protection for the eyes, either as a separate or combined mask, the number of required PBE can be changed to at least one"	1. Revised in line with EU-OPS EU-OPS 1.780 (a)(1) requires a PBE for each flight crew member on flight deck duty.
(2) each required cabin crew member, adjacent to their duty station; to protect the eyes, nose and mouth and to provide oxygen for a period of at least 15 minutes.	1. (MS: 0; INDUS: 1; INDIV: 0): Crew protective breathing equipment (a)2. States: it has sufficient portable PBE to protect the eyes, nose and mouth of all required cabin crew members and to provide breathing gas for a period of not less than 15 minutes. Proposal:OPS.CAT.442.A (a)(2) Replace "oxygen" by "breathable air".	1. Revised in line with EU-OPS
(b) In addition, the aeroplanes in (a) shall be equipped with an additional portable PBE located near the hand fire extinguishers required in OPS.CAT.405 (b) and (c).	1. (MS: 0; INDUS: 1; INDIV: 0): §(b) requires an additional portable PBE to be located near the hand fire extinguishers required in OPS.CAT.405 (b) and (c). Although the additional	1. Revised in line with EU-OPS EU-OPS 1.780 (d) is not limited to the applicability cri-

A: Rule	B: Summary of comments	C: Reason for change, remarks
	portable PBE associated to the hand fire extinguisher required by OPS.CAT.405(c) - near cargo/baggage compartment - may be useful on "large" aeroplanes, it is useless on aeroplanes with "small" cabin where the flight crew can instead use the portable PBE associated to the hand fire extinguisher required by OPS.CAT.405(b) - near each galley - to fight a fire in the cargo/baggage compartment. We propose to reword §(b) of OPS.CAT.442.A as follows: "In addition, the aeroplanes in (a) shall be equipped with an additional portable PBE located near the hand fire extinguishers required in OPS.CAT.405 (b) and (c), except that aeroplanes with an MPSC < 20 and MTOM < 45 360 kg need not to comply with the additional portable PBE located near the hand fire extinguisher required in OPS.CAT.405(c)".	teria of OPS 1.780 (a). The requirement of EU-OPS specifying the PBE location are combined in (d). 2. Requirement on PBE must not prevent means of communication required. moved from AMC to Implementing Rule in line with EU-OPS.
(c) Notwithstanding (b), when the fire extinguisher is located inside a cargo compartment, the additional portable PBE required shall be stowed outside, but adjacent to the entrance to that compartment.		1. Revised in line with EU-OPS
OPS.CAT.447.A First aid oxygen - Aeroplanes		
Pressurised aeroplanes operated at altitudes above 25 000 ft shall be equipped with a sufficient supply of undiluted oxygen and the adequate equipment to dispense it when involved in an operation for which a cabin crew member is required.	1. (MS: 1; INDUS: 0; INDIV: 0): LBA cannot agree to the move of major parts of the former requirements into the AMC material. We request to re-establish the first aid oxygen requirements currently in place in JAR-OPS 3 and EU-OPS in order to provide legal clarity.	1. Revised in line with EU-OPS. Paragraph moved from AMC to IR in line with EU-OPS.
OPS.CAT.457.A Emergency medical kit – Aeroplanes		
(a) Aeroplanes with a maximum passenger seating configuration of more than 30 shall be equipped with an emergency medical kit when any point on the planned route is more than 60 minutes flying time (at normal cruising speed) from an aerodrome at which qualified medical assistance is expected to be available.	1. (MS: 0; INDUS: 1; INDIV: 0): OPS.CAT.457.A (b) states that the PIC shall ensure that drugs are only administered by qualified personnel, but does not define 'qualified personnel.' EU-OPS 1.755 states that drugs are only to be administered by doctors, nurses or similarly qualified personnel. Notwithstanding AMC OPS.CAT.457.A(b) I suggest this paragraph is replaced with the verbatim	1., 2. & 3. Accepted. The wording is changed and an AMC is added to define qualified persons and access to the contents of the kit.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	wording of EU-OPS 1.755(b). 2. (MS: 0; INDUS: 2; INDIV: 0): "Personnel" implies an employment relationship; doctors and nurses on-board are passengers and not employed by the operator. Proposal: Change the wording to"…by qualified individuals."	
	3. (MS: 0; INDUS: 2; INDIV: 0): This states that "the Commander shall ensure that drugs are not administered except by qualified doctors, nurses or similarly qualified personnel". Justification: The text as currently written would limit the use of medication from the extended medical kit to those with some form of formal qualification. There is accumulated evidence over many years that cabin crew can safely administer medication provided they have adequate training and information and/or under the guidance of a specialist provider of ground to air medical advice. This capability offers significant safety (health) benefits in a situation where qualified personnel may not be available. Proposed text: Amend text to read "The EMK may only be opened with the permission of the commander to enable medically qualified volunteers, appropriately trained crew or personnel under instruction from a ground to air medical service provider to administer emergency treatments.	
(b) The pilot–in-command shall ensure that drugs are only administered by qualified personnel.		
(c) The emergency medical kit shall be:		
(1) dust and moisture proof;		

A: Rule	B: Summary of comments	C: Reason for change, remarks
(2) carried under security conditions; and	1. (MS: 0; INDUS: 2; INDIV: 0): In this context, the noun 'security' should be replaced by the adjective 'secure' or "such conditions that prevents unauthorised access by passengers without the crew's knowledge";	1. Partially accepted. Revised wording is proposed. Delete AMC OPS.CAT.457.(c)(2).
(3) maintained.	1. (MS: 0; INDUS: 8; INDIV: 0): Change as follows: (3) maintained and replenished at regular intervals or 'be kept up to date'. Justification: Compliance with EU-OPS 1.755	1. Accepted. The wording is changed to "be kept up to date" It is important that the "expiry date" of the medication contained in the EMK is reviewed at regular intervals and replaced if out-dated. The clarification of "maintained" is to be supported, but the validity dates of medication depend on the drug and may be very different. The proposed wording is more precise.
OPS.CAT.462.A Altitude alerting system – Aeroplanes		
(a) The following aeroplanes shall be equipped with an altitude alerting system capable of alerting the flight crew when approaching, or deviating from, a preselected altitude:	1. (MS: 0; INDUS: 1; INDIV: 0) "…an altitude alerting system capable of alerting the flight crew when approaching…" "…the warning shall be made by an aural signal". The Airbus family presently does not comply with this requirement, as there is not an aural signal alerting of the approach to the cleared altitude under normal operation with autopilot on.	1. The rule text of paragraph (b) is revised to align with EU-OPS requirement for the aural signal only when deviating from a preselected altitude.
(1) turbine-powered aeroplanes with a maximum certificated take-off mass exceeding 5 700 kg; or		
(2) aeroplanes with a maximum passenger seating configuration of more than 9; or		
(3) aeroplanes powered by turbo-jet engines.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
(b) In the case of (a)(3), the warning shall be made by an aural signal.	1. (MS: 1; INDUS: 0; INDIV: 0) The condition specified in sub-paragraph (b) applies to all of sub-paragraph (a) and not just (a)(3). Justification: Incorrect condition applied to Regulation.	1. Accepted. The requirement is aligned with EU-OPS 1.660.
(c) Notwithstanding (a), aeroplanes with a maximum certificated take-off mass of 5 700 kg or less, and with a maximum passenger seating configuration of more than 9, and first issued with an individual certificate of airworthiness before 1 April 1972 are not required to be equipped with an altitude alerting system.		
OPS.CAT.482 Seat belts and harnesses for the observer seat in the cockpit		
Any observer seat in the cockpit of aircraft, except balloons, shall be equipped with a safety belt with shoulder harness incorporating a device which will automatically restrain the occupant's upper torso in the event of rapid deceleration.		Observer's set safety harness requirement incorporated from OPS.CAT.482. Reference to safety harness introduced and clarification of the wording.
OPS.CAT.490 Flight data recorder – Motor powered aircraft		
AEROPLANES		
(a) Notwithstanding OPS.GEN.490(a):		
(1) aeroplanes with a maximum certificated take-off mass exceeding 5 700 kg; and		
(2) multi-engine turbine powered aeroplanes with a maximum certificated take-off mass of 5 700 kg or less, or with a maximum passenger seating configuration of more than 9, and first issued with an individual Certificate of Airworthiness after 31 March 1998,	1. (MS: 0; INDUS: 1; INDIV: 0) There is an editorial error in paragraph (a)(2) that where it should say "…multi-engine turbine powered aeroplanes with a maximum passenger seating configuration of 5 700 kg or less, and with a maximum passenger seating configuration of more than 9…".	1. Editorial justification. In EU-OPS 1.715, the exact wording was: "(a) An operator shall not operate any aeroplane first issued with an individual Certificate of Airworthiness on or after 1 April 1998 which: 1. is multi-engine turbine powered and has a maximum approved passenger seating configuration of more than nine;

A: Rule	B: Summary of comments	C: Reason for change, remarks
		or 2. has an MCTOM over 5 700 kg, unless it is equipped with a flight data recorder that uses a digital method of recording and storing data and a method of readily retrieving that data from the storage medium is available.”
shall be equipped with a flight data recorder (FDR) that uses a digital method of recording and storing data and a method of retrieving that data from the storage medium available.		
(b) Notwithstanding OPS.GEN.490(b), the flight data recorder of aeroplanes shall be capable of retaining the data recorded during at least:	1. (MS:2; INDUS: 0; INDIV: 0) The requirements for the specific parameters to be recorded which were in EU-OPS must not be 'downgraded' to what is effectively only a recommendation as the NPA only addresses them in the AMC section. If these are not required as part of the rule it is likely that any standardisation currently in place in Europe will be lost. The tables need moving back to the rule. For CAT: apply dates and weights from EU-OPS / JAR-OPS 3.	1. Safety justification The nature of the data to record should at least be described succinctly, since some information is essential for safety investigations However the exhaustive list of parameters and the recording quality requirements (range, accuracy, resolution, sampling rate) may stay in the AMC part. The list of parameters to be recorded is given in EU-OPS, in Appendix 1 to OPS 1.715, Appendix 1 to OPS 1.720 and Appendix 1 to OPS 1.725. The performance requirements on parameters (range, sampling interval, accuracy, resolution) are given in TGL 44, either by a reference to EUROCAE ED 55 in ACJ OPS 1.715 or by a dedicated table in ACJ OPS 1.720/1.715: table 1 of appendix 1 to ACJ OPS 1.720/1.725. ICAO Annex 6 Part I contains standards that state the general nature of the FDR recording:
		"6.3.1.1 A Type I FDR shall record the parameters required to determine accurately the aeroplane flight path, speed, attitude, engine power, configuration and operation. 6.3.1.2 Types II and IIA FDRs shall record the parameters required to determine accurately (…) 6.3.1.8 A Type IA FDR shall record the parameters required to determine accurately (…)" Note: The carriage requirements and the recording duration requirements are consistent with those of EU-OPS 1.715, 1.720 and 1.725 and take into account the new paragraph 1.712 introduced NPA-OPS 39B that introduced a new category of FDR for aeroplanes with

A: Rule	B: Summary of comments	C: Reason for change, remarks
		an ICA delivered after 2005.
(1) the preceding 25 hours, for aeroplanes referred to in (a)(1); or		
(2) the preceding 10 hours, in the case of aeroplanes referred to in (a)(2).		
HELICOPTERS		
(c) Notwithstanding OPS.GEN.490(c):		
(1) helicopters with a maximum certificated take-off mass exceeding 3 175 kg and first issued with an individual Certificate of Airworthiness after 31 July 1999; and		
(2) helicopters having a maximum certificated take-off mass exceeding 7 000 kg, or a maximum certificated seating configuration of more than 9, and first issued with an individual Certificate of Airworthiness between 1 January 1989 and 31 July 1999, inclusive,		
shall be equipped with a flight data recorder that uses a digital method of recording and storing data and a method of retrieving that data from the storage medium available.		
(d) Notwithstanding OPS.GEN.490(d), the flight data recorder shall be capable of retaining the data recorded during at least:		
(1) the last 8 hours, for helicopters referred to in (c)(1);		

A: Rule	B: Summary of comments	C: Reason for change, remarks
(2) the last 5 hours, for helicopters referred to in (c)(2); or		
(3) the last 10 hours for helicopter with a maximum certificated take-off mass exceeding 3 175 kg, and first issued with an individual certificate of airworthiness after 31 December 2009.		
OPS.CAT.495 Cockpit voice recorder – Motor-powered aircraft		1. Provisions added in line with EU-OPS 1.700 and 1.705.
AEROPLANES		
(a) Notwithstanding OPS.GEN.495(a):		
(1) aeroplanes with a maximum certificated take-off mass exceeding 5 700 kg; and		
(2) multi-engine turbine-powered aeroplanes with a maximum certificated take-off mass of 5 700 kg or less, or with a maximum certificated passenger seating configuration of more than 9 passengers and first issued with an individual Certificate of Airworthiness after 31 December 1989,		1. Editorial justification An "and" is required here instead of an "or". EU-OPS 1.700 states: "(a) An operator shall not operate an aeroplane first issued with an individual Certificate of Airworthiness, on or after 1 April 1998, which: 1. is multi-engine turbine powered and has a maximum approved passenger seating configuration of more than nine; or 2. has a maximum certificated take-off mass over 5 700 kg, unless it is equipped with a cockpit voice recorder which (…)" EU-OPS 1.705 states: "(a) An operator shall not operate any multi-engined turbine aeroplane first issued with an individual Certif-

A: Rule	B: Summary of comments	C: Reason for change, remarks
		icate of Airworthiness, on or after 1 January 1990 up to and including 31 March 1998 which has a maximum certificated take-off mass of 5 700 kg or less and a maximum approved passenger seating configuration of more than nine, unless it is equipped with a cockpit voice recorder which records".
		EU-OPS 1.710 states: "(a) An operator shall not operate any aeroplane with an MCTOM over 5 700 kg first issued with an individual certificate of airworthiness, before 1 April 1998 unless it is equipped with a cockpit voice recorder which records (…)"
shall be equipped with a cockpit voice recorder (CVR).		
(b) Notwithstanding OPS.GEN.495(b), in the case of aeroplanes, the cockpit voice recorder shall be capable of retaining the data recorded during at least:	1. (MS: 1; INDUS: 0; INDIV: 0) Do not agree with moving parts of requirements on the nature of the recording into the AMC – material.	1. Safety justification For commercial air transport the content of the CVR recording should be better standardized, all the more that it is described in EU-OPS 1.700 to 1.710 and JAR-OPS 3.700 to 3.710. The nature of the information to be recorded must be explicitly defined, so that relevant information will be available for safety investigators after an accident or an incident.
(1) the preceding 2 hours for aeroplanes referred to in (a)(1) when the individual Certificate of Airworthiness has been issued after 31 March 1998; or	1. (MS: 1; INDUS: 0; INDIV: 0) The duration of CVR is not covered in the paragraph for aeroplanes with an MCTOM exceeding 5 700 kg and issued before March 1998.	1. Regulatory justification According to EU-OPS 1.710, the recording duration for a CVR installed on an aeroplane with an ICA delivered before 1 April 1998 is 30 minutes.
(2) the preceding 30 minutes, for aeroplanes referred to in (a)(2).		
HELICOPTERS		
(c) Notwithstanding OPS.GEN.495(c):		

A: Rule	B: Summary of comments	C: Reason for change, remarks
(1) all helicopters having a maximum certificated take-off mass exceeding 7 000 kg; and		
(2) helicopters having a maximum certificated take-off mass exceeding 3175kg and first issued with an individual Certificate of Airworthiness after 31 December 1986,		
shall be equipped with a cockpit voice recorder.		
(d) Notwithstanding OPS.GEN.495(d), in the case of helicopters, the cockpit voice recorder shall be capable of retaining the data recorded during at least:		
(1) the preceding 1 hour for helicopters referred to in (c)(1), when first issued with an individual Certificate of Airworthiness after 31 July 1999; or		
(2) the preceding 30 minutes for helicopters referred to in (c)(2).		
OPS.CAT.515.A Microphones - Aeroplanes		1. Title is changed for clarity 2. Requirement for headset and boom microphone equipment introduced in line with EU-OPS 3. Requirement for transmit button on control wheel introduced in line with EU-OPS
(a) Each flight crew member required to be on duty shall wear the headset with boom or throat microphones and use it as the primary device to listen to the voice communications with Air Traffic Services:	1. (MS=0; INDUS=2;INDIV=0) Airplane certified with an overhead loudspeaker system shall not be required to use headsets. 2. This new proposed wording include the "equivalent" phrase to allow the use of other and newer technologies compared to the boom microphone. 3. (MS=0; INDUS=2;INDIV=0) "...shall wear the headset with boom....." I suggest this should read "...shall wear a headset with boom....."	1. Comment is addresses by adding "or equivalent" in line with EU-OPS 1.313. 2. The comment is addressed by referring to (a). 3. This requirement on procedure is moved to CAT.OP.

A: Rule	B: Summary of comments	C: Reason for change, remarks
(1) on the ground:		This requirement on procedure is moved to CAT.OP.
(i) when receiving the ATC departure clearance via voice communication; and		This requirement on procedure is moved to CAT.OP.
(ii) when engines are running;		This requirement on procedure is moved to CAT.OP.
(2) in flight below transition altitude or 10000ft, which ever is higher; and	1. (MS=1; INDUS=0; INDIV=0) Subparagraph (2) contains a heading plus a condition. Sub-paragraph (3) is a condition of sub-paragraph (2).	1. This requirement on procedure is moved to CAT.OP. 2. Incorrect formatting is corrected.
(3) whenever deemed necessary by the pilot-in-command.		1. This requirement on procedure is moved to CAT.OP.
OPS.CAT.516 Crew member interphone system – Motor-powered aircraft		
AEROPLANES		
(a) Aeroplanes with a maximum certificated take-off mass exceeding 15 000 kg, or with a maximum passenger seating configuration of more than 19 shall be equipped with a crew member interphone system.	1. (MS: 0; INDUS: 2; INDIV: 0): Aeroplanes with an MPSC < 20 and MTOM 45 360 kg to be excluded from this requirement. For that category of aeroplanes, the cabin is small enough to orally communicate w/o the need of an assisted service. 2. (MS: 0; INDUS: 1; INDIV: 0): This requirement should only be applicable to aeroplane types w/ MPSC of 20 or more. Text to amended w/ "and" instead of "or". 3. (MS: 1; INDUS: 0; INDIV: 0): The regulation should not require an interphone to be fitted where cabin crew members are not required. Where the MPSC is less than 19, a cabin crew mem-	1. & 2. & 3. The requirement for a crew member interphone system installation on aeroplanes with an MCTOM exceeding 15 000 kg also ensures a ground personnel means of two-way communication is provided. Consequently, the requirement is maintained to ensure communication with ground personnel. The requirements on the cabin are applicable only if cabin crew are required to be carried.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	ber is not required.	
	4. A further paragraph is required to exempt aeroplanes over 15 000 kg with a maximum seating configuration of less than 19 and consequently not required to carry cabin crew. Communication with ground crew can be achieved without this requirement. Suggest the following: "(b) Notwithstanding (a), the following aeroplanes are not required to be equipped with a crew member interphone system: (1) those first issued with an individual Certificate of Airworthiness before 1 April 1965 and already registered in a Member State on 1 April 1995; or (2) with an MCTOM exceeding 15 000 kg and with a maximum passenger seating configuration of less that 19 and not required to carry a cabin crew."	4. This exemption was already discussed in the Air Safety Committee responsible for the maintenance of EU-OPS. Most Member States rejected this exemption.
(b) Notwithstanding (a), those aeroplanes first issued with an individual Certificate of Airworthiness before 1 April 1965 and registered in a Member State on 1 April 1995 are not required to be equipped with a crew member interphone system.	1. (MS: 0; INDUS: 1; INDIV: 0): Term "already" is missing.	1. Change - editorial change, in line w/ EU-OPS.
HELICOPTERS		
(c) Helicopters shall be equipped with a crew member interphone system when carrying a crew member other than flight crew.		
OPS.CAT.517 Public address system – Motor-powered aircraft		
AEROPLANES AND HELICOPTERS	1. (MS: 2; INDUS: 0; INDIV: 0) (H): The paragraph is confusing by having 2 separate conditions for helicopters. The 2 A/C types to be separated for clarity.	1. Change - editorial change for clarity purpose.
(a) The following aircraft shall be equipped with a public address system:	1. (MS: 0; INDUS: 1; INDIV: 0): To distinguish between a construct that overrules a rule in GEN (using "notwithstanding") and a local variation (using "except as"), the following amendment:	1. No change - the construct using "notwithstanding" is not limited to exemptions / deviations from GEN rules in the current NPA.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	"(a) Except as provided in (b) below, the following A/C [...]"	2. Specifications in paragraph (b) moved to AMC
(1) aeroplanes with a maximum passenger seating configuration of more than 19; and		
(2) helicopters with a maximum passenger seating configuration of more than 9.		
HELICOPTERS		
(b) Notwithstanding (a), the public address system may not be required for helicopters with a maximum passenger seating configuration of less than 19 if:	1. (MS: 2; INDUS: 0; INDIV: 0) (H): The requirement is confusing by stating an upper limit w/o including an upper limit.	1. (H) Change – in accordance with JAR-OPS 3.
(1) the helicopter is designed without a bulkhead between the cockpit and passenger compartment; and		
(2) the operator can demonstrate to the competent authority that, in flight the pilot's voice is audible at all passengers seats.		
OPS.CAT.518 Fasten seat belts and no-smoking signs		
Aircraft in which all passenger seats are not visible from the flight crew seat shall be equipped with a means of indicating to all passengers and cabin crew when seat belts shall be fastened and when smoking is not allowed.	1. (MS: 0; INDUS: 1; INDIV: 0): Change "all" by "any"	1. The wording is kept in line with EU-OPS/JAR-OPS 3.
OPS.CAT.519.A Internal doors and curtains - Aeroplanes		
(a) Aeroplanes with a maximum passenger seating configuration of more than 19 shall be equipped with a door between the passenger and the cockpit with a placard saying "crew only" and a locking mechanism preventing passengers from	1. (MS: 0; INDUS: 1; INDIV: 0): missing word. "...between the passenger and the cockpit..." Amend to read " ..... between the passen-	1. The wording is corrected

A: Rule	B: Summary of comments	C: Reason for change, remarks
opening it.	ger compartment and the flight deck ...."	
(b) Doors and curtains between passenger compartments shall be opened and secured in the open position during take off and landing.		1. Rules are modified in line with EU-OPS/JAR-OPS 3
(c) Doors that can be locked by passengers shall have an unlock mechanism for crew members.		1. Rules are modified in line with EU-OPS/JAR-OPS 3
OPS.CAT.525 Communication and navigation equipment for VFR as controlled flights, night flights and IFR flights – Motor-powered aircraft	1. (MS=0; INDUS=1; INDIV=0) Rules on communication and navigation equipment should be split as in OPS.GEN. 2. (MS=2;INDUS=1; INDIV=0) An additional rule to provide a requirement for radios for VFR is required: "OPS.CAT.524 Radio equipment for operations under VFR over routes navigated by reference to visual landmarks (a) motor powered aircraft shall be provided with radio equipment that permits: (1) communication with appropriate ground stations; (2) communication with appropriate air traffic control facilities; and (3) reception of meteorological information." Proposed OPS.CAT.525 is not compliant with: - ICAO Annex 6 Part III Section II Chapter 5.1 - ICAO Annex 6 Part I Chapter 7.1 for which the Standard is unconditional.	1. Accepted. The rules an communication and navigation systems will be spilt into two separate paragraphs in line with EU-OPS/JAR-OPS 3 2. Accepted. The new proposal includes dedicated requirements for operations under VFR over routes navigated by reference to visual landmarks
(a) Motor powered aircraft shall be equipped with:		
(1) two independent radio communication means;	1. (MS=0; INDUS=1; INDIV=0) This would imply also two independent area navigation equipment. Smaller business jets do not always have two completely independent area navigation equipment. Often it is just one FMS with one CDU	1. EU-OPS 1.865 (g) requirements specific to ETOPS on communication equipment are in AMC 2.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	and two GPS receivers. Technically this could not be considered fully independent. There should be an exclusion clause already in the IR to allow for single area navigation equipment to be used. Secondly, the terminology of "independent" might raise question with modern systems that use parts of equipment simultaneously or in back-up mode (like display units, avionics busses, graphics modules etc.). These systems have complete redundancy but cannot be considered fully independent. Proposal: Add "or redundant" after independent. Add "Aeroplanes with an MPSC of less than 10 may have only one area navigation equipment if this equipment is capable of incorporating current positions from more than one navigation source and has sufficient warning capabilities to advise the flight crew of loss of either navigation source, unless required differently by airspace requirements for the route to be flown."	Rule included in line with EU-OPS 1.865 (c)
(2) two independent navigation equipment appropriate for each phase of flight and appropriate to the route/area.		1. Rule included in line with ICAO Annex 6 Part I Chapter 7.2.8 and consistent with the objective of EU-OPS 1.865 (d). Specific requirements of EU-OPS 1.865 (d) (1) and EU-OPS 1.865 (e) & (f) are in AMC. Except "For the intended route" that is removed as this may be confusing when alternate aerodromes are considered in the flight plan.
OPS.CAT.526 Audio selector panel		
Aircraft operated under Instrument Flight Rules (IFR) shall be equipped with an audio selector panel operable from each flight crew member station.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
SUBPART A - SECTION IV - INSTRUMENTS, DATA AND EQUIPMENT		
GM OPS.GEN.400(b) Instruments and equipments - General		
APPROVED EQUIPMENT The equipment approval in OPS.GEN.400(b) means that the equipment should have an authorisation or an approval in accordance with Part-21 (e.g. European Technical Standards Order (ETSO) authorisation).		
GM1 OPS.GEN.400(c) Instruments and equipments - General		
NON-APPROVED EQUIPMENT		
1. The provision of this paragraph does not exempt the item of equipment from complying with Part-21 if the instrument or equipment is installed in the aircraft. In this case, the installation should be approved as required in Part-21 and should comply with the applicable airworthiness codes.		
2. The functionality of non-installed instruments and equipment required by Part-OPS which 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.		
3. The failure of additional non-installed instruments or equipment not required by Part-OPS or the airworthiness codes or any applicable airspace requirements should not adversely affect the airworthiness and/or the safe operation of the aircraft. Examples are the following: a. Instruments supplying additional flight information (e.g. stand-alone Global Positioning System (GPS)); b. Some aerial work equipment (e.g. some mission dedicated radios, wire cutters); c. Non-installed passenger entertainment equipment.		
GM2 OPS.GEN.400(c) Instruments and equipments - General		
LIST OF NON-APPROVED EQUIPMENT		
The following items are typical examples of equipment which do not need an equipment approval: 1. Electric torch; 2. Accurate time piece;		

A: Rule	B: Summary of comments	C: Reason for change, remarks
3. Child restraint devices 4. Chart holder; 5. First aid kits; 6. Megaphones; 7. Survival and signalling equipment; 8. Sea anchors and equipment for mooring.GM OPS.GEN.400(e) Instruments and equipments - General		
ACCESSIBILITY AND POSITIONING OF INSTRUMENTS AND EQUIPMENT		1. Omitted title is introduced
This requirement implies that whenever an instrument is required in an aircraft operated in a multi-crew environment, the instrument needs to be visible from each flight crew station.	1. This is not sensible guidance in all aircraft – in particular training aircraft with tandem seating. Replication should be an acceptable alternative.	1. The text is aligned with existing source for clarification.
GM OPS.GEN.405(a)(1) Equipment for all aircraft		
HAND FIRE EXTINGUISHERS		
1. In the case of other than complex motor-powered aircraft, a hand fire extinguisher is considered to be necessary due to the development of toxic fumes when light composite materials catch fire.	1. (MS: 1; IND: 0; INDIV: 0) The GM is not the proper place to give the rational for the provision requiring hand fire extinguisher. Furthermore composite materials can be found in any part of any aircraft. Proposal: delete paragraph 1.	1. Deleted - - not applicable to CAT.IDE
2. For aerobatic flights, the hand fire extinguishers may become a hazard due to high G-loads.	1. (MS: 1; IND: 0; INDIV: 0) The GM is not the proper place to give the rational for the provision exempting hand fire extinguisher for aerobatic flights. Proposal: Delete paragraph 2 and put a definition of aerobatic flights in OPS.GEN.010 Definitions "Any flights including manoeuvres other than…"	1. Deleted - not applicable to CAT.IDE
AMC OPS.GEN.405(a)(2) Equipment for all aircraft		
SEATS FOR MINIMUM REQUIRED CABIN CREW		
Seats for the minimum required cabin crew members should be located close to the emergency exits and where cabin crew members can best assist passengers in the event of an emergency evacuation.	1. (MS: 0; IND:9; INDIV: 0) This new requirement is different from EU-OPS 1.730 a 6. It would have a huge impact in relation to Type III exits which cannot be justified. This trade union (ETF) proposal was discussed in-depth within the JAA	1. Cabin crew seat location requirement aligned with EU-OPS 1.730 (a) (6) and (H) JAR-OPS 3.730 (a) (6).

A: Rule	B: Summary of comments	C: Reason for change, remarks
	which concluded that such a proposal cannot be justified on safety grounds. We urge EASA to stick to EU-OPS Proposal: Stick to EU-OPS and realign with EU-OPS 1.730 a 6 2. (MS: 1; IND: 0; INDIV: 0) This AMC should be rule material and incorporated into OPS.GEN.545 relating to cabin crew seats. Delete AMC.OPS.GEN(a)(2).	2. AMC content is proposed to be moved to the IR.
AMC OPS.GEN.405(a)(4) Equipment for all aircraft		
RESTRAIN DEVICES FOR PERSON YOUNGER THAN 24 MONTHS - CHILD RESTRAIN DEVICES (CRD)		
1. A child restraint device (CRD) is considered to be acceptable if: a. It is a 'supplementary loop belt' manufactured with the same techniques and the same materials of the approved safety belts; or b. It complies with paragraph (b) below.	1. It is a 'supplementary loop belt' manufactured with the same techniques and the same materials of the approved safety belts; or …. [There is a potential problem with wet-leased operations from third country carriers, particularly US carriers, if the IRs apply. The FAA does not permit the use of supplementary loop belts for infants.]"	1. Wet-lease does not have to comply with our IR. Compliance with the ER or an 'equivalent standard' is considered sufficient.
2. Provided the CRD can be installed properly on the respective aircraft seat, the following CRDs are considered "acceptable": a. CRDs approved for use in aircraft by a competent authority on the basis of a technical standard and marked accordingly. b. CRDs approved for use in motor vehicles according to the UN standard ECE R 44, -03 or later series of amendments; or c. CRDs approved for use in motor vehicles and aircraft according to Canadian CMVSS 213/213.1; or d. 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". e. 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). f. Devices approved for use in cars, manufactured and tested to standards equivalent to those listed above. The device must be marked with an associ-		

A: Rule	B: Summary of comments	C: Reason for change, remarks
ated 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.		
3. Location		
a. 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 it is positioned. Rearward facing CRDs can only be installed on forward facing passenger seats. A CRD may 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.		
b. A child in a restraint device should be located as near to a floor level exit as feasible.		
c. A child in a restraint device should not hinder evacuation for any passenger.		
d. For complex motor-powered aircraft involved in commercial air transport, a child in a restraint device 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 is not recommended. Other locations may be acceptable provided the access of neighbour passengers to the nearest aisle is not obstructed by the CRD.	1. (MS: 0; IND: 1; INDIV: 0) Cross-aisle seats with a bulkhead immediately in front are the normal locations for baby bassinette positions and so often requested by passengers with CRDs. I can see a case for CRDs not being in cross-aisles that are directly between exits i.e. without a bulkhead, as these form part of the evacuation route.	1. Clarification of the location requirement.
e. For complex motor-powered aircraft involved in commercial air transport, in general, only one CRD per row segment is recommended. More than one CRD per row segment is allowed if the children are from the same family or travelling group provided the children are accompanied by a responsible person sitting next to them. A row segment is the fraction of a row separated by two aisles or by one aisle and the aircraft fuselage.		
4. Installation		
a. CRDs should only be installed on a suitable aircraft 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 an aircraft 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 aircraft seats that are equipped with such connecting devices and should not be attached by the aircraft seat lap belt. The method of connecting should be the one shown in the manufacturer's instructions provided with each CRD.		
b. All safety and installation instructions must be followed carefully by the responsible person accompanying the infant. For aircraft involved in commer-		

A: Rule	B: Summary of comments	C: Reason for change, remarks
cial air transport, cabin crew should prohibit the use of any inadequately installed CRD or not qualified seat.		
c. 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.		
d. 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.		
e. Forward facing restraint devices with an integral harness must not be installed such that the adult safety belt is secured over the child.		
5. Operation		
a. Each CRD should remain secured to a passenger seat during all phases of flight, unless it is properly stowed when not in use.		
b. Where a CRD is adjustable in recline it must be in an upright position for all occasions when passenger restraint devices are required.		
AMC OPS.GEN.410(a)(2) Flight instruments and equipment - VFR flights		
MEANS FOR MEASURING AND DISPLAYING THE TIME		
1. For other than complex motor-powered aircraft not involved in commercial operations, a means of measuring and displaying the time in hours, minutes and seconds may be a wrist watch capable of the same functions.		
2. For complex motor-powered aircraft, an acceptable means of compliance with OPS.GEN.410(a)(2) should be considered to be a clock displaying hours, minutes and seconds, with a sweep-second pointer or digital presentation.		
AMC OPS.GEN.410(a)(3) Flight instruments and equipment - VFR flights		
CALIBRATION OF THE MEANS FOR MEASURING AND DISPLAYING PRESSURE ALTITUDE		
1. The instrument measuring and displaying pressure altitude should be calibrated in feet (ft), with a sub-scale setting, calibrated in hectopascals/millibars, adjustable for any barometric pressure likely to be set during flight.		
2. In the case of sailplanes and balloons, calibration in metres (m) is acceptable.		
AMC OPS.GEN.410(a)(4) Flight instruments and equipment - VFR flights		
CALIBRATION OF THE INSTRUMENT INDICATING AIR SPEED - SAILPLANES,		

A: Rule	B: Summary of comments	C: Reason for change, remarks
AEROPLANES AND HELICOPTERS		
The instrument indicating air speed should be calibrated in knots (kt). In the case of sailplanes with a maximum certificated take-off mass below 2 000 kg and aeroplanes other than complex motor-powered aeroplanes with a maximum certificated take-off mass below 2 000 kg, calibration in kilometres (km) per hour is acceptable.		1. "sensitive type" added in line with EU-OPS/JAR-OPS 3
AMC OPS.GEN.410(d)(1)(i) Flight instruments and equipment - VFR flights		
MEANS OF INDICATING DRIFT DIRECTION - BALLOONS		
The drift direction may be determined by using a map and reference to visual landmarks.		
AMC OPS.GEN.410(b)(3) and OPS.GEN.415(a) Flight instruments and equipment - VFR flights and flight instruments and equipment - VFR night flights and IFR flights		1. Incorrect reference changed
ALTIMETERS - AEROPLANES		
The altimeters of aeroplanes operating VFR flights when the aircraft cannot be maintained in a desired attitude without reference to one or more flight instruments, and of IFR flights, should have counter drum-pointer or equivalent presentation.	1. (MS: 1; IND: 1; INDIV: 0) Exemptions granted by NAA to operate aircraft equipped with counter drum pointer presentation (e.g. MEP PA23 Aztec, PA34 Seneca, PN68 Partenavia) with operational restrictions to 10 000 ft operating altitude. Aircraft operate both public transport (PT) /commercial air transport (CAT), aerial work (AW) (flight training) and privately. The above cases shall remain acceptable, based on 10 000 ft altitude limitation (similar to RVSM, B-RNAV, etc…). Only when an aeroplane with a three pointer type altimeter flies above 10 000 feet is there any possibility of confusion being caused by the third pointer (which displays units of tens of thousands of feet). Therefore, the undoubted safety benefit of a counter drum-pointer altimeter only comes into effect when an aircraft flies above 10 000 feet. If an aeroplane is subject to an operational limit whereby it does not fly above 10 000 feet, altimeters other than those with a counter drum-pointer indicator would provide the pilot with an equivalent presentation to that achieved with a counter drum-pointer altimeter. A safety level equivalent to that attained by OPS 1.652(c) would be achieved.	1. It is proposed to include an exception for unpressurised aeroplanes operating below 10 000 ft.

A: Rule	B: Summary of comments	C: Reason for change, remarks
AMC OPS.GEN.410(b)(4) and OPS.GEN.415(a) Flight instruments and equipment - VFR flights and flight instruments and equipment - VFR night flights and IFR flights		
HEADING INDICATOR - HELICOPTERS		
Stabilised heading should be achieved for VFR flights by a gyroscopic direction indicator, whereas for IFR flights, this should be achieved through a magnetic gyroscopic direction indicator.		
AMC OPS.GEN.410 and OPS.GEN.415 Flight instruments and equipment - VFR flights and flight instruments and equipment - VFR night flights and IFR flights		
INTEGRATED INSTRUMENTS		
1. 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 aircraft for the intended type of operation.		
2. The means of measuring and indicating turn and slip, aircraft attitude and stabilised aircraft 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.		
AMC OPS.GEN.410(c) and OPS.GEN.415(a) Flight instruments and equipment - VFR flights and flight instruments and equipment - VFR night flights and IFR flights		
MULTI-PILOT OPERATIONS - DUPLICATE INSTRUMENTS - AEROPLANES AND HELICOPTERS		
Duplicate instruments include separate displays for each pilot and separate selectors or other associated equipment where appropriate.		
AMC OPS.GEN.415(a)(1) Flight instruments and equipment - VFR night flights and IFR flights		
OUTSIDE AIR TEMPERATURE		
1. The instrument should be calibrated in degrees Celsius.	1. (MS: 0; IND: 1; INDIV: 0) This part cannot be applicable on third country aircraft, because if you change the OAT-meter from	1. The EU-OPS/JAR-OPS 3 1.650 (j) and 1.652 (i) requires calibration in degrees Celsius.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	Fahrenheit to Celsius, the aircraft is not airworthy anymore by the originator. "Should" shall be interpreted as "should".	
2. A means of indicating outside air temperature may be an air temperature indicator which provides indications that are convertible to outside air temperature.		
AMC OPS.GEN.415.A(a)(3) Flight instruments and equipment - VFR night flights and IFR flights		1. This AMC is moved to IR level. 2. MC introduced in line with EU-OPS/JAR-OPS 3 1.650 (l) and 1.652 (k)(2).
ALTERNATIVE SOURCE OF STATIC PRESSURE - AEROPLANES		
1. Aeroplanes should have two independent static pressure systems.		
2. However, in the case of propeller driven aeroplanes with a maximum certificated take-off mass of 5 700 kilograms (kg) or less, one static pressure and one alternative source of static pressure may be allowed.		
GM OPS.GEN.415(a)(5) Flight instruments and equipment - VFR night flights and IFR flights		1. This paragraph is removed in CAT.IDE as the ICAO reference is not applicable.
NAVIGATION LIGHTS		
Specifications for navigation lights are contained in Appendix 1 to International Civil Aviation Organization (ICAO) Annex 6, Part II.		
AMC OPS.GEN.415.H(a)(6) Flight instruments and equipment - VFR night flights and IFR flights		
LANDING LIGHT - HELICOPTERS		
The landing light should be trainable, at least in the vertical plane.		
AMC OPS.GEN.415(b) Flight instruments and equipment - VFR night flights and IFR flights		
CHART HOLDER		
An acceptable means of compliance with the chart holder requirement would be to display a pre-composed chart on an Electronic Flight Bag (EFB).		

A: Rule	B: Summary of comments	C: Reason for change, remarks
AMC OPS.GEN.415(d) Flight instruments and equipment - VFR night flights and IFR flights		
BALLOON LIGHTS		
1. The position lights should be one steady aviation white position light, and one flashing aviation red position light (or flashing aviation white) with an effective flash frequency of at least 40, but not more than 100, cycles per minute.		
2. Both lights should have 360 degrees horizontal coverage and should be visible for at least 2 miles (approximately 3.22 km) under clear atmospheric conditions.		
3. The white light should be located not more than 20 ft below the basket, trapeze, or other means for carrying occupants. The flashing red or white light should be located not less than seven ft or more than 10 ft below the steady white light.		
4. There should be a means to retract and store the lights.		
AMC OPS.GEN.420(e) Flights over water		
LIFE JACKETS - HELICOPTERS		
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.		
GM OPS.GEN.420(a)-(e) Flights over water		
LIFE JACKETS - ALL AIRCRAFT		
Seat cushions are not considered to be flotation devices.		
GM OPS.GEN.420(a), (d) and (f) Flights over water		
EQUIPMENT FOR MAKING DISTRESS SIGNALS - SAILPLANES, BALLOONS, AEROPLANES AND HELICOPTERS		
The equipment for making distress signals is described in ICAO Annex 2.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
AMC OPS.GEN.420(a), (d) and (g) Flights over water	1. (MS: 1; IND: 2; INDIV: 0) Not practical requirement 2. CAT operations shall be excluded 3. The header of this AMC tailored to helicopters and seaplanes/sailplanes and there is therefore probably an editorial error. This should read AMC OPS GEN 420 (c) (instead of (d)) as paragraph 2 cannot be complied with for aeroplanes other than sailplanes and seaplanes.	1. & 2. & 3. Accepted. This AMC is deleted for CAT.IDE.
RISK ASSESSMENT		
1. When conducting the risk assessment, the pilot-in-command should base his/her decision, as far as is practicable, on the implementing rules and AMCs applicable to the operation of aircraft.		
2. The pilot-in-command should, for the 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; d. The availability of search and rescue facilities.		
AMC OPS.GEN.420(f) Flights over water		
LIFE-SAVING RAFTS - HELICOPTERS		
1. At least 50% of the life rafts carried should be deployable by remote control.		
2. Rafts which are not deployable by remote control and which have a mass of more than 40 kg should be equipped with some means of mechanically assisted deployment.		
AMC OPS.GEN.420(h) Flights over water		1. Not applicable to CAT.IDE
LIFE JACKETS		
The means of electric illumination should be a survivor locator light.		
GM OPS.GEN.425.H Ditching - Helicopters		
PERFORMANCE CLASS 2 TAKE-OFF AND LANDING		

A: Rule	B: Summary of comments	C: Reason for change, remarks
Helicopters operated in Performance Class 2 and taking off or landing over water are exposed to a critical power unit failure.		
GM OPS.GEN.430 Emergency Locator Transmitter (ELT)		
DEFINITION		
An Emergency Locator Transmitter (ELT) is a generic term describing equipment which broadcasts distinctive signals on designated frequencies and, depending on application, may be activated by impact or may be manually activated.		
AMC1 OPS.GEN.430 Emergency Locator Transmitter (ELT)		
ELT BATTERIES – MOTOR-POWERED AIRCRAFT		
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 OPS.GEN.430 Emergency Locator Transmitter (ELT)		
GENERAL – TYPES OF ELT AND GENERAL TECHNICAL SPECIFICATIONS		
1. The ELT required by this provision should be one of the following:		
a. Automatic Fixed (ELT(AF)). An automatically activated ELT which is permanently attached to an aircraft and is designed to aid SAR teams in locating the crash site;		
b. Automatic Portable (ELT(AP)). An automatically activated ELT, which is rigidly attached to an aircraft before a crash, but is readily removable from the aircraft after a crash. It functions as an ELT during the crash sequence. If the ELT does not employ an integral antenna, the aircraft-mounted antenna may be disconnected and an auxiliary antenna (stored on the ELT case) attached to the ELT. The ELT can be tethered to a survivor or a life raft. This type of ELT is intended to aid SAR teams in locating the crash site or survivor(s);		
c. Automatic Deployable (ELT(AD)). An ELT which is rigidly attached to the aircraft before the crash and which 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 in-		

A: Rule	B: Summary of comments	C: Reason for change, remarks
tended to aid SAR teams in locating the crash site; or		
d. Survival ELT (ELT(S)). An ELT which is removable from an aircraft, stowed so as to facilitate its ready use in an emergency, and manually activated by a survivor. An ELT(S) may be activated manually or automatically (e.g. by water activation). It should be designed to be tethered to a life raft or a survivor.		
2. To minimize the possibility of damage in the event of crash impact, the automatic ELT should be rigidly fixed to the aircraft structure, as far aft as is practicable, with its antenna and connections arranged so as to maximize the probability of the signal being transmitted after a crash.		
3. Any ELT carried should operate in accordance with the relevant provisions of ICAO Annex 10, Volume III and should be registered with the national agency responsible for initiating search and rescue or other nominated agency.		
4. ELTs should be able to transmit on 121.5 MegaHertz (MHz) and 406 MHz.	1. (MS: 2; IND: 0; INDIV: 0) The ELT rule does not include the frequency requirement, asking for 121.5 and 406 MHz capability. This, however, is included in AMC OPS.GEN.430 No.2, which is not acceptable.	1. The frequencies are moved to IR level.
AMC OPS.GEN.430.H(b)(2) Emergency Locator Transmitter (ELT)		
ELT(S) - HELICOPTERS		
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).		
GM OPS.GEN.435 Survival equipment – Motor powered aircraft		
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:		
1. Areas so designated by the competent authority responsible for managing search and rescue; or		
2. Areas that are largely uninhabited and where: a. The competent authority responsible for managing search and rescue has not published any information to confirm whether search and rescue would be or would not be especially difficult; and b. The competent authority referred to in 1. does not, as a matter of policy, designate areas as being especially difficult for search and rescue.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
AMC OPS.GEN.435(a)(3) Survival equipment– Motor powered aircraft		
ADDITIONAL SURVIVAL EQUIPMENT	1. (MS: 1; IND: 0; INDIV: 1) The carriage of the knife/ice saw by passenger/crew may conflict with security requirements. Clarify that the knife is part of the aircraft equipment.	1. The requirement is in line with TGL 44. The security aspects were reviewed by the RG and the text confirmed.
1. The following additional survival equipment should be carried when required: a. 500 ml of water for each 4, or fraction of 4, persons on board; b. One knife; c. First Aid Equipment; d. One set of Air/Ground codes;	1. (MS: 0; IND: 2; INDIV: 1) There is a change in the existing requirement. It is proposed to align with AMC OPS 1.835(c):- '2 litres of drinkable water for each 50, or fraction of 50, persons on board provided in durable containers.' Or include alternate means of compliance:- 'A means of making sea water drinkable, for example water purification tablets capable of producing 500ml of water for each 4, or fraction of 4, persons on board'.	1. Accepted, the AMC is modified in line with TGL 44.
2. In addition, when polar conditions are expected, the following should be carried: a. A means for melting snow; b. 1 snow shovel and 1 ice saw; c. 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; d. 1 Arctic/Polar suit for each crew member carried.	1. (MS: 1; IND: 0; INDIV: 0) Polar definition need to be provided	1. Polar conditions should be determined with the competent Authority.
3. If any item of equipment contained in the above list is already carried on board the aircraft in accordance with another requirement, there is no need for this to be duplicated.		
AMC OPS.GEN.440(a) High altitude flights - Oxygen		1. Deleted - not applicable to CAT.IDE.
BREATHING OXYGEN -		
Breathing oxygen should be provided by a quick donning mask (See GM OPS.CAT.440(b)(1)).		
AMC OPS.GEN.440(a)(1)(i) High altitude flights - Oxygen		
PASSENGER OXYGEN SUPPLY BETWEEN 10 000 FT AND 13 000 FT		
On routes where the oxygen is necessary to be carried for 10% of the passengers for the flight time between 10 000 ft and 13 000 ft, the oxygen may be provided by:	1. (MS: 0; INDUS:6; INDIV: 0): "for the flight time between 10 000 ft and 13 000 ft" – wording different from EU-OPS which refers to "not	1. No change – Current NPA wording compliant w/ ACJ OPS 1.770(b)(2)(v) – Paragraph 2.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	exceeding".	
1. a plug-in or drop-out oxygen system with sufficient outlets and dispensing units uniformly distributed throughout the cabin so as to provide oxygen to each passenger at his/her own discretion when seated on his/her assigned seat; or		
2. portable bottles, when a cabin crew member is carried on board such flight.	1. (MS: 0; INDUS: 1; INDIV: 0): It cannot be required to have a cabin crew in order to use the portable bottles of oxygen for non-commercial operations in non-complex A/C.	1. No change – current NPA wording is compliant w/ ACJ OPS 1.770(b)(2)(v) – paragraph 2.
AMC OPS.GEN.440.A(a)(2) High altitude flights - Oxygen		
MAXIMUM ALTITUDE WITHOUT A PASSENGER OXYGEN SYSTEM - AEROPLANES		
For complex motor-powered pressurised aeroplanes and for pressurised aeroplanes used in commercial operations, the maximum altitude up to which an aeroplane can operate without a passenger oxygen system being installed and capable of providing oxygen to each cabin occupant, should be established using an emergency descent profile which takes into account the following conditions:		
1. 17 seconds time delay for pilot's recognition and reaction, including mask donning, for trouble shooting and configuring the aeroplane for the emergency descent (emergency descent data/charts established by the aeroplane manufacturer and published in the Aircraft Flight Manual (AFM), and/or the AFM should be used to ensure uniform application of the option);		
2. Maximum Operational Speed (VMO) or the airspeed approved in the AFM for emergency descent, (emergency descent data/charts established by the aeroplane manufacturer and published in the AFM, and/or AFM should be used to ensure uniform application of the option), whichever is the less;	1. (MS: 0; INDUS: 1; INDIV: 0): Should be the Va speed, as required when structural damage suspected on the emergency descent.	1. No change - current NPA wording is compliant w/ ACJ OPS 1.770(b)(2)(v) - paragraph 1.b.
3. All engines operative;		
4. The estimated mass of the aeroplane at the top of climb.		
GM OPS.GEN.440 High altitude flights - Oxygen		
GENERAL		
The high altitude flights concept is dealt with in detail in the ICAO Manual of Civil Aviation Medicine.	1. (MS: 0; INDUS:6; INDIV: 0): GM to be deleted taking into account the different approaches of the FAA and JAA rules, more "state of the art" that the out-dated ICAO standards on oxygen.	1. Accepted

A: Rule	B: Summary of comments	C: Reason for change, remarks
GM OPS.GEN.440(a)(2)(i) and (a)(3) High altitude flights - Oxygen		1. Deleted - not applicable to CAT.IDE.
DETERMINATION OF THE PROPORTION OF THE PASSENGERS FOR OXYGEN SUPPLY		
1. The determination of the proportion of the passengers for which oxygen should be supplied depends on the circumstances (e.g. maximum altitude, duration of the flight) of the flight to be undertaken and the performance of the aircraft.		
2. For pressurised aircraft not involved in commercial air transport operations, the requirements in Table 1 of OPS.CAT.440 may be used as guidance material.		
GM OPS.GEN.440(b) High altitude flights - Oxygen		
DUTIES ESSENTIAL TO THE SAFE OPERATION OF AN AIRCRAFT		
Flight duties which are essential to the safe operation of an aircraft include at least the control of aircraft in the flight path and the reaction to any normal, abnormal or emergency conditions.		1. Deleted - not applicable to CAT.IDE.
AMC OPS.GEN.450 Marking of break-in points		
COLOUR AND CORNERS' MARKING		
1. The colour of the markings should be red or yellow and, if necessary, should be outlined in white to contrast with the background.		
2. If the corner markings are more than 2 m apart, intermediate lines 9 centimetres (cm) x 3 cm should be inserted so that there is no more than 2 m between adjacent markings.		
AMC1 OPS.GEN.455 First-aid kits		
OTHER THAN COMPLEX MOTOR-POWERED AIRCRAFT AND BALLOONS		
First-Aid Kits (FAKs) according to DIN 13164 or DIN 13157 are considered to meet the objective of OPS.GEN.455.	1. (MS: 1; INDUS: 1; INDIV:2) DIN is a German norm. What about other norms? Proposal: Introduce all other accepted norms in the AMC or international standard. 1. (MS: 0; INDUS: 2; INDIV: 0) Do not refer to document not available to the reader.	1. Accepted. AMC removed.

A: Rule	B: Summary of comments	C: Reason for change, remarks
AMC2 OPS.GEN.455 First-aid kits		
COMPLEX MOTOR-POWERED AIRCRAFT	1. (MS: 0; INDUS: 2; INDIV: 0) The contents of the FAK have been amended and there is no justification. Proposal: remove the amendment and Leave the contents "as is".	1. The first aid kit has been amended a) following the last NPA to JAROPS 1 that did not undergo a full NPA process, and b) taking into account the latest ICAO State letter where amendments to the FAK were introduced. The content of the FAK will include the items of the last amendment to Section 2 of JAR-OPS 1 and be amended to follow ICAO Annex 6 additions that are applicable since 19 November 2009.
1. First-Aid Kits (FAKs) should be equipped with appropriate and sufficient medications and instrumentation. However, these kits should be adapted by the operator according to the characteristics of the operation (scope of operation, flight duration, number and demographics of passengers etc.).	1. (MS: 1; INDUS: 0; INDIV: 0) FAK for CMPA should not be allowed to be adapted to the characteristics of the operation. But no problem if the operator want to add some items. 2. (MS: 0; INDUS: 1; INDIV: 0) Since, according to 1., " these kits should be adapted by the operator according to the characteristics of the operation", does it mean that the equipment and medications presented in 2. are recommended, and not required? IV cannulae and bronchodilator are prescriptive items in some countries, such as USA. The requirement for all presented items may bring the necessity to make different FAKs available for the operators, depending on the country of operation. This will impose a severe burden on operators to have to control the configuration of the onboard FAK on a flight-by-flight basis.	1. Text changed to allow the operator to complement the kit instead of adapting it, to ensure the minimum content. 2. Obligation to carry the items listed in the AMC: The operator may choose to propose an alternative AMC. This must include a risk assessment to provide proof that the alternative MOC provides the same safety level as the AMC published by EASA. This risk assessment must be approved by the CAA concerned.
2. The following should be included in the FAKs:		
a. 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;	1. (MS: 0; INDUS: 2; INDIV: 0) In order to use IV cannulae other equipment is required (such as wipes, a tourniquet an appropriate IV dressing) which are included within the EMK requirements. IV cannulae should be carried in the emergency medical kit only, on medical, security and safety grounds. It is inappropriate to house IV cannulae in a FAK. Proposed text: Delete 2.a.xii	1. IV cannulae should be in the EMK only. None of the medication listed for FAK is injectable. Deletion following comments that asked to go back to "EU-OPS/JAR-OPS 3". Also, IV fluids are in the EMK 2. Tweezers: splinter and thermometers added. These items are in ICAO, Attachment B. Medical Supplies, Supplementary to Chapter 6, 6.2.2a). This is applicable since 19. November 2009. Tweezers: Sensible, but caused a lot of discussion

A: Rule	B: Summary of comments	C: Reason for change, remarks
vii. Safety pins; viii. Scissors; ix. Antiseptic wound cleaner; x. Disposable resuscitation aid; xi. Disposable gloves;		when it was in JAR-OPS 1. It was finally taken out on request of one Member State. It is sensible to place thermometers in the FAK instead of in the EMK.
b. Medications: i. Simple analgesic (may include liquid form); ii. Antiemetic; iii. Nasal decongestant; iv. Gastrointestinal antacid; v. Anti-diarrhoeal medication (for aircraft carrying more than 9 passengers); vi. Bronchial dilator spray.	1. (MS: 0; INDUS: 4; INDIV: 0) A bronchial dilator is a prescription only medication and should not be included in the contents of a first aid kit. It is a new requirement and cannot be justified for inclusion in a first aid kit; such medication is appropriately included in the list for an extended medical kit. Delete paragraph 2.d.vi	1. Applicability criteria corrected in line with JAR-OPS 3 2. A passenger who has an asthma attack during flight needs a bronchial dilator as soon as possible after onset. As passengers sometimes do not take their medication in the hand luggage for security reasons (or simply because they forgot) the bronchial dilator should be accessible also in cases where no "suitably qualified person" is on board to get access to the EMK. Cabin crew must be trained to hand out medication. However, this medication was proposed to be added in the last NPA to JAR-OPS 1 and did not undergo a full NPA. The position at this moment is to revert to EU-OPS where this list was not included. The comment is accepted and the issue will be tabled again in a review of the content of the first aid kit. 3. Gastrointestinal antacid and anti-diarrhoeal requirements amended to reflect TGL 44 content. 4. New item on antihistamine added as per the list of ICAO Annex 6
c. Other: i. A list of contents in at least 2 languages (English and one other). This should include information on the effects and side effects of medications carried; ii. First-aid handbook; iii. Medical incident report form; iv. Biohazard disposal bags; v. Ground/Air visual signal code for use by survivors.	1. (MS: 1; INDUS: 1; INDIV: 0) A ground/air visual signal code for use by survivors is a historical item which has no relevance to safety in the modern era. Justification: The contents list for a first aid kit should only include items which add value and are relevant to current airline operations. Delete paragraph 2.c.v. It has been removed from ICAO Amendment 169 which is effective from November 2009.	1. Not medical - also not in the list of content of first aid kit in ICAO Annex 6. 2. "current edition" added as per the list of ICAO Annex 6
d. An eye irrigator, whilst not required to be carried in the FAK, should, where possible, be available for use on the ground.		
e. For security reasons, items such as scissors should be stored securely.		1. Deleted as covered at Implementing Rule level

A: Rule	B: Summary of comments	C: Reason for change, remarks
AMC OPS.GEN.455(d) First-aid kits		
MAINTENANCE OF FIRST AID KITS		
To be maintained first aid kits should be:		
1. inspected periodically to confirm, to the extent possible, that contents are maintained in the condition necessary for their intended use; and		
2. replenished at regular intervals, in accordance with instructions contained on their labels, or as circumstances warrant.		
GM1 OPS.GEN.460(a) and (b) Airborne Collision Avoidance System (ACAS) II		1. Rules applicable to ACAS are now also covered under published Opinion 05/2010. AUR.ACAS rules in line with ICAO DOC 702014 requirements and taking into account the conclusion of this drafting document.
GENERAL		
1. The ACAS operational procedures and training programmes established by the operator should take into account GM2 OPS.GEN.460(a) and (b). This guidance material incorporates advice contained in: a. ICAO Annex 10, Volume IV ; b. ICAO PANS-OPS, Volume 1 ; c. ICAO PANS-ATM ; and d. ICAO guidance material "ACAS Performance-Based Training Objectives" (published under Attachment E of state letter AN 7/1.3.7.2-97/77).	1. (MS: 0; IND: 1; INDIV: 0) The list of guidance material shown in GM1 was developed and published by the JAA in JAR-OPS 1 ACJ OPS 1.398 many years before ICAO published instructions for the operation of ACAS and training guidelines for pilots in PANS-OPS (Doc 8168). The text of GM2 had its origins in the JAA Temporary Guidance Leaflet 11 (which itself had been based upon Attachment E of ICAO State Letter AN 7/1.3.7.2-97/77, since superseded) and does not now accurately reflect current ICAO guidance. Subsequently, ICAO has published comprehensive instructions for the operation of ACAS and training guidelines for pilots in PANS-OPS, Volume I, Part III, Chapter 3 and Attachments A and B thereto with the specific intention that all pilots of aeroplanes and helicopters that are equipped with ACAS shall be taught and operate this equipment in accordance with exactly the same instructions. Note should be taken of ICAO Annex 6 Part II, Chapter 9, paragraph 9.1.2 that was designed to include pilots of aeroplanes whose operation would not necessarily be governed by an 'operations manual' (eg General Aviation). To address this omission in the NPA, and to retain the requirement that operators should specify identical procedures and training, the suggested replacement text below makes use of	1. The GM is updated to better reflect the referenced document and to address the general aviation ICAO Annex 6 Part II, Chapter 9, paragraph 9.1.2 requirements. 2. The GM is updated to align with the proposed change.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	words published in the Annex 6 Part II Standard. References in the NPA GM2 to TCAS II Version 6.04A and to ACAS III are redundant. 2. (MS: 0; IND:6;INDIV: 0) This GM only refers to ICAO documents and is not useful. We suggest to delete it.	
2. Additional guidance material on ACAS may be referred to, including information available from such sources as Eurocontrol.		
GM2 OPS.GEN.460(a) and (b) Airborne Collision Avoidance System (ACAS) II	1. (MS: 0; IND: 1; INDIV: 0) It is proposed to replace this GM by inserting as published the entire contents of Attachments A and B to ICAO PANS-OPS (Doc 8168), Volume I, Part III, Chapter 3, replacing the existing NPA texts. It should be noted that the replacement text is largely the same as that published in the NPA but includes revisions that reflect developments and changes introduced since the original JAA TGL 11 text was developed. 2. (MS: 0; IND:6; INDIV: 0) This GM is not related to this regulation. It is not useful and should therefore be deleted. Instead, this guidance material should be put in a separate booklet without a link to this rule.	1. & 2. Rules applicable to ACAS are now also covered under published Opinion 05/2010 AUR.ACAS rules in line with ICAO DOC 702014 requirements and taking into account the conclusion of this drafting document.
ACAS FLIGHT CREW TRAINING PROGRAMMES		
1. During the implementation of ACAS, several operational issues were identified which had been attributed to deficiencies in flight crew training programmes. As a result, the issue of flight crew training has been discussed within the ICAO, which has developed guidelines for operators to use when designing training programmes.		
2. This guidance material contains performance-based training objectives for ACAS II flight crew training. Information contained in this paper related to Traffic Advisories (TAs) is also applicable to ACAS I and ACAS III users. The training objectives cover five areas: theory of operation; pre-flight operations; general in-flight operations; response to TAs; and response to Resolution Advisories (RAs).		
3. The information provided is valid for TCAS II version 6.04A as well as for version 7 (ACAS II). Where differences arise, these are identified.		
4. The performance based training objectives are further divided into the areas of:		

A: Rule	B: Summary of comments	C: Reason for change, remarks
academic training; manoeuvre training; initial evaluation and recurrent qualification. Under each of these four areas, the training material has been separated into those items which are considered essential training items and those which are considered desirable. In each area, objectives and acceptable performance criteria are defined.		
5. ACAS Academic Training: a. This training is typically conducted in a classroom environment. The knowledge demonstrations specified in this section may be completed through the successful completion of written tests or through providing correct responses to non-real-time Computer Based Training (CBT) questions. b. Essential items:		
i. Theory of operation. The flight crew member should demonstrate an understanding of ACAS operation and the criteria used for issuing TAs and RAs. This training should address the following topics:		
A. System operation. Objective: To demonstrate knowledge of how ACAS functions. Criteria: The flight crew member should demonstrate an understanding of the following functions:		
1. Surveillance: a. ACAS interrogates other transponder-equipped aircraft within a nominal range of 14 nautical miles (nm). b. ACAS surveillance range can be reduced in geographic areas with a large number of ground interrogators and/or ACAS II-equipped aircraft. c. If the operator's ACAS implementation provides for the use of the Mode S extended squitter, the normal surveillance range may be increased beyond the nominal 14 nm. However, this information is not used for collision avoidance purposes.		
2. Collision avoidance: a. TAs can be issued against any transponder-equipped aircraft which responds to the ICAO Mode C interrogations, even if the aircraft does not have altitude reporting capability. b. RAs can be issued only against aircraft that are reporting altitude and in the vertical plane only. c. RAs issued against an ACAS-equipped intruder are co-ordinated to ensure complementary RAs are issued. d. Failure to respond to an RA deprives own aircraft of the collision protection provided by own ACAS. e. Additionally, in ACAS-ACAS encounters, it also restricts the choices available to the other aircraft's ACAS and thus renders the other aircraft's ACAS less effective than if own aircraft were not ACAS equipped.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
B. Advisory thresholds. Objective: To demonstrate knowledge of the criteria for issuing TAs and RAs. Criteria: The flight crew member should demonstrate an understanding of the methodology used by ACAS to issue TAs and RAs and the general criteria for the issuance of these advisories, including the following:		
1. ACAS advisories are based on time to Closest Point of Approach (CPA) rather than distance. The time should be short and vertical separation should be small, or projected to be small, before an advisory can be issued. The separation standards provided by air traffic services are different from the miss distances against which ACAS issues alerts;		
2. Thresholds for issuing a TA or an RA vary with altitude. The thresholds are larger at higher altitudes;		
3. A TA occurs from 15 to 48 seconds and an RA from 15 to 35 seconds before the projected CPA;		
4. RAs are chosen to provide the desired vertical miss distance at CPA. As a result, RAs can instruct a climb or descent through the intruder aircraft's altitude.		
C. ACAS limitations. Objective: To verify that the flight crew member is aware of the limitations of ACAS. Criteria: The flight crew member should demonstrate knowledge and understanding of ACAS limitations, including the following:		
1. ACAS will neither track nor display non-transponder-equipped aircraft, nor aircraft not responding to ACAS Mode C interrogations;		
2. ACAS will automatically fail if the input from the aircraft’s barometric altimeter, radio altimeter or transponder is lost. a. In some installations, the loss of information from other on board systems such as an Inertial Reference System (IRS) or Attitude Heading Reference System (AHRS) may result in an ACAS failure. Individual operators should ensure that their flight crews are aware of the types of failure which will result in an ACAS failure. b. ACAS may react in an improper manner when false altitude information is provide to own ACAS or transmitted by another aircraft. Individual operators should ensure that their flight crews are aware of the types of unsafe conditions which can arise. Flight crews should ensure that when they are advised, if their own aircraft is transmitting false altitude reports, an alternative altitude reporting source is selected, or altitude reporting is switched off;		

A: Rule	B: Summary of comments	C: Reason for change, remarks
3. Some aeroplanes within 380 ft above ground level (agl) (nominal value) are deemed to be 'on ground' and will not be displayed. If ACAS is able to determine an aircraft below this altitude is airborne, it will be displayed;		
4. ACAS may not display all proximate transponder-equipped aircraft in areas of high density traffic;		
5. The bearing displayed by ACAS is not sufficiently accurate to support the initiation of horizontal manoeuvres based solely on the traffic display;		
6. ACAS will neither track nor display intruders with a vertical speed in excess of 10 000 ft/min. In addition, the design implementation may result in some short-term errors in the tracked vertical speed of an intruder during periods of high vertical acceleration by the intruder;		
7. Ground Proximity Warning Systems/Ground Collision Avoidance Systems (GPWSs/GCASs) warnings and wind-shear warnings take precedence over ACAS advisories. When either a GPWS/GCAS or wind-shear warning is active, ACAS aural annunciations will be inhibited and ACAS will automatically switch to the 'TA only' mode of operation.		
D. ACAS inhibits. Objective: To verify that the flight crew member is aware of the conditions under which certain functions of ACAS are inhibited. Criteria: The flight crew member should demonstrate knowledge and understanding of the various ACAS inhibits, including the following:		
1. "Increase Descent" RAs are inhibited below 1 450 ft agl;		
2. "Descend" RAs are inhibited below 1 100 ft agl;		
3. All RAs are inhibited below 1 000 ft agl;		
4. All TA aural annunciations are inhibited below 500 ft agl (1 000ft version 6.04A);		
5. Altitude and configuration under which "Climb" and "Increase Climb" RAs are inhibited. ACAS can still issue "Climb" and "Increase Climb" RAs when operating at the aeroplane's certified ceiling. (In some aircraft types, "Climb" or "Increase Climb" RAs are never inhibited.)		
ii. Operating procedures. The flight crew member should demonstrate the knowledge required to operate the ACAS avionics and interpret the information presented by ACAS. This training should address the following:		
A. Use of controls. Objective: To verify that the pilot can properly		

A: Rule	B: Summary of comments	C: Reason for change, remarks
operate all ACAS and display controls.		
Criteria: Demonstrate the proper use of controls including:		
1. Aircraft configuration required to initiate a self-test;		
2. Steps required to initiate a self-test;		
3. Recognising when the self-test was successful and when it was unsuccessful. When the self-test is unsuccessful, recognising the reason for the failure and, if possible, correcting the problem;		
4. Recommended usage of range selection. Low ranges are used in the terminal area and the higher display ranges are used in the en-route environment and in the transition between the terminal and en-route environment;		
5. Recognising that the configuration of the display does not affect the ACAS surveillance volume;		
6. Selection of lower ranges when an advisory is issued, to increase display resolution;		
7. Proper configuration to display the appropriate ACAS information without eliminating the display of other needed information;		
8. If available, recommended usage of the above/below mode selector. The above mode should be used during climb and the below mode should be used during descent;		
9. If available, proper selection of the display of absolute or relative altitude and the limitations of using this display if a barometric correction is not provided to ACAS.		
B. Display interpretation. Objective: To verify that the flight crew member understands the meaning of all information that can be displayed by ACAS. The wide variety of display implementations require the tailoring of some criteria. When the training programme is developed, these criteria should be expanded to cover details for an operator's specific display implementation. Criteria: The flight crew member should demonstrate the ability to properly interpret information displayed by ACAS, including the following:		
1. Other traffic, i.e. traffic within the selected display range that is not proximate traffic, or causing a TA or RA to be issued;		
2. Proximate traffic, i.e. traffic that is within 6 nm and ±1 200 ft;		
3. Non-altitude reporting traffic;		

A: Rule	B: Summary of comments	C: Reason for change, remarks
4. No bearing TAs and RAs;		
5. Off-scale TAs and RAs. The selected range should be changed to 6. TAs. The minimum available display range which allows the traffic to be displayed should be selected, to provide the maximum display resolution;		
7. RAs (traffic display). The minimum available display range of the traffic display which allows the traffic to be displayed should be selected, to provide the maximum display resolution;		
8. RAs (RA display). Flight crew members should demonstrate knowledge of the meaning of the red and green areas or the meaning of pitch or flight path angle cues displayed on the RA display Flight crew members should also demonstrate an understanding of the RA display limitations, i.e. if a vertical speed tape is used and the range of the tape is less than 2 500 ft/min, an increase rate RA cannot be properly displayed;		
9. If appropriate, awareness that navigation displays oriented on "Track-Up" may require a flight crew member to make a mental adjustment for drift angle when assessing the bearing of proximate traffic.		
C. Use of the TA only mode. Objective: To verify that a flight crew member understands the appropriate times to select the TA only mode of operation and the limitations associated with using this mode. Criteria: The flight crew member should demonstrate the following:		
1. Knowledge of the operator's guidance for the use of TA only;		
2. Reasons for using this mode. If TA only is not selected when an airport is conducting simultaneous operations from parallel runways separated by less than 1 200 ft, and to some intersecting runways, RAs can be expected. If for any reason TA only is not selected and an RA is received in these situations, the response should comply with the operator's approved procedures.	1. (MS: 0; IND: 1; INDIV: 0) The detail of the ACAS training as shown in C.2 is outdated, even if may still be included in ICAO GM. OPS.GEN.460 clearly states – in compliance with the current ICAO PANS-OPS – that "ACAS … shall be used in normal conditions during flight in a mode that enables Resolution Advisories (RAs) …" "Normal conditions" do include parallel runway operations, and these situations should no longer be promulgated as cases when to switch off RA. Switching to "TA ONLY" is restricted to "non-normal" or "abnormal" conditions in connection with technical malfunctions that might prevent correct compliance with RAs.	1. The GM on ACAS training is included in CAT.OP. This GM will be further reviewed in a future RM task. The commentator is requested to provide additional elements for revision.
3. All TA aural annunciations are inhibited below 500 ft agl (1 000 ft agl for version 6.04A). As a result, TAs issued below 500 ft agl may not be noticed unless the TA		

A: Rule	B: Summary of comments	C: Reason for change, remarks
display is included in the routine instrument scan.		
D. Crew co-ordination. Objective: To verify that the flight crew member understands how ACAS advisories will be handled. Criteria: The flight crew member should demonstrate knowledge of the crew procedures that should be used when responding to TAs and RAs, including the following: 1. Task sharing between the pilot flying and the pilot not flying; 2. Expected call-outs; 3. Communications with Air Traffic Control (ATC).		
E. Phraseology requirements. Objective: To verify that the flight crew member is aware of the requirements for reporting RAs to the controller. Criteria: The flight crew member should demonstrate the following:		
1. The use of the phraseology contained in ICAO PANS-OPS;		
2. An understanding of the procedures contained in ICAO PANS-ATM and ICAO Annex 2;		
3. The understanding that verbal reports should be made promptly to the appropriate ATC unit: a. whenever any manoeuvre has caused the aeroplane to deviate from an air traffic clearance; b. when, subsequent to a manoeuvre that has caused the aeroplane to deviate from an air traffic clearance, the aeroplane has returned to a flight path that complies with the clearance; and/or c. when air traffic issue instructions that, if followed, would cause the crew to manoeuvre the aircraft contrary to an RA with which they are complying.		
F. Reporting requirements. Objective: To verify that the flight crew member is aware of the requirements for reporting RAs to the operator. Criteria: The flight crew member should demonstrate knowledge of where information can be obtained regarding the need for making written reports to various states when an RA is issued. Various states have different reporting requirements and the material available to the flight crew member should be tailored to the operator's operating environment. For operators involved in commercial operations, this responsibility is satisfied by the flight crew member reporting to the operator according to the applicable reporting requirements.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
c. Non-essential items: Advisory thresholds. Objective: To demonstrate knowledge of the criteria for issuing TAs and RAs. Criteria: The flight crew member should demonstrate an understanding of the methodology used by ACAS to issue TAs and RAs and the general criteria for the issuance of these advisories, including the following:		
i. The minimum and maximum altitudes below/above which TAs will not be issued;		
ii. When the vertical separation at CPA is projected to be less than the ACAS-desired separation, a corrective RA which requires a change to the existing vertical speed will be issued. This separation varies from 300 ft at low altitude to a maximum of 700 ft at high altitude;		
iii. When the vertical separation at CPA is projected to be just outside the ACAS-desired separation, a preventive RA which does not require a change to the existing vertical speed will be issued. This separation varies from 600 to 800 ft;		
iv. RA fixed range thresholds vary between 0.2 and 1.1 nm.		
6. ACAS manoeuvre training:		
a. Demonstration of the flight crew member's ability to use ACAS displayed information to properly respond to TAs and RAs, should be carried out in a flight simulator equipped with an ACAS display and controls similar in appearance and operation to those in the aircraft. If a flight simulator is utilised, CRM should be practised during this training.		
b. Alternatively, the required demonstrations can be carried out by means of an interactive CBT with an ACAS display and controls similar in appearance and operation to those in the aircraft. This interactive CBT should depict scenarios in which real-time responses should be made. The flight crew member should be informed whether or not the responses made were correct. If the response was incorrect or inappropriate, the CBT should show what the correct response should be.		
c. The scenarios included in the manoeuvre training should include: corrective RAs; initial preventive RAs; maintain rate RAs; altitude crossing RAs; increase rate RAs; RA reversals; weakening RAs; and multi-aircraft encounters. The consequences of failure to respond correctly should be demonstrated by reference to actual incidents such as those publicised in Eurocontrol ACAS II 'safety flash' Bulletins.		
i. TA responses. Objective: To verify that the pilot properly interprets and responds to TAs. Criteria: The pilot should demonstrate the following:		
A. Proper division of responsibilities between the pilot flying and the		

A: Rule	B: Summary of comments	C: Reason for change, remarks
pilot not flying. The pilot flying should fly the aircraft using any type-specific procedures and be prepared to respond to any RA that might follow. For aircraft without an RA pitch display, the pilot flying should consider the likely magnitude of an appropriate pitch change. The pilot not flying should provide updates on the traffic location shown on the ACAS display, using this information to help visually acquire the intruder;		
B. Proper interpretation of the displayed information. Flight crew members should confirm that the aircraft they have visually acquired is that which has caused the TA to be issued. Use should be made of all information shown on the display, note being taken of the bearing and range of the intruder (amber circle), whether it is above or below (data tag), and its vertical speed direction (trend arrow);		
C. Other available information should be used to assist in visual acquisition, including ATC "party-line" information, traffic flow in use, etc.;		
D. Because of the limitations described, the pilot flying should not manoeuvre the aircraft based solely on the information shown on the ACAS display. No attempt should be made to adjust the current flight path in anticipation of what an RA would advise, except that if own aircraft is approaching its cleared level at a high vertical rate with a TA present, vertical rate should be reduced to less than 1 500 ft/min;		
E. When visual acquisition is attained, and as long as no RA is received, normal right of way rules should be used to maintain or attain safe separation. No unnecessary manoeuvres should be initiated. The limitations of making manoeuvres based solely on visual acquisition, especially at high altitude or at night, or without a definite horizon should be demonstrated as being understood.		
ii. RA responses. Objective: To verify that the pilot properly interprets and responds to RAs. Criteria: The pilot should demonstrate the following:		
A. Proper response to the RA, even if it is in conflict with an ATC instruction and even if the pilot believes that there is no threat present;		
B. Proper task sharing between the pilot flying and the pilot not flying. The pilot flying should respond to a corrective RA with appropriate control inputs. The pilot not flying should monitor the response to the RA and should provide updates on the traffic location by checking the traffic display. Proper Crew Resource Man-		

A: Rule	B: Summary of comments	C: Reason for change, remarks
agement (CRM) should be used;		
C. Proper interpretation of the displayed information. The pilot should recognise the intruder causing the RA to be issued (red square on display). The pilot should respond appropriately;		
D. For corrective RAs, the response should be initiated in the proper direction within five seconds of the RA being displayed. The change in vertical speed should be accomplished with an acceleration of approximately ¼ g (gravitational acceleration of 9.81 m/sec²);	1. (MS: 1; IND: 0; INDIV: 0) To the non-technical reader this could be interpreted that g itself was actually 4 times 9.81. Furthermore the abbreviation used (m/sec-2) is mathematically incorrect as acceleration is a change in velocity and is metres per second (velocity) per second (m.sec-2 or m/sec2).	1. The GM on ACAS training is included in CAT.OP. This GM will be further reviewed in a future RM task. The commentator is requested to provide additional elements for revision.
E. Recognition of the initially displayed RA being modified. Response to the modified RA should be properly accomplished, as follows:		
1. For increase rate RAs, the vertical speed change should be started within two and a half seconds of the RA being displayed. The change in vertical speed should be accomplished with an acceleration of approximately ⅓ g;		
2. For RA reversals, the vertical speed reversal should be started within two and a half seconds of the RA being displayed. The change in vertical speed should be accomplished with an acceleration of approximately ⅓ g;		
3. For RA weakenings, the vertical speed should be modified to initiate a return towards the original clearance;		
4. An acceleration of approximately ¼ g will be achieved if the change in pitch attitude corresponding to a change in vertical speed of 1 500 ft/min is accomplished in approximately five seconds, and of ⅓ g if the change is accomplished in approximately three seconds. The change in pitch attitude required to establish a rate of climb or descent of 1 500 ft/min from level flight will be approximately six degrees when the True Air Speed (TAS) is 150 kt, four degrees at 250 kt, and two degrees at 500 kt. (These angles are derived from the formula: 1000 divided by TAS.)		
F. Recognition of altitude crossing encounters and the proper response to these RAs;		
G. For preventive RAs, the vertical speed needle or pitch attitude indication, should remain outside the red area on the RA display;		
H. For maintain rate RAs, the vertical speed should not be reduced. Pilots should recognise that a maintain rate RA may result in crossing through the intruder's altitude;		

A: Rule	B: Summary of comments	C: Reason for change, remarks
I. When the RA weakens, or when the green 'fly to' indicator changes position, the pilot should initiate a return towards the original clearance, and when "clear of conflict" is annunciated, the pilot should complete the return to the original clearance;		
J. The controller should be informed of the RA as soon as time and workload permit, using the standard phraseology;		
K. When possible, an ATC clearance should be complied with while responding to an RA. For example, if the aircraft can level at the assigned altitude while responding to RA (an "adjust vertical speed" RA (version 7), "reduce climb" or "reduce descent" RA (version 6.04A), it should be done; the horizontal (turn) element of an ATC instruction should be followed;		
L. Knowledge of the ACAS multi-aircraft logic and its limitations, and that ACAS can optimise separations from two aircraft by climbing or descending towards one of them. For example, ACAS only considers intruders which it considers to be a threat when selecting an RA. As such, it is possible for ACAS to issue an RA against one intruder which results in a manoeuvre towards another intruder which is not classified as a threat. If the second intruder becomes a threat, the RA will be modified to provide separation from that intruder.		
7. ACAS initial evaluation:		
a. The flight crew member's understanding of the academic training items should be assessed by means of a written test or interactive CBT that records correct and incorrect responses to phrased questions.		
b. The flight crew member's understanding of the manoeuvre training items should be assessed in a flight simulator equipped with an ACAS display and controls similar in appearance and operation to those in the aircraft the flight crew member will fly, and the results assessed by a qualified instructor, inspector, or check airman. The range of scenarios should include: corrective RAs; initial preventive RAs; maintain rate RAs; altitude crossing RAs; increase rate RAs; RA reversals; weakening RAs; and multi-threat encounters. The scenarios should also include demonstrations of the consequences of not responding to RAs, slow or late responses, and manoeuvring opposite to the direction called for by the displayed RA.	1. (MS: 0; IND: 1; INDIV: 0) ECA does not recognize the figure of check airman.	1. Reference to "check airman" is deleted.
c. Alternatively, exposure to these scenarios can be conducted by means of an interactive CBT with an ACAS display and controls similar in appearance and operation to those in the aircraft the pilot will fly. This interactive CBT should depict scenarios in which real-time responses should be made and a record made of whether or not each response was correct.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
8. ACAS recurrent training:		
a. ACAS recurrent training ensures that flight crew members maintain the appropriate ACAS knowledge and skills. ACAS recurrent training should be integrated into and/or conducted in conjunction with other established recurrent training programmes. An essential item of recurrent training is the discussion of any significant issues and operational concerns that have been identified by the operator. Recurrent training should also address changes to ACAS logic, parameters or procedures and to any unique ACAS characteristics which flight crew members should be made aware of.		
b. It is recommended that operator's recurrent training programmes using flight simulators include encounters with conflicting traffic when these simulators are equipped with ACAS. The full range of likely scenarios may be spread over a two-year period. If a flight simulator, as described above, is not available, use should be made of an interactive CBT that is capable of presenting scenarios to which pilot responses should be made in real-time.	1. (MS: 0; IND:6;INDIV: 0) Requirement to train the full range of scenarios over a two year period is very restrictive and does not comply with the spirit of the GM principle.	1. The GM on ACAS training is included in CAT.OP. This GM will be further reviewed in a future RM task. The commentator is requested to provide additional elements for revision.
AMC OPS.GEN.465.A(c) Terrain Awareness Warning System (TAWS) - Aeroplanes		1. AMC deleted as per changes made in the IR.
TAWS WARNING		
The warning referred in OPS.GEN.465.A(c) should be provided by aural signals that may be supplemented by visual signals.		
GM1 OPS.GEN.465.A Terrain Awareness Warning System (TAWS) - Aeroplanes		
TAWS CLASS A AND TAWS CLASS B	1. (MS: 0; IND: 6; INDIV: 0) The minimum performance standard should at least be defined in an AMC. Proposal: Upgrade to AMC	1. Accepted. Applicable ETSOs are mentioned at IR level.
The minimum performance standards for TAWS Class A and TAWS Class B equipment are described in the Agency's ETSO-C151a .		
GM2 OPS.GEN.465.A Terrain Awareness Warning System (TAWS) - Aeroplanes	1. (MS: 0; INDUS: 12;INDIV: 0) Those GMs have nothing to do with the regulation. It's only informative and technical Proposal: Put it in a separate document (best practices, booklet, notice …). Too much detail and requirements. It does not comply with the spirit of the GM principle.	1. Accepted. The material has been moved to CAT.OP.
GUIDANCE MATERIAL FOR TAWS FLIGHT CREW TRAINING PROGRAMMES		

A: Rule	B: Summary of comments	C: Reason for change, remarks
1. Introduction:		
a. This guidance material contains performance-based training objectives for TAWS flight crew training.		
b. The training objectives cover five areas: theory of operation; pre-flight operations; general in-flight operations; response to TAWS cautions; and response to TAWS warnings.		
c. The term 'TAWS' in this guidance material means a Ground Proximity Warning System (GPWS) enhanced by a forward-looking terrain avoidance function. Alerts include both cautions and warnings.		
d. The content of this guidance material is intended to assist operators who are producing training programmes. The information it contains has not been tailored to any specific aircraft or TAWS equipment, but highlights features which are typically available where such systems are installed. It is the responsibility of the individual operator to determine the applicability of the content of this guidance material to each aircraft and TAWS equipment installed and their operation. Operators should refer to the AFM and/or Aircraft/Flight Crew Operating Manual A/FCOM, or similar documents, for information applicable to specific configurations. If there should be any conflict between the content of this guidance material and that published in the other documents described above, then information contained in the AFM or A/FCOM will take precedence.		
2. Scope:		
a. The scope of this guidance material is designed to identify training objectives in the areas of: academic training; manoeuvre training; initial evaluation; and recurrent qualification. Under each of these four areas, the training material has been separated into those items which are considered essential training items and those which are considered to be desirable. In each area, objectives and acceptable performance criteria are defined.		
b. No attempt is made to define how the training programme should be implemented. Instead, objectives are established to define the knowledge that a pilot operating a TAWS is expected to possess and the performance expected from a pilot who has completed TAWS training. However, the guidelines do indicate those areas in which the pilot receiving the training should demonstrate his/her understanding, or performance, using a real-time, interactive training device, ie a flight simulator. Where appropriate notes are included within the performance criteria which amplify or clarify the material addressed by the training objective.		
3. Performance-based training objectives:		
a. TAWS academic training:		

A: Rule	B: Summary of comments	C: Reason for change, remarks
i. This training is typically conducted in a classroom environment. The knowledge demonstrations specified in this section may be completed through the successful completion of written tests or by providing correct responses to non-real-time CBT questions.		
ii. Theory of operation. The pilot should demonstrate an understanding of TAWS operation and the criteria used for issuing cautions and warnings. This training should address system operation. Objective: To demonstrate knowledge of how a TAWS functions. Criteria: The pilot should demonstrate an understanding of the following functions:		
A. Surveillance:		
1. The GPWS computer processes data supplied from an air data computer, a radio altimeter, an Instrument Landing System (ILS)/Microwave Landing System(MLS)/Multi-Mode (MM) receiver, a roll attitude sensor, and flap and gear selector position sensors.	1. (MS: 0; INDUS: 1; INDIV: 0) It should not sense the flap and gear selector position, but the actual position of the surfaces and of the landing gear.	1. Accepted
2. The forward looking terrain avoidance function utilises an accurate source of known aircraft position, such as that which may be provided by a Flight Management System (FMS) or GPS, or an electronic terrain database. The source and scope of the terrain, obstacle and airport data, and features such as the terrain clearance floor, the runway picker, and geometric altitude (where provided), should all be described.		
3. Displays required to deliver TAWS outputs include a loudspeaker for voice announcements, visual alerts (typically amber and red lights), and a terrain awareness display (that may be combined with other displays). In addition, means should be provided for indicating the status of the TAWS and any partial or total failures that may occur.		
B. Terrain avoidance. Outputs from the TAWS computer provide visual and audio synthetic voice cautions and warnings to alert the flight crew about potential conflicts with terrain and obstacles.		
C. Alert thresholds. Objective: To demonstrate knowledge of the criteria for issuing cautions and warnings. Criteria: The pilot should be able to demonstrate an understanding of the methodology used by a TAWS to issue cautions and alerts and the general criteria for the issuance of these alerts, including:		
1. basic GPWS alerting modes specified in the ICAO Standard: Mode 1: excessive sink rate; Mode 2: excessive terrain closure rate;		

A: Rule	B: Summary of comments	C: Reason for change, remarks
Mode 3: descent after take-off or go-around; Mode 4: unsafe proximity to terrain; Mode 5: descent below ILS glide slope (caution only); and		
2. an additional, optional alert mode:- Mode 6: radio altitude call-out (information only); TAWS cautions and warnings which alert the flight crew to obstacles and terrain ahead of the aircraft in line with or adjacent to its projected flight path (Forward-Looking Terrain Avoidance (FLTA) and Premature Descent Alert (PDA) functions).		
D. TAWS limitations. Objective: To verify that the pilot is aware of the limitations of TAWS. Criteria: The pilot should demonstrate knowledge and an understanding of TAWS limitations identified by the manufacturer for the equipment model installed, such as:		
1. navigation should not be predicated on the use of the terrain display;		
2. unless geometric altitude data is provided, use of predictive TAWS functions is prohibited when altimeter subscale settings display 'QFE';		
3. nuisance alerts can be issued if the aerodrome of intended landing is not included in the TAWS airport database;		
4. in cold weather operations, corrective procedures should be implemented by the pilot unless the TAWS has in-built compensation, such as geometric altitude data;		
5. loss of input data to the TAWS computer could result in partial or total loss of functionality. Where means exist to inform the flight crew that functionality has been degraded, this should be known and the consequences understood;		
6. radio signals not associated with the intended flight profile (eg ILS glide path transmissions from an adjacent runway) may cause false alerts;		
7. inaccurate or low accuracy aircraft position data could lead to false or non-annunciation of terrain or obstacles ahead of the aircraft; and		
8. Minimum Equipment List (MEL) restrictions should be applied in the event of the TAWS becoming partially or completely unserviceable. (It should be noted that basic GPWS has no forward-looking capability.)		
E. TAWS inhibits. Objective: To verify that the pilot is aware of the conditions under which certain functions of a TAWS are inhibited. Criteria: The pilot should demonstrate knowledge and an understanding of the various TAWS inhibits, including the following:		
1. A means of silencing voice alerts;		

A: Rule	B: Summary of comments	C: Reason for change, remarks
2. A means of inhibiting ILS glide path signals (as may be required when executing an ILS back beam approach);		
3. A means of inhibiting flap position sensors (as may be required when executing an approach with the flaps not in a normal position for landing);		
4. A means of inhibiting the FLTA and PDA functions;		
5. A means of selecting or deselecting the display of terrain information, together with appropriate annunciation of the status of each selection.		
b. Operating procedures. The pilot should demonstrate the knowledge required to operate TAWS avionics and to interpret the information presented by a TAWS. This training should address the following topics:		
i. Use of controls. Objective: To verify that the pilot can properly operate all TAWS controls and inhibits. Criteria: The pilot should demonstrate the proper use of controls, including the following:		
A. The means by which, before flight, any equipment self-test functions can be initiated;		
B. The means by which TAWS information can be selected for display;		
C. The means by which all TAWS inhibits can be operated and what the consequent annunciations mean with regard to loss of functionality.		
ii. Display interpretation. Objective: To verify that the pilot understands the meaning of all information that can be annunciated or displayed by a TAWS. Criteria: The pilot should demonstrate the ability to properly interpret information annunciated or displayed by a TAWS, including the following:		
A. Knowledge of all visual and aural indications that may be seen or heard;		
B. Response required on receipt of a caution;		
C. Response required on receipt of a warning;		
D. Response required on receipt of a notification that partial or total failure of the TAWS has occurred (including annunciation that the present aircraft position is of low accuracy).		
iii. Use of basic GPWS or use of the FLTA function only. Objective: To veri-		

A: Rule	B: Summary of comments	C: Reason for change, remarks
fy that the pilot understands what functionality will remain following loss of the GPWS or of the FLTA function. Criteria: The pilot should demonstrate knowledge of the following:		
A. How to recognise un-commanded loss of the GPWS function, or how to isolate this function and how to recognise the level of the remaining Controlled Flight Into Terrain (CFIT) protection (essentially, this is the FLTA function);		
B. How to recognise un-commanded loss of the FLTA function, or how to isolate this function and how to recognise the level of the remaining CFIT protection (essentially, this is the basic GPWS).		
iv. Crew co-ordination. Objective: To verify that the pilot adequately briefs other flight crew members on how TAWS alerts will be handled. Criteria: The pilot should demonstrate that the pre-flight briefing addresses procedures that will be used in preparation for responding to TAWS cautions and warnings, including the following:		
A. The action to be taken, and by whom, in the event that a TAWS caution and/or warning is issued;		
B. How multi-function displays will be used to depict TAWS information at take-off, in the cruise and for the descent, approach, landing (and any go-around). This will be in accordance with procedures specified by the operator, who will recognise that it may be more desirable that other data is displayed at certain phases of flight and that the terrain display has an automatic 'pop-up' mode in the event that an alert is issued.		
v. Reporting requirements. Objective: To verify that the pilot is aware of the requirements for reporting alerts to the controller and other authorities. Criteria: The pilot should demonstrate knowledge of the following:		
A. When, following recovery from a TAWS alert or caution, a transmission of information should be made to the appropriate air traffic control unit;		
B. The type of written report which is required, how it is to be compiled, and whether any cross reference should be made in the aircraft technical log and/or voyage report (in accordance with procedures specified by the operator), following a flight in which the aircraft flight path has been modified in response to a TAWS alert, or if any part of the equipment appears not to have functioned correctly.	1. (MS: 0; INDUS: 6; INDIV: 0) It does not make sense to report in the ATL as there's no technical problem. No MEL reference can be made. Proposal: Remove last part of sentence	1. Text amended to refer to operator's occurrence reporting scheme.

A: Rule	B: Summary of comments	C: Reason for change, remarks
vi. Alert thresholds. Objective: To demonstrate knowledge of the criteria for issuing cautions and warnings. Criteria: The pilot should be able to demonstrate an understanding of the methodology used by a TAWS to issue cautions and warnings and the general criteria for the issuance of these alerts, including:		
A. awareness of the modes associated with basic GPWS, including the input data associated with each; and		
B. awareness of the visual and aural annunciations that can be issued by TAWS and how to identify which are cautions and which are warnings.		
c. TAWS manoeuvre training. The pilot should demonstrate the knowledge required to respond correctly to TAWS cautions and warnings. This training should address the following topics:		
i. Response to cautions:		
A. Objective: To verify that the pilot properly interprets and responds to cautions. Criteria: The pilot should demonstrate an understanding of the need, without delay:		
1. to initiate action required to correct the condition which has caused the TAWS to issue the caution and to be prepared to respond to a warning, if this should follow; and		
2. if a warning does not follow the caution, to notify the controller of the new position, heading and/or altitude/flight level of the aircraft, and what the pilot-in-command intends to do next.		
B. The correct response to a caution might require the pilot:		
1. to reduce a rate of descent and/or to initiate a climb;		
2. to regain an ILS glide path from below, or to inhibit a glide path signal if an ILS is not being flown;		
3. to select more flap, or to inhibit a flap sensor if the landing is being conducted with the intent that the normal flap setting will not be used;		
4. to select gear down; and/or		
5. to initiate a turn away from the terrain or obstacle ahead and towards an area free of such obstructions if a forward-looking terrain display indicates that this would be a good solution and the entire manoeuvre can be carried out in clear visual conditions.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
ii. Response to warnings. Objective: To verify that the pilot properly interprets and responds to warnings. Criteria: The pilot should demonstrate an understanding of the following:		
A. The need, without delay, to initiate a climb in the manner specified by the operator;		
B. The need, without delay, to maintain the climb until visual verification can be made that the aircraft will clear the terrain or obstacle ahead or until above the appropriate sector safe altitude (if certain about the location of the aircraft with respect to terrain) even if the TAWS warning stops. If, subsequently, the aircraft climbs up through the sector safe altitude, but the visibility does not allow the flight crew to confirm that the terrain hazard has ended, checks should be made to verify the location of the aircraft and to confirm that the altimeter subscale settings are correct;		
C. When the workload permits, that the flight crew should notify the air traffic controller of the new position and altitude/flight level, and what the pilot-in-command intends to do next;		
D. That the manner in which the climb is made should reflect the type of aircraft and the method specified by the aircraft manufacturer (which should be reflected in the operations manual) for performing the escape manoeuvre. Essential aspects will include the need for an increase in pitch attitude, selection of maximum thrust, confirmation that external sources of drag (e.g. spoilers/speed brakes) are retracted, and respect of the stick shaker or other indication of eroded stall margin;		
E. That TAWS warnings should never be ignored. However, the pilot's response may be limited to that which is appropriate for a caution, only if:	1. (MS: 0; INDUS: 10; INDIV: 0) Text of E. should be moved to operational requirements.	1. Accepted
1. the aircraft is being operated by day in clear, visual conditions; and		
ii. it is immediately clear to the pilot that the aircraft is in no danger in respect of its configuration, proximity to terrain or current flight path.		
d. TAWS initial evaluation:		
i. The flight crew member's understanding of the academic training items should be assessed by means of a written test.		
ii. The flight crew member's understanding of the manoeuvre training items should be assessed in a flight simulator equipped with TAWS vis-		

A: Rule	B: Summary of comments	C: Reason for change, remarks
ual and aural displays and inhibit selectors similar in appearance and operation to those in the aircraft which the pilot will fly. The results should be assessed by a synthetic flight instructor, synthetic flight examiner, type rating instructor or type rating examiner.		
iii. The range of scenarios should be designed to give confidence that proper and timely responses to TAWS cautions and warnings will result in the aircraft avoiding a CFIT accident. To achieve this objective, the pilot should demonstrate taking the correct action to prevent a caution developing into a warning and, separately, the escape manoeuvre needed in response to a warning. These demonstrations should take place when the external visibility is zero, though there is much to be learnt if, initially, the training is given in 'mountainous' or 'hilly' terrain with clear visibility. This training should comprise a sequence of scenarios, rather than be included in Line Orientated Flying Training (LOFT).		
iv. A record should be made, after the pilot has demonstrated competence, of the scenarios that were practised.		
e. TAWS recurrent training:		
i. TAWS recurrent training ensures that pilots maintain the appropriate TAWS knowledge and skills. In particular, it reminds pilots of the need to act promptly in response to cautions and warnings, and of the unusual attitude associated with flying the escape manoeuvre.		
ii. An essential item of recurrent training is the discussion of any significant issues and operational concerns that have been identified by the operator. Recurrent training should also address changes to TAWS logic, parameters or procedures and to any unique TAWS characteristics of which pilots should be aware.		
f. Reporting procedures:		
i. Verbal reports. Verbal reports should be made promptly to the appropriate air traffic control unit:		
A. whenever any manoeuvre has caused the aircraft to deviate from an air traffic clearance;		
B. when, following a manoeuvre which has caused the aircraft to deviate from an air traffic clearance, the aircraft has returned to a flight path which complies with the clearance; and/or		
C. when an air traffic control unit issues instructions which, if followed, would cause the pilot to manoeuvre the aircraft towards terrain or obstacle or it would appear from the display that a po-		

A: Rule	B: Summary of comments	C: Reason for change, remarks
tential CFIT occurrence is likely to result.		
ii. Written reports. Written reports should be submitted in accordance with the operator's occurrence reporting scheme and they also should be recorded in the aircraft technical log:		
A. whenever the aircraft flight path has been modified in response to a TAWS alert (false, nuisance or genuine);		
B. whenever a TAWS alert has been issued and is believed to have been false; and/or		
C. if it is believed that a TAWS alert should have been issued, but was not.		
iii. Within this guidance material, and with regard to reports:		
A. the term 'false' means that the TAWS issued an alert which could not possibly be justified by the position of the aircraft in respect to terrain and it is probable that a fault or failure in the system (equipment and/or input data) was the cause;		
B. the term 'nuisance' means that the TAWS issued an alert which was appropriate, but was not needed because the flight crew could determine by independent means that the flight path was, at that time, safe;		
C. the term 'genuine' means that the TAWS issued an alert which was both appropriate and necessary; and		
D. the report terms described in GM2 OPS.GEN.A.465 3.f.iii are only meant to be assessed after the occurrence is over, to facilitate subsequent analysis, the adequacy of the equipment and the programmes it contains. The intention is not for the flight crew to attempt to classify an alert into any of these three categories when visual and/or aural cautions or warnings are annunciated.		
AMC OPS.GEN.485.A Crash axes and crowbars - Aeroplanes	1. (MS=1; INDUS=1; INDIV=0) The content of this AMC was in the rule text of OPS 1.795 (b). 2. (MS: 1; INDUS: 0; INDIV: 0) Move to CAT requirements OPS.CAT.485.A Crash axes and crowbars.	1. Accepted
POSITION OF CRASH AXES AND CROWBARS FOR AEROPLANES USED IN COMMERCIAL		

<table>
<tr><th>A: Rule</th><th>B: Summary of comments</th><th>C: Reason for change, remarks</th></tr>
<tr><td>AIR TRANSPORT OPERATIONS</td><td></td><td></td></tr>
<tr><td>For aeroplanes used in commercial air transport operations, crash axes and crowbars located in the passenger compartment should be stored in a position not visible to passengers.</td><td></td><td></td></tr>
<tr><td>AMC1 OPS.GEN.490.A Flight data recorder - Aeroplanes</td><td></td><td></td></tr>
<tr><td>LIST OF PARAMETERS TO BE RECORDED FOR AEROPLANES FIRST ISSUED WITH AN INDIVIDUAL CERTIFICATE OF AIRWORTHINESS ON OR AFTER 1 JANUARY 2010</td><td>1. (MS: 0; INDUS:2; INDIV: 0)
The applicability date of 2010 is too early; it should be postponed to avoid costly retrofits.</td><td>1. Regulatory justification
It is proposed to postpone the applicability to 2016, in accordance with the postponement of the applicability date of the corresponding IR.</td></tr>
<tr><td>1. The Flight Data Recorder (FDR) should, with reference to a timescale, record:
a. the parameters listed in Table 1 of AMC1 OPS.GEN.490.A;
b. the additional parameters listed in Table 2 of AMC1 OPS.GEN.490.A, when the information data source for the parameter is either used by aeroplane systems or is available on the instrument panel for use by the flight crew to operate the aeroplane; and
c. any dedicated parameters related to novel or unique design or operational characteristics of the aeroplane, as determined by the competent authority responsible for the type certification or supplemental type certification.</td><td></td><td></td></tr>
<tr><td>2. The parameters to be recorded should meet the performance specifications (designated ranges, sampling intervals, accuracy limits and minimum resolution in read-out) as defined in the relevant tables of the European Organisation for Civil Aviation Equipment (EUROCAE) ED-112.</td><td></td><td></td></tr>
<tr><td>Table 1 of AMC1 OPS.GEN.490.A</td><td></td><td>1. This table is a copy-paste of Table 1 of AMC1 OPS.GEN.490.A of NPA2009-2b.</td></tr>
<tr><td>
<table>
<tr><th>No.*</th><th>Parameter</th></tr>
<tr><td>1a
1b
1c</td><td>Time; or
Relative time count
Global Navigation Satellite System (GNSS) time synchronisation</td></tr>
<tr><td>2</td><td>Pressure altitude</td></tr>
<tr><td>3a
3b</td><td>Indicated air speed; or
Calibrated air speed</td></tr>
<tr><td>4</td><td>Heading (primary flight crew reference) - when true or magnetic heading can be selected, the primary heading reference,</td></tr>
</table>
</td><td></td><td></td></tr>
</table>

A: Rule		B: Summary of comments	C: Reason for change, remarks
	a discrete indicating selection, should be recorded		
5	Normal acceleration		
6	Pitch attitude		
7	Roll attitude		
8	Manual radio transmission keying and Cockpit Voice Recorder (CVR)/FDR synchronisation reference.		
9 9a 9b	Engine thrust/power Parameters required to determine propulsive thrust/power on each engine Cockpit thrust/power lever position for aeroplanes with non-mechanically linked cockpit - engine control		
14	Total or Outside Air Temperature (OAT)		
16	Longitudinal acceleration (body axis)		
17	Lateral acceleration		
18 18a 18b 18c	Primary flight control surface and primary flight control pilot input (for multiple or split surfaces, a suitable combination of inputs is acceptable in lieu of recording each surface separately. For aeroplanes which have a flight control break-away capability that allows either pilot to operate the controls independently, record both inputs): pitch axis roll axis yaw axis		
19	Pitch trim surface position		
23	Marker beacon passage		
24	Warnings - in addition to the master warning each “red” warning (including smoke warnings from other compartments) should be recorded when the warning condition cannot be determined from other parameters or from the CVR		
25	Each navigation receiver frequency selection		
27	Air - ground status and, if the sensor is installed, each landing		

A: Rule	B: Summary of comments	C: Reason for change, remarks
<table><tr><td></td><td>gear</td></tr><tr><td>38</td><td>Selected barometric setting - to be recorded for the aeroplane in which the parameter is displayed electronically</td></tr><tr><td>44</td><td>Selected flight path (all pilot selectable modes of operation) - to be recorded for the aeroplane in which the parameter is displayed electronically</td></tr><tr><td>45</td><td>Selected decision height - to be recorded for the aeroplane in which the parameter is displayed electronically</td></tr><tr><td>75 75a 75b 75c</td><td>All cockpit flight control input forces (for fly-by-wire flight control systems, where control surface position is a function of the displacement of the control input device only, it is not necessary to record this parameter): Control wheel Control column Rudder pedal cockpit input forces</td></tr></table>		
* The number in the left hand column reflects the serial number depicted in EUROCAE ED-112.		
Table 2 of AMC1 OPS.GEN.490.A Aeroplanes for which the information data source for the parameter is either used by aeroplane systems or is available on the instrument panel for use by the flight crew to operate the aeroplane.		1. This table is a copy-paste of Table 2 of AMC1 OPS.GEN.490.A
<table><tr><th>No.*</th><th>Parameter</th></tr><tr><td>10</td><td>Flaps: Trailing edge flap position and cockpit control selection</td></tr><tr><td>11</td><td>Slats: Leading edge flap (slat) position and cockpit control selection</td></tr><tr><td>12</td><td>Thrust reverse status</td></tr><tr><td>13 13a 13b 13c 13d</td><td>Ground spoiler and speed brake Ground spoiler position Ground spoiler selection Speed brake position Speed brake selection</td></tr></table>	1. (MS: 1; INDUS: 0; INDIV: 0) Align parameters 21 and 22 with table II-A.1 of EUROCAE ED 112.	1. Regulatory justification: NPA-OPS 39B, Appendix 1 to ACJ OPS 1.712, table 1 request for "Vertical deviation*: ILS glide path, MLS elevation, GNSS approach path/IRNAV Vertical deviation, as in EUROCAE document 112, table II-A.1.

A: Rule		B: Summary of comments	C: Reason for change, remarks
15	Autopilot/autothrottle/Automatic Flight Control System (AFCS) mode and engagement status		
20	Radio altitude. For autoland/Category 3 operations, each radio altimeter should be recorded. It is acceptable to arrange them so that at least one is recorded every second.		
21 21a 21b 21c	Vertical deviation - the approach aid in use should be recorded. For autoland/Category 3 operations, each system should be recorded. It is acceptable to arrange them so that at least one is recorded every second). ILS glide path MLS elevation GNSS approach path/IRNAV vertical deviation		
22 22a 22b 22c	Horizontal deviation - the approach aid in use should be recorded. For auto land/Category 3 operations, each system should be recorded. It is acceptable to arrange them so that at least one is recorded every second). ILS localiser MLS azimuth GNSS approach path/IRNAV lateral deviation		
26	DME 1 and 2 distances	1. (MS: 0; INDUS: 1; INDIV: 0) Item 26 should contain GLS distance to threshold	1. Regulatory justification: This parameter definition was made consistent with table II-A.1 of ED 112. Note: it did not appear in NPA-OPS 39B, Appendix 1 to ACJ OPS 1.712, table 1.
28 28a 28b 28c	GPWS/TAWS/GCAS status: Selection of terrain display mode, including pop-up display status Terrain alerts, including cautions and warnings and advisories On/off switch position		
29	Angle of attack		
30 30a 30b	Low pressure warning (each system): Hydraulic pressure Pneumatic pressure		
31	Ground speed		
32 32a	Landing gear: Landing gear		

A: Rule			B: Summary of comments	C: Reason for change, remarks
32b	Gear selector position			
33	Navigation data:			
33a	Drift angle			
33b	Wind speed			
33c	Wind direction			
33d	Latitude			
33e	Longitude			
33f	GNSS augmentation in use			
34	Brakes:			
34a	Left and right brake pressure			
34b	Left and right brake pedal position			
35	Additional engine parameters (if not already recorded in parameter 9 of Table 1 of AMC1 OPS.GEN.490.A and if the aeroplane is equipped with a suitable data source):			
35a	Engine Pressure Ratio (EPR)			
35b	N_1			
35c	Indicated vibration level			
35d	N_2			
35e	Exhaust Gas Temperature (EGT)			
35f	Fuel flow			
35g	Fuel cut-off lever position			
35h	N_3			
36	Traffic Alert and Collision Avoidance System (TCAS)/ACAS - a suitable combination of discrete should be recorded to determine the status of system:		1. (MS: 0; INDUS: 1; INDIV: 0) Parameter 38: it should be added selected barometric setting.	1. Editorial: The parameter definition that appears in table II-A.1 of ED 112 was only partially transcribed here. In NPA-OPS 39B, Appendix 1 to ACJ OPS 1.712, table 1, "Selected Barometric Setting" appears.
36a	Combined control			
36b	Vertical control			
36c	Up advisory			
36d	Down advisory			
36e	Sensitivity level			
37	Wind-shear warning			

A: Rule		B: Summary of comments	C: Reason for change, remarks
38a 38b	Pilot First officer		
39	Selected altitude (All pilot selectable modes of operation) - to be recorded for the aeroplane where the parameter is displayed electronically		
40	Selected speed (All pilot selectable modes of operation) - to be recorded for the aeroplane where the parameter is displayed electronically		
41	Selected Mach (All pilot selectable modes of operation) - to be recorded for the aeroplane where the parameter is displayed electronically		
42	Selected vertical speed (All pilot selectable modes of operation) - to be recorded for the aeroplane where the parameter is displayed electronically		
43	Selected heading (All pilot selectable modes of operation) - to be recorded for the aeroplane where the parameter is displayed electronically		
44a 44b 44c	Course/DSTRK Path angle Co-ordinates of final approach path (IRNAV/IAN)		
46 46a 46b	Electronic Flight Instrument System (EFIS) display format: Pilot First Officer		
47	Multi-function/engine/alerts display format		
48	AC electrical bus status - each bus		
49	DC electrical bus status - each bus		
50	Engine bleed valve position		
51	APU bleed valve position		
52	Computer failure - critical flight and engine control system		
53	Engine thrust command		

A: Rule		B: Summary of comments	C: Reason for change, remarks
54	Engine thrust target		
55	Computed centre of gravity		
56	Fuel quantity or fuel quantity in CG trim tank		
57	Head up display in use		
58	Para visual display on		
59	Operational stall protection, stick shaker and pusher activation		
60 60a 60b 60c 60d 60e 60f	Primary navigation system reference: GNSS Inertial Navigational System (INS) VOR/DME MLS Loran C ILS		
61	Ice detection		
62	Engine warning - each engine vibration		
63	Engine warning - each engine over temperature		
64	Engine warning - each engine oil pressure low		
65	Engine warning - each engine over speed		
66	Yaw trim surface position		
67	Roll trim surface position		
68	Yaw or sideslip angle		
69	De-icing and/or anti-icing systems selection		
70	Hydraulic pressure - each system		
71	Loss of cabin pressure *		
72	Cockpit trim control input position pitch - when mechanical means for control inputs are not available, cockpit display		

A: Rule	B: Summary of comments	C: Reason for change, remarks

	trim positions or trim command should be recorded
73	Cockpit trim control input position roll - when mechanical means for control inputs are not available, cockpit display trim positions or trim command should be recorded
74	Cockpit trim control input position yaw - when mechanical means for control inputs are not available, cockpit display trim positions or trim command should be recorded
76	Event marker
77	Date
78	ANP or EPE or EPU

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

AMC2 OPS.GEN.490.A Flight data recorder - Aeroplanes

LIST OF PARAMETERS TO BE RECORDED FOR AEROPLANES FIRST ISSUED WITH AN INDIVIDUAL CERTIFICATE OF AIRWORTHINESS ON OR AFTER 1 APRIL 1998

1. The FDR should, with reference to a timescale, record:
   a. the parameters listed in Table 1 of AMC2 OPS.GEN.490.A, for those aeroplanes with a maximum certificated take-off mass of more than 5 700 kg and first issued with an individual certificate of airworthiness after 1 January 2005;
   b. the parameters listed in Table 2 of AMC2 OPS.GEN.490.A, for those aeroplanes with a maximum certificated take-off mass of more than 27 000 kg;
   c. any dedicated parameters relating to novel or unique design or operational characteristics of the aeroplane, as determined by the competent authority responsible for the type certification or supplemental type certification; and
   d. the additional parameters listed in Table 3 of AMC2 OPS.GEN.490.A, for those aeroplanes equipped with an electronic display system.

2. When determined by the competent authority responsible for type certification or supplemental type certification, the flight data recorder of aeroplanes first issued with an individual certificate of airworthiness before 20 August 2002 and equipped with an electronic display system does not need to record those parameters listed in Table 3 of AMC2 OPS.GEN.490.A for which:
   a. the sensor is not available;
   b. the aeroplane system or equipment generating the data needs to be modified; or

<table>
<tr><th>A: Rule</th><th>B: Summary of comments</th><th>C: Reason for change, remarks</th></tr>
<tr><td>c. the signals are incompatible with the recording system.</td><td></td><td></td></tr>
<tr><td>4. The operational performance requirements for FDRs should be those laid down in EUROCAE ED-55 Minimum Operational Performance Specification for Flight Data Recorder Systems.</td><td></td><td></td></tr>
<tr><td>5. The parameters to be recorded should meet, as far as is practicable, the performance specifications (designated ranges, sampling intervals, accuracy limits and minimum resolution in read-out) defined in the relevant tables of EUROCAE ED-55. The remarks columns of those tables are considered to be acceptable means of compliance with the parameter specifications.</td><td></td><td></td></tr>
<tr><td>6. For aeroplanes with novel or unique design or operational characteristics, the additional parameters should be those required by authority responsible for type certification or supplemental type certification.</td><td></td><td></td></tr>
<tr><td>7. If recording capacity is available, as many of the additional parameters specified in table A1.5 of EUROCAE ED-55 as is possible, should be recorded.</td><td></td><td></td></tr>
<tr><td>Table 1 of AMC2 OPS.GEN.490.A</td><td></td><td></td></tr>
<tr><td>Aeroplanes with a maximum certificated take-off mass exceeding 5 700 kg and first issued with an individual certificate of airworthiness after 1 January 2005</td><td></td><td></td></tr>
<tr><td>
<table>
<tr><th>No.*</th><th>Parameter</th></tr>
<tr><td>1</td><td>Time or relative time count</td></tr>
<tr><td>2</td><td>Pressure altitude</td></tr>
<tr><td>3</td><td>Indicated air speed</td></tr>
<tr><td>4</td><td>Heading</td></tr>
<tr><td>5</td><td>Normal acceleration</td></tr>
<tr><td>6</td><td>Pitch attitude</td></tr>
<tr><td>7</td><td>Roll attitude</td></tr>
<tr><td>8</td><td>Manual radio transmission keying</td></tr>
<tr><td>9</td><td>Propulsive thrust/power on each engine and cockpit thrust/power lever position if applicable</td></tr>
<tr><td>10</td><td>Trailing edge flap or cockpit control selection</td></tr>
</table>
</td><td></td><td></td></tr>
</table>

A: Rule	B: Summary of comments	C: Reason for change, remarks
11 Leading edge flap or cockpit control selection 12 Thrust reverse status 13 Ground spoiler position and/or speed brake selection 14 Total or outside air temperature 15 Autopilot, autothrottle and AFCS mode and engagement status 16 Longitudinal acceleration (body axis) 17 Lateral acceleration * The number in the left hand column reflects the serial numbers depicted in EUROCAE ED-55.		
Table 2 of AMC2 OPS.GEN.490.A		
Parameters for aeroplanes with a maximum certificated take-off mass exceeding 27 000 kg		
No.* Parameter 1 Time or relative time count 2 Pressure altitude 3 Indicated air speed 4 Heading 5 Normal acceleration 6 Pitch attitude 7 Roll attitude 8 Manual radio transmission keying 9 Propulsive thrust/power on each engine and cockpit thrust/power lever position if applicable 10 Trailing edge flap or cockpit control selection 11 Leading edge flap or cockpit control selection 12 Thrust reverse status		

A: Rule		B: Summary of comments	C: Reason for change, remarks
13	Ground spoiler position and/or speed brake selection		
14	Total or outside air temperature		
15	Autopilot, autothrottle and AFCS mode and engagement status		
16	Longitudinal acceleration (body axis)		
17	Lateral acceleration		
18	Primary flight controls - control surface position and/or pilot input (pitch, roll, yaw)		
19	Pitch trim position		
20	Radio altitude		
21	Vertical beam deviation (ILS glide path or MLS elevation)		
22	Horizontal beam deviation (ILS localiser or MLS azimuth)		
23	Marker beacon passage		
24	Warnings		
25	Reserved (navigation receiver frequency selection is recommended)		
26	Reserved (DME distance is recommended)		
27	Landing gear squat switch status or air/ground status		
28	GPWS		
29	Angle of attack		
30	Low pressure warning (hydraulic and pneumatic power)		
31	Ground speed		
32	Landing gear or gear selector position		
* The number in the left hand column reflects the serial numbers depicted in EUROCAE ED-55.			
Table 3 of AMC2 OPS.GEN.490.A			
additional parameters for Aeroplanes equipped with electronic display systems			

A: Rule	B: Summary of comments	C: Reason for change, remarks
No. Parameter 33 Selected barometric setting (each pilot's station) 34 Selected altitude 35 Selected speed 36 Selected mach 37 Selected vertical speed 38 Selected heading 39 Selected flight path 40 Selected decision height 41 EFIS display format 42 Multi-function/engine/alerts display format * The number in the centre column reflects the serial numbers depicted in table A1.5 of EUROCAE ED-55.		
AMC3 OPS.GEN.490.A Flight data recorder - Aeroplanes		
LIST OF PARAMETERS TO BE RECORDED FOR AEROPLANES FIRST ISSUED WITH AN INDIVIDUAL CERTIFICATE OF AIRWORTHINESS ON OR AFTER 1 JUNE 1990 UP TO AND INCLUDING 31 MARCH 1998		
1. The flight data recorder should, with reference to a timescale, record the parameters listed in Table 1 of AMC3 OPS.GEN.490.A.		
2. When determined by the competent authority responsible for type certification or supplemental type certification, the flight data recorder of aeroplanes having a maximum certificated take-off mass of 27 000 kg does not need to record parameters 14 and 15b of Table 1 of AMC3 OPS.GEN.490.A when any of the following conditions are met: a. The sensor is not readily available; b. Sufficient capacity is not available in the FDR system; c. A change is required in the equipment that generates the data.		
3. When determined by the competent authority responsible for type certification or supplemental type certification and agreed by the Agency, the flight data recorder does not need to record parameters 15b 23, 24, 25, 26, 27, 28, 29, 30 and 31 of		

<table>
<tr><th>A: Rule</th><th>B: Summary of comments</th><th>C: Reason for change, remarks</th></tr>
<tr><td>Table 1 of AMC3 OPS.GEN.490.A, when any of the following conditions are met:
a. The sensor is not readily available;
b. Sufficient capacity is not available in the FDR system;
c. A change is required in the equipment that generates the data;
d. For navigational data (NAV frequency selection, DME distance, latitude, longitude, ground speed and drift), the signals are not available in digital form;
e. When the above conditions have been met and compliance with this AMC would imply significant modifications to the aeroplane with a severe re-certification effort.</td><td></td><td></td></tr>
<tr><td>4. When determined by the competent authority responsible for type certification or supplemental type certification and agreed by the Agency, the flight data recorder does not need to record individual parameters that can be derived by calculation from the other recorded parameters.</td><td></td><td></td></tr>
<tr><td>Table 1 of AMC3 OPS.GEN.490.A
Aeroplanes with a maximum certificated take-off mass exceeding 27 000 kg
<table><tr><td>No.</td><td>Parameter</td></tr><tr><td>1</td><td>Time or relative time count</td></tr><tr><td>2</td><td>Pressure altitude</td></tr><tr><td>3</td><td>Indicated air speed</td></tr><tr><td>4</td><td>Heading</td></tr><tr><td>5</td><td>Normal acceleration</td></tr><tr><td>6</td><td>Pitch attitude</td></tr><tr><td>7</td><td>Roll attitude</td></tr><tr><td>8</td><td>Manual radio transmission keying unless an alternate means to synchronise FDR and CVR recordings is provided</td></tr><tr><td>9</td><td>Power on each engine</td></tr><tr><td>10</td><td>Trailing edge flap or cockpit control selection</td></tr><tr><td>11</td><td>Leading edge flap or cockpit control selection</td></tr><tr><td>12</td><td>Thrust reverse position (for turbo-jet aeroplanes only)</td></tr></table></td><td></td><td></td></tr>
</table>

A: Rule		B: Summary of comments	C: Reason for change, remarks
13	Ground spoiler position and/or speed brake selection		
14	Outside air temperature or total air temperature		
15a 15b	Autopilot engagement status Autopilot operating modes, autothrottle and AFCS systems engagement status and operating modes.		
16	Longitudinal acceleration		
17	Lateral acceleration		
18	Primary flight controls - control surface position and/or pilot input (pitch, roll and yaw)		
19	Pitch trim position		
20	Radio altitude		
21	Glide path deviation		
22	Localiser deviation		
23	Marker beacon passage		
24	Master warning		
25	NAV 1 and NAV 2 frequency selection		
26	DME 1 and DME 2 distance		
27	Landing gear squat switch status		
28	Ground proximity warning system		
29	Angle of attack		
30	Hydraulics, each system (low pressure)		
31	Navigation data		
32	Landing gear or gear selector position		
AMC4 OPS.GEN.490.A Flight data recorder - Aeroplanes			
LIST OF PARAMETERS TO BE RECORDED FOR AEROPLANES FIRST ISSUED WITH AN INDIVIDUAL CERTIFICATE OF AIRWORTHINESS BEFORE 1 JUNE 1990			

A: Rule	B: Summary of comments	C: Reason for change, remarks
1. The flight data recorder should, with reference to a timescale, record the parameters listed in Table 1 of AMC4 OPS.GEN.490.A.		
2. When determined by the competent authority responsible for type certification or supplemental type certification and agreed by the Agency, the FDR of aeroplanes with a maximum certificated take-off mass exceeding 27 000 kg that are of a type which was first type certificated after 30 September 1969 does not need to record the parameters 13, 14 and 15b in Table 1 of AMC4 OPS.GEN.490.A, when any of the following conditions are met: a. Sufficient capacity is available on a FDR system; b. The sensor is readily available; c. A change is not required in the equipment that generates the data.		
3. When so determined by the competent authority responsible for type certification or supplemental type certification and agreed by the Agency, the FDR does not need to record individual parameters that can be derived by calculation from the other recorded parameters.		
Table 1 of AMC4 OPS.GEN.490.A Aeroplanes with a maximum certificated take-off mass exceeding 27 000 Kg		

No.	Parameter
1	Time or relative time count
2	Pressure altitude
3	Indicated air speed
4	Heading
5	Normal acceleration
6	Pitch attitude
7	Roll attitude
8	Manual radio transmission keying unless an alternate means to synchronise the FDR and CVR recordings is provided
9	Power on each engine
10	Trailing edge flap or cockpit control selection
11	Leading edge flap or cockpit control selection

A: Rule		B: Summary of comments	C: Reason for change, remarks
12	Thrust reverse position (for turbo-jet aeroplanes only)		
13	Ground spoiler position and/or speed brake selection		
14	Outside air temperature or total air temperature		
15a 15b	Autopilot engagement status Autopilot operating modes, autothrottle and AFCS, systems engagement status and operating modes.		
16	Longitudinal acceleration		
17	Lateral acceleration		
18	Primary flight controls - control surface position and/or pilot input (pitch, roll and yaw)		
19	Pitch trim position		
20	Radio altitude		
21	Glide path deviation		
22	Localiser deviation		
23	Marker beacon passage		
24	Master warning		
25	NAV 1 and NAV 2 frequency selection		
26	DME 1 and DME 2 distance		
27	Landing gear squat switch status		
28	Ground proximity warning system		
29	Angle of attack		
30	Hydraulics, each system (low pressure)		
31	Navigation data (latitude, longitude, ground speed and drift angle)		
32	Landing gear or gear selector position		

A: Rule	B: Summary of comments	C: Reason for change, remarks
Appendix 1 to AMC3 and AMC4 OPS.GEN.490.A Flight data recorder - Aeroplanes		
PERFORMANCES SPECIFICATIONS FOR THE PARAMETERS TO BE RECORDED FOR AEROPLANES FIRST ISSUED WITH AN INDIVIDUAL CERTIFICATE OF AIRWORTHINESS BEFORE 1 APRIL 1998		
1. The parameters to be recorded should meet the performance specifications (designated ranges, recording intervals and accuracy limits) defined in Table 1 of Appendix 1 to AMC3 and AMC4 OPS.GEN.490.A.		
2. FDR systems for which the recorded parameters do not comply with the performance specifications of Table 1 of Appendix 1 to AMC3 and AMC4 OPS.GEN.490.A (i.e. range, sampling intervals, accuracy limits and recommended resolution readout) may be acceptable to the competent authority responsible for the type certification or supplemental type certification.		
3. All aeroplanes should record the following additional parameters, when further recording capacity is available:		
a. Remaining parameters below, as applicable:		
i. Operational information from electronic display systems, such as EFIS, Electronic Centralised Aircraft Monitor (ECAM) and Engine Indications and Crew Alerting System (EICAS). The following order of priority should be used:		
A. Parameters selected by the flight crew relating to the desired flight path, e.g. barometric pressure setting, selected altitude, selected air speed, decision height, autoflight system engagement and mode indications if not recorded from another source;		
B. Display system selection/status, e.g. SECTOR, PLAN, ROSE, NAV, WXR, COMPOSITE, COPY;		
C. Warnings and alerts;		
D. The identity of displayed pages for emergency procedures and checklists.		
ii. Retardation information including brake application for use in the investigation of landing over-runs and rejected take-offs;		
iii. Additional engine parameters (EPR, N_1 EGT, fuel flow, etc.);		
b. Any dedicated parameter relating to novel or unique design or operational characteristics of the aeroplane.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
4. For the purpose of the alleviations specified in AMC3 OPS.GEN.490.A and AMC4 OPS.GEN.490.A, they should be acceptable only when adding recording of missing parameters to the existing FDR system would require a major upgrade of the system itself. Account should be taken of the following: a. The extent of the modification required; b. The down-time period; c. Equipment software development.		
5. The term "capacity available" refers to the space on both the flight data acquisition unit and the flight data recorder not allocated for recording the required parameters, or the parameters recorded for the purpose of accident investigation, as acceptable to the competent authority.		
6. A sensor is considered "readily available" when it is already available or can be easily incorporated.		
Table 1 of Appendix 1 to AMC3 and AMC4 OPS.GEN.490.A Parameters Performance Specifications		

No.	Parameter	Range	Sampling interval in seconds	Accuracy limits (sensor input compared to FDR readout)	Recommended resolution in readout	Remarks
1	Time or relative time count	24 hours	4	±0•125 % per hour	1 second	Co-ordinated Universal Time (UTC) preferred where available, otherwise elapsed time
2	Pressure altitude	-1 000 ft to maximum certificated altitude of aircraft +5 000 ft	1	±100 ft to ±700 ft	5 ft	For altitude record error see EASA ETSO-C124a

A: Rule							B: Summary of comments	C: Reason for change, remarks
3	Indicated air speed	50 kt to max VSO Max VSO to 1•2 Vd	1	±5% ±3%	1 kt	VSO stalling speed or minimum steady flight speed in the landing configuration VdF design diving speed		
4	Heading	360º	1	±2º	0•5º			
5	Normal acceleration	-3 g to +6 g	0•125 ±	0•125 ±1% of maximum range excluding a datum error of ±5%	0•004 g			
6	Pitch attitude	±75º	1	±2º	0•5º			
7	Roll attitude	±180º	1	±2º	0•5º			
8	Manual radio transmission keying	Discrete	1	-	-	On-off (one discrete). An FDR/CVR time synchronisation signal complying with 4.2.1 of EUROCAE ED-55 is considered to be an acceptable alternative means of compliance		
9	Power on each engine	Full range	Each engine each second	±2%	0•2% of full range	Sufficient parameters e.g. EPR/N, or Torque/N_P as appropriate to the particular engine should be recorded to determine		

A: Rule							B: Summary of comments	C: Reason for change, remarks
						power		
10	Trailing edge flap or cockpit control selection	Full range or each discrete position	2	±5% or as pilot's indicator	0•5% of full range			
11	Leading edge flap or cockpit control selection	Full range or each discrete position	2	-	0•5% of full range			
12	Thrust reverser position	Stowed, in transit and reverse	Each reverser each second	±2% unless higher accuracy uniquely required	-			
13	Ground spoiler and/or speed brake selection	Full range or each discrete position	1	±2º	0•2% of full range			
14	Outside air temperatures or total air temperature	Sensor range	2	-	0•3º			
15a 15 b	Autopilot engagement status Autopilot operating modes, autothrottle and AFCS systems engagement status and operating	A suitable combination of discretes	1		-			

A: Rule							B: Summary of comments	C: Reason for change, remarks
	modes							
16	Longitudinal acceleration	± 1 g	0•25	±1•5% of maximum range excluding a datum error of ±5%	0•004 g			
17	Lateral acceleration	±1 g	0•25	±1•5% of maximum range excluding a datum error of ±5%	0•004 g			
18	Primary flight controls, control surface positions and/or pilot input (pitch, roll, yaw)	Full range	1	±2º unless higher accuracy uniquely required	0•2% of full range	For aeroplanes with conventional control systems 'or' applies For aeroplanes with non-mechanical control systems 'and' applies For aeroplanes with split surfaces a suitable combination of inputs is acceptable in lieu of recording each surface separately		
19	Pitch trim position	Full range	1	±3% unless higher accuracy uniquely required	0•3% of full range			

A: Rule							B: Summary of comments	C: Reason for change, remarks
20	Radio altitude	-20 ft to +2 500 ft	1	±2 ft or ±3% whichever is greater below 500 ft and ±5% above 500 ft	1 ft below 500 ft, 1 ft +5% of full range above 500 ft	As installed. Accuracy limits are recommended		
21	Glide path deviation	Signal range	1	±3%	0•3% of full range	As installed. Accuracy limits are recommended		
22	Localiser deviation	Signal range	1	±3%	0•3% of full range	As installed. Accuracy limits are recommended		
23	Marker beacon passage	Discrete	1	–	–	A single discrete is acceptable for all markers		
24	Master warning	Discrete	1	–	–			
25	NAV 1 and 2 frequency selection	Full range	4	As installed	–			
26	DME 1 and 2 distance	0-200 nm	4	As installed	–	Recording of latitude and longitude from INS or other navigation system is a preferred alternative		
27	Landing gear squat switch status	Discrete	1	–	–			
28	Ground proximity warning system (GPWS)	Discrete	1	–	–			

A: Rule	B: Summary of comments	C: Reason for change, remarks

29	Angle of attack	Full range	0•5	As installed	0•3% of full range	
30	Hydraulics	Discrete(s)	2	–	–	
31	Navigation data	As installed	1	As installed	–	
32	Landing gear or gear selector position	Discrete	4	As installed	–	

AMC1 OPS.GEN.490.H Flight data recorder - Helicopters

LIST OF PARAMETERS TO BE RECORDED FOR HELICOPTERS FIRST ISSUED WITH AN INDIVIDUAL CERTIFICATE OF AIRWORTHINESS ON OR AFTER 1 JANUARY 2010

1. The FDR should, with reference to a timescale, record:
   a. the parameters listed in Table 1 of AMC1 OPS.GEN.490.H;
   b. the additional parameters listed in Table 2 of AMC1 OPS.GEN.490.H, 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
   c. any dedicated parameters related to novel or unique design or operational characteristics of the helicopter as determined by the competent authority responsible for type certification or supplemental type certification.

2. The FDR should meet the operational performance requirements and specifications of EUROCAE ED-112 and Attachment B of ICAO Annex 6, Part III .

3. FDR systems for which the recorded parameters do not meet the performance specifications of EUROCAE ED-112 (i.e. range, sampling intervals, accuracy limits and recommended resolution readout) could be acceptable to the competent authority responsible for type certification or supplemental type certification.

Table 1 of AMC1 OPS.GEN.490.H

No.*	Parameter
1	Time or relative time count
2	Pressure altitude

A: Rule		B: Summary of comments	C: Reason for change, remarks
3	Indicated air speed		
4	Heading		
5	Normal acceleration		
6	Pitch attitude		
7	Roll attitude		
8	Manual radio transmission keying CVR/FDR synchronisation reference		
9 9a 9b 9c 9d 9e	Power on each engine Free power turbine speed (N_F) Engine torque Engine gas generator speed (N_G) Cockpit power control position Other parameters to enable engine power to be determined		
10a 10b	Main rotor speed Rotor brake (if installed)		
11 11a 11b 11c 11d 11e 11f	Primary flight controls – Pilot input and/or control output position (if applicable) Collective pitch Longitudinal cyclic pitch Lateral cyclic pitch Tail rotor pedal Controllable stabilator (if applicable) 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)		

A: Rule	B: Summary of comments	C: Reason for change, remarks
<table><tr><td>21</td><td>Lateral acceleration</td></tr><tr><td>25</td><td>Marker beacon passage</td></tr><tr><td>26</td><td>Warnings - 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.</td></tr><tr><td>27</td><td>Each navigation receiver frequency selection</td></tr><tr><td>37</td><td>Engine control modes</td></tr></table> * The number in the left hand column reflects the serial numbers depicted in EUROCAE ED-112		
Table 2 of AMC1 OPS.GEN.490.H Helicopters for which the information 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		1. Editorial justification: a title was added to this table. Note: this table contains the parameters not marked with an asterisk in table A of appendix 1 to JAR-OPS 3.712.
<table><tr><td>No.*</td><td>Parameter</td></tr><tr><td>14</td><td>AFCS mode and engagement status</td></tr><tr><td>15</td><td>Stability augmentation system engagement (each system should be recorded)</td></tr><tr><td>16</td><td>Main gear box oil pressure</td></tr><tr><td>17 17a 17b 17c</td><td>Gear box oil temperature Main gear box oil temperature Intermediate gear box oil temperature Tail rotor gear box oil temperature</td></tr><tr><td>19</td><td>Indicated sling load force (if signals readily available)</td></tr><tr><td>22</td><td>Radio altitude</td></tr><tr><td>23 23a 23b</td><td>Vertical deviation - the approach aid in use should be recorded. ILS glide path MLS elevation</td></tr></table>		

A: Rule		B: Summary of comments	C: Reason for change, remarks
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		
36	Helicopter Health and Usage Monitor System (HUMS) - only when information from the HUMS is used by the crew or aircraft system		
36a	Engine data		
36b	Chip detector		
36c	Track timing		
36d	Exceedance discretes		
36e	Broadband average engine vibration		

A: Rule		B: Summary of comments	C: Reason for change, remarks
38	Selected barometric setting - to be recorded for helicopters where the parameter is displayed electronically		
38a	Pilot		
38b	First officer		
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	Not used (selected mach)		
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 ED-112			
AMC2 OPS.GEN.490.H Flight data recorder - Helicopters			
LIST OF PARAMETERS TO BE RECORDED FOR HELICOPTERS HAVING A MCTOM EXCEEDING 3 175 KG AND FIRST ISSUED WITH AN INDIVIDUAL CERTIFICATE OF AIRWORTHINESS AFTER 1 JANUARY 2005 AND HELICOPTERS HAVING A MCTOM EXCEEDING 7 000 KG AND FIRST ISSUED WITH AN INDIVIDUAL CERTIFICATE OF AIRWORTHINESS AFTER 31 DECEMBER 1988			
1. The FDR should, with reference to a timescale, record: a. for helicopters with a maximum certificated take-off mass between 3 175 kg and 7 000 kg, the parameters listed in Table 1 of AMC2 OPS.GEN.490.H; b. for helicopters with a maximum certificated take-off mass of more than 7			

A: Rule	B: Summary of comments	C: Reason for change, remarks
000 kg, the parameters listed in Table 2 of AMC2 OPS.GEN.490.H; c. any dedicated parameters relating to novel or unique design or operational characteristics of the helicopter; and d. the parameters listed in Table 3 of AMC2 OPS.GEN.490.H, for helicopters equipped with electronic display system.		
2. When determined by the competent authority responsible for type certification or supplemental type certification and agreed by the Agency, the FDR of helicopters with a maximum certificated take-off mass of more than 7 000 kg does not need to record parameter 19 of Table 2 of AMC2 OPS.GEN.490.H, if any of the following conditions are met: a. The sensor is not available; b. A change is required in the equipment that generates the data.		
3. Individual parameters that can be derived by calculation from the other recorded parameters, need not be recorded, if determined by the competent authority responsible for type certification or supplemental type certification and agreed by the Agency.		
4. The parameters to be recorded should meet, as far as is practicable, the performance specifications (designated ranges, sampling intervals, accuracy limits and minimum resolution in read-out) defined in the relevant tables of EUROCAE ED-55. The remarks columns of those tables are considered to be acceptable means of compliance with the parameter specifications.	1. (MS: 1; INDUS: 0; INDIV: 0) ED-55 is obsolete and has been superseded by ED-112.	1. Regulatory justification: EUROCAE Document ED-55 is an obsolete document, which is not published nor maintained anymore by EUROCAE and therefore it should not be referenced anymore. The parameter performance specification table of ED-55 have been imported in a new AMC CAT.IDE.H.190.
5. Table 1 of AMC2 OPS.GEN.490.H refers to table A1-4 of EUROCAE ED-55, Table 2 of AMC2 OPS.GEN.490.H refers to table A1-2 of EUROCAE ED-55 and Table 3 of AMC2 OPS.GEN.490.H refers to parameters 6 to 15 of table A1.5 of EUROCAE ED-55.	1. (MS: 1; INDUS: 0; INDIV: 0) ED-55 is obsolete and has been superseded by ED-112.	1. Regulatory justification: EUROCAE Document ED-55 is an obsolete document, which is not published nor maintained anymore by EUROCAE and therefore it should not be referenced anymore. The parameter performance specification table of ED-55 have been imported in a new in a new AMC CAT.IDE.H.190.
6. If recording capacity is available, as many of the additional parameters specified in table A1.5 of EUROCAE ED-55 as is possible, should be recorded.	1. (MS: 1; INDUS: 0; INDIV: 0) ED-55 is obsolete and has been superseded by ED-112.	1. Regulatory justification: EUROCAE Document ED-55 is an obsolete document, which is not published nor maintained anymore by EU-

<table>
<tr><th>A: Rule</th><th>B: Summary of comments</th><th>C: Reason for change, remarks</th></tr>
<tr><td></td><td></td><td>ROCAE and therefore it should not be referenced anymore.

To the extent it does not drive costly retrofits for old-generation aircraft.</td></tr>
<tr><td>7. For the purpose of this AMC, a sensor is considered to be ‘readily available’ when it is already available or can be easily incorporated.</td><td></td><td></td></tr>
<tr><td>8. The term ‘where practicable’ used in the remarks column of table A1.5 of EUROCAE ED-55 means that account should be taken of the following:
a. Whether the sensor is already available or can be easily incorporated;
b. Whether sufficient capacity is available in the flight recorder system;
c. For navigational data (nav frequency selection, DME distance, latitude, longitude, groundspeed and drift), whether the signals are available in digital form;
d. The extent of modification required;
e. The down-time period required;
f. Equipment software development.</td><td>1. (MS: 1; INDUS: 0; INDIV: 0)

ED-55 is obsolete and has been superseded by ED-112.</td><td>1.

Regulatory justification:

EUROCAE Document ED-55 is an obsolete document, which is not published nor maintained anymore by EUROCAE and therefore it should not be referenced anymore.

The parameter performance specification table of ED-55 have been imported in a new in a new AMC CAT.IDE.H.190.</td></tr>
<tr><td>Table 1 of AMC2 OPS.GEN.490.H

Helicopters with a maximum certificated take-off mass exceeding 3 175 kg

<table><tr><th>No.</th><th>Parameter</th></tr><tr><td>1</td><td>Time or relative time count</td></tr><tr><td>2</td><td>Pressure altitude</td></tr><tr><td>3</td><td>Indicated air speed</td></tr><tr><td>4</td><td>Heading</td></tr><tr><td>5</td><td>Normal acceleration</td></tr><tr><td>6</td><td>Pitch attitude</td></tr><tr><td>7</td><td>Roll attitude</td></tr><tr><td>8</td><td>Manual radio transmission keying</td></tr><tr><td>9</td><td>Power on each engine (free power turbine speed and engine torque)/cockpit power control position (if applicable)</td></tr><tr><td>10a</td><td>Main rotor speed</td></tr></table></td><td></td><td></td></tr>
</table>

A: Rule	B: Summary of comments	C: Reason for change, remarks
10b Rotor brake (if installed)		
11 Primary flight controls - pilot input and control output position (if applicable) 11a Collective pitch 11b Longitudinal cyclic pitch 11c Lateral cyclic pitch 11d Tail rotor pedal 11e Controllable stabilator 11f Hydraulic selection 12 Warnings 13 Outside air temperature 14 Autopilot engagement status 15 Stability augmentation system engagement		
Table 2 of AMC2 OPS.GEN.490.H Helicopters with a maximum certificated take-off mass exceeding 7 000 kg		
No. Parameter 1 Time or relative time count 2 Pressure altitude 3 Indicated 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 Main rotor speed		

A: Rule		B: Summary of comments	C: Reason for change, remarks
10b	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		
27	Reserved (Nav receiver frequency selection is recommended)		
28	Reserved (DME distance is recommended)		

A: Rule	B: Summary of comments	C: Reason for change, remarks
29 Reserved (navigation data is recommended) 30 Landing gear or gear selector position		
Table 3 of AMC2 OPS.GEN.490.H		
Helicopters equipped with electronic display systems		
No. Parameter 6 Selected barometric setting (each pilot station) 7 Selected altitude 8 Selected speed 9 Selected mach 10 Selected vertical speed 11 Selected heading 12 Selected flight path 13 Selected decision height 14 EFIS display format 15 Multi function/engine/alerts display format		
AMC OPS.GEN.495.A Cockpit voice recorder - Aeroplanes		
GENERAL		
1. The CVR should, with reference to a timescale, record: a. flight crew members' two-way voice communications by radio, interphone system and public address system, if installed; b. the aural environment of the cockpit, including, where practicable, without interruption, the microphone audio signals; and c. voice or audio signals identifying navigation or approach aids introduced into a headset or speaker.	1. (MS: 1; INDUS: 0; INDIV: 0) Do not agree with moving parts of requirements on the nature of the recording into the AMC – material.	1.Safety justification: For commercial air transport the content of the CVR recording should be better standardised, all the more that it is described in EU-OPS 1.700 to 1.710 and JAR-OPS 3.700 to 3.710. The nature of the information to be recorded must be explicitly defined, so that relevant information will be available for safety investigators after an accident or an incident.
2. The operational performance requirements for CVRs should be those laid down in EUROCAE Documents ED56 or ED56A (Minimum Operational Performance Requirements For Cockpit Voice Recorder Systems) dated February 1988 and		1.Since EUROCAE Document ED-112 supersedes ED-56A (see the foreword in ED-112) and ED-56A is not maintained nor published anymore by EUROCAE, all

A: Rule	B: Summary of comments	C: Reason for change, remarks
December 1993 respectively.		references to ED-56A that were in TGL44 are removed.
AMC OPS.GEN.495.H Cockpit voice recorder - Helicopters	1. (MS:2;INDUS: 0; INDIV: 0) (H) The requirements for the specific parameters to be recorded which were in JAR-OPS 3 must not be 'downgraded' to what is effectively only a recommendation as the NPA only addresses them in the AMC section. If these are not required as part of the rule it is likely that any standardisation currently in place in Europe will be lost. The tables need moving back to the rule. For CAT: apply dates and weights from EU-OPS / JAR-OPS 3.	1. (H) Safety justification The nature of the data to record should at least be described succinctly, since some information is essential for safety investigations. However the exhaustive list of parameters and the recording quality requirements (range, accuracy, resolution, sampling rate) can stay in the AMC. New requirements for an FDR were proposed in NPA-OPS 67, for helicopters with an ICA delivered on or after 1 January 2010. These new requirements were introduced in NPA 2009-2b, OPS.GEN.490 (c). They are now transposed into a specific requirement for helicopters with an ICA delivered after 2016.
GENERAL		
1. The CVR should, with reference to a timescale, record: a. flight crew members' two-way voice communications via radio, interphone system and public address system; b. the aural environment of the cockpit, including, where practicable, without interruption, the microphone audio signals; c. voice or audio signals identifying navigation or approach aids introduced into a headset or speaker; and d. for helicopters not equipped with a flight data recorder, the parameters necessary to determine main rotor speed.	1. (MS: 1; INDUS: 0; INDIV: 0) Do not agree with moving parts of requirements on the nature of the recording into the AMC material.	1. Safety justification: For commercial air transport the content of the CVR recording should stay standardized, all the more that it is a "shall" in JAR-OPS 3.700 and 3.705 The nature of the information to be recorded must be explicitly defined, so that relevant information will be available for safety investigators after an accident or an incident.
2. The operational performance requirements of EUROCAE ED-56/56A should be considered to be acceptable means of compliance.		1. Since EUROCAE Document ED-112 supersedes ED-56A (see the foreword in ED-112) and ED-56A is not maintained nor published anymore by EUROCAE, all references to ED-56A that JAR-OPS 3 are removed.

A: Rule	B: Summary of comments	C: Reason for change, remarks
AMC OPS.GEN.495(c) Cockpit voice recorder		1. Moved at rule level.
RECORDING		
Depending on the availability of electrical power, the CVR should start to record as early as possible during the cockpit checks, prior to the flight until the cockpit checks immediately following engine shutdown at the end of the flight.		
AMC OPS.GEN.490 and OPS.GEN.495 Flight data recorder and cockpit voice recorder	1. (MS: 1; INDUS: 0; INDIV: 0) (H) This NPA addresses the possibility of using combined recorders in the AMCs, whereas it was addressed in section 1 of JAR-OPS 3.	1. (H) Regulatory justification There is no paragraph dedicated to combination recorders in JAR-OPS 3 section 1, but mention to combination recorders is spread over JAR-OPS 3.700 (e), JAR-OPS 3.705 (e), JAR-OPS 3.715 (g), JAR-OPS 3.720 (h). The definition of the combination recorder is defined in JAR-OPS 3, section 2, ACJ OPS 3.700(e), therefore it should also appear in an AMC.
COMBINATION RECORDERS		
1. A combination recorder is a flight recorder that records: a. all voice communications and the aural environment required by the applicable CVR AMC; and b. all parameters and specifications required by the applicable FDR AMC.	1. (MS: 1; INDUS: 0; INDIV: 0) This NPA addresses the possibility of using combined recorders in the AMCs, whereas it was addressed in JAR-OPS 1 Section 1 and in EU-OPS.	1.Safety justification: Considering the advent of data link recording, the future OPS Regulation should also regulate the use and preservation of data link recordings in the same manner as was done for CVR and FDR recordings in EU-OPS.
2. When two combination recorders are installed, one should be located near the cockpit, in order to minimise the risk of data loss due to a failure of the wiring that gathers data to the recorder. The other should be located at the rear section of the aeroplane, in order to minimise the risk of data loss due to recorder damage in the case of a crash.		1.Regulatory justification: This paragraph was to be found in TGL 44, ACJ OPS 1.727 (and not in JAR-OPS 3). Logically, it should remain in an AMC, and should only be applicable to aeroplanes.
3. For aeroplanes, compliance with CVR and FDR requirements may be achieved by: a. one combination recorder, if the aeroplane should be equipped with either a CVR or an FDR; b. one combination recorder, if an aeroplane with a maximum certificated take-off mass of 5 700 kg or less should be equipped with both a CVR and an FDR; or c. two combination recorders, if an aeroplane with a maximum certificated	1. (MS: 1; INDUS: 0; INDIV: 0) This NPA addresses the possibility of using combined recorders in the AMCs, whereas it was addressed in JAR-OPS 1 Section 1 and in EU-OPS.	1. Regulatory justification EU-OPS 1.727 is also dedicated to the use of combination recorders. It contains hard requirements (“shall”) on the number of combined recorders to have installed to be compliant.

A: Rule	B: Summary of comments	C: Reason for change, remarks
take-off mass of more than 5 700 kg should be equipped with both a CVR and an FDR.		
AMC1 OPS.GEN.500 Data link recording - Aeroplanes and Helicopters		
GENERAL		
1. Depending on the date of type certification, the aircraft shall be capable of recording the messages as specified in AMC2 OPS.GEN.500.		
2. As a means of compliance with OPS.GEN.500 (a)(2), the operator should enable correlation by providing information which allows an accident investigator to understand what data was provided to the aircraft and by which provider.	1. (MS: 0; INDUS: 1; INDIV: 0) The requirement related to the last part of this section (…and by which provider) couldn't be complied with. The term "provider" is not specified concerning the expected information. Identifications of the ATS provider are not part of the recorded information, unless it is part of the message.	1.Regulatory justification If the message received contains no information on the identity of the provider, this information has to be derived by other means, which is over-demanding.
3. The timing information associated with the data link communications messages required to be recorded by OPS.GEN.500 (a)(3) should be capable of being determined from the airborne-based recordings. This timing information should include at least the following: a. The time each message was generated; b. The time any message was available to be displayed by the crew; c. The time each message was actually displayed or recalled from a queue; d. The time of each status change.		
4. The message priority should be recorded when it is defined by the protocol of the data link communication message being recorded.		
5. The expression 'taking into account the system architecture', in OPS.GEN.500 (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: a. The extent of the modification required; b. The down-time period; c. Equipment software development.		
6. The intention is that new designs of source systems should include this functionality and support the full recording of the required information.		
7. The applications to be recorded should meet the performance specifications defined in the relevant tables of part IV CNS/ATM recorder systems of EUROCAE	1. (MS: 0; INDUS: 1; INDIV: 0) The tables in part IV of ED-112 are immature and	1. Regulatory justification Only Table IV-B.1 of ED-112 contains recording speci-

A: Rule	B: Summary of comments	C: Reason for change, remarks
ED-112.	contain inconsistencies; another reference should be given. FAA established an AC 20-160 to define the approved data set that has to be recorded. Accepting these requirements as an alternative means of compliance would provide one standard. This also would improve the envisaged approach for harmonization of rules between Europe and USA.	fications, but they are redisplaying the content of ED-93 in a condensed and non-exhaustive way. In addition recording performance requirements would better fit in AMC2 OPS.GEN.500. FAA AC 20-160 does not only cover the applications to record, hence it cannot fit here. However FAA AC 20-160 already points at relevant parts of EUROCAE Document ED-93. ED-93 is the most exhaustive guidance document available on this subject. It is proposed here to strike out this paragraph and add a reference to ED-93 in AMC2 OPS.GEN.500.
8. Depending on the availability of electrical power, the flight recorder should 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.		1. This provision is to be found in NPA-OPS 48A, proposed JAR-OPS 1.728. It is consistent with the requirement on audio (CVR) recording to start during the cockpit checks prior to engine start and last until the cockpit checks immediately following engine shutdown.
AMC2 OPS.GEN.500 Data link recording - Aeroplanes and Helicopters		
LIST OF APPLICATIONS		
1. For aeroplanes and helicopters first issued with a type certificate after 31 December 2009, data link communications messages that support the applications in Table 1 of AMC2 OPS.GEN.500 should be recorded.	1. (MS: 0; INDUS: 1; INDIV: 0) Remove the dependency on the date of delivery of the ICA and replace sentences/tables 1 and 2 by a single table 1 covering all new manufactured aircraft.	1. Regulatory justification: The rule will apply to aircraft from 8th April 2014; therefore there is no need for making a distinction based on the date of delivery of the ICA. This AMC can be simplified to keep only the provisions related to after the mandatory date for data-link communication recording: remove table 1 and keep only table 2.
Table 1 of AMC2 OPS.GEN.500		
Item No. | Application Type | Application Description | Required Recording Content		

A: Rule				B: Summary of comments	C: Reason for change, remarks
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 controllers on the ground. In FANS-1/A and ATN, this includes the Controller Pilot Data Link Communications (CPDLC) application. It also includes applications used for the exchange of Oceanic Clearances (OCL) and Departure Clearances (DCL), as well as data link delivery of taxi clearances.	C		
3	Addressed surveillance (2)	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, Controller Access Parameters (CAP) and System Access Parameters (SAP).	C		1. Editorial justification: Consistency with GM CAT.IDE.A.195, paragraph 1.
4	Flight information	This includes any application used for delivery of flight information data to specific aeroplanes. This includes Data Link-Automatic Terminal Information Service (D-ATIS), Data Link-Operational Terminal Information Service (D-OTIS), text weather services, Data Link-Flight Information System (D-FIS) and Notice to Airmen (NOTAM) delivery.	C		
		Terminal Weather Information for Pilots (TWIP)	M		
5	Broadcast surveillance (2)	This includes elementary and enhanced surveillance systems, as well as Automatic Dependent Surveillance-Broadcast (ADS-B), Terminal Information Service-Broadcast (TIS-B) and Flight Information System-	M		1. Editorial justification: Consistency with GM CAT.IDE.A.195, paragraph 1.

<table>
<tr><th>A: Rule</th><th>B: Summary of comments</th><th>C: Reason for change, remarks</th></tr>
<tr><td>
<table>
<tr><td></td><td></td><td>Broadcast (FIS-B).</td><td></td></tr>
<tr><td>6</td><td>AOC data</td><td>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</td><td>M*</td></tr>
<tr><td>7</td><td>Graphics (1)</td><td>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).</td><td>M*</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td>2. For aeroplanes and helicopters first issued with a type certificate before 1 January 2010, data link communications messages that support the applications in Table 2 of AMC2 OPS.GEN.500 should be recorded:</td><td>1. (MS: 0; INDUS: 1; INDIV: 0)

Remove the dependency on the date of delivery of the ICA and replace sentences/tables 1 and 2 by a single table 1 covering all new manufactured aircraft.</td><td>1. Regulatory justification:

CAT.IDE.A.275 will apply to aeroplanes with an ICA delivered as from 8th April 2014.

This AMC can be simplified to keep only the provisions related to after the mandatory date for data link communication recording:

remove table 1 and keep only table 2.</td></tr>
<tr><td>Table 2 of AMC2 OPS.GEN.500</td><td></td><td></td></tr>
<tr><td>
<table>
<tr><td>Item No.</td><td>Application Type</td><td>Application Description</td><td>Required Recording Content</td></tr>
<tr><td>1</td><td>Data link initiation</td><td>This includes any application used to log on to, or initiate, a data link service. In FANS-1/A and ATN, these are AFN and CM, respectively</td><td>C</td></tr>
<tr><td>2</td><td>Controller/pilot communication</td><td>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 OCL and DCL, as well as data link delivery of taxi clearances.</td><td>C</td></tr>
<tr><td>3</td><td>Addressed surveillance (2)</td><td>This includes any surveillance application in which the ground sets up contracts for delivery of surveillance data.</td><td>C</td></tr>
</table>
</td><td></td><td></td></tr>
</table>

A: Rule				B: Summary of comments	C: Reason for change, remarks
		In FANS-1/A and ATN, this includes the ADS-C application.			
		CAP	C*		
		SAP	C*		
4	Flight information	This includes any application used for delivery of flight information data to specific aeroplanes. This includes D-ATIS, D-OTIS, text weather services, D-FIS and NOTAM delivery.	C		
		TWIP	M		
5	Broadcast surveillance (2)	This includes elementary and enhanced surveillance systems, as well as ADS-B, TIS-B and FIS-B.	M*		
6	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 (1)	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*		
GM OPS.GEN.500 Data link recording - Aeroplanes and Helicopters GENERAL					
1. The letters and expressions in Tables 1 and 2 of AMC2 OPS.GEN.500 have the following meaning: a. C: Complete contents recorded b. M: Information that enables correlation with any associated records stored separately from the aeroplane. c. *: Applications that are to be recorded only as far as is practicable, given the architecture of the system. d. F1: Graphics applications may be considered as AOC messages 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. e. F2: Where parametric data sent by the aeroplane, such as Mode S, is reported within the message, it should be recorded unless data from the same					

<table>
<tr><th>A: Rule</th><th>B: Summary of comments</th><th>C: Reason for change, remarks</th></tr>
<tr><td>source is recorded on the FDR.</td><td></td><td></td></tr>
<tr><td>2. The definitions of the applications type in Tables 1 and 2 of AMC2 OPS.GEN.500 are described in Table 1 of GM OPS.GEN.500.</td><td></td><td></td></tr>
<tr><td>Table 1 of GM OPS.GEN.500
<table>
<tr><th>Item No.</th><th>Application Type</th><th>Messages</th><th>Comments</th></tr>
<tr><td>1</td><td>CM</td><td></td><td>CM is an ATN service</td></tr>
<tr><td>2</td><td>AFN</td><td></td><td>AFN is a FANS 1/A service</td></tr>
<tr><td>3</td><td>CPDLC</td><td></td><td>All implemented up and downlink messages to be recorded</td></tr>
<tr><td rowspan="2">4</td><td rowspan="2">ADS-C</td><td>FLIPCY</td><td>All contract requests and reports recorded</td></tr>
<tr><td>Position reports</td><td>Only used within FANS 1/A. Mainly used in oceanic and remote areas.</td></tr>
<tr><td>5</td><td>ADS-B</td><td>Surveillance data</td><td>Information that enables correlation with any associated records stored separately from the aeroplane.</td></tr>
<tr><td>6</td><td>D-FIS</td><td></td><td>D-FIS is an ATN service. All implemented up and downlink messages to be recorded</td></tr>
<tr><td>7</td><td>TWIP</td><td>TWIP messages</td><td>Terminal weather information for pilots</td></tr>
<tr><td>8</td><td>D-ATIS</td><td>ATIS messages</td><td>EUROCAE ED-89A Data Link Application System Document (DLASD) for the “ATIS” Data Link Service</td></tr>
<tr><td>9</td><td>OCL</td><td>OCL messages</td><td>EUROCAE ED-106A Data Link Application System Document (DLASD) for “Oceanic Clearance” (OCL) Data-link Service</td></tr>
<tr><td>10</td><td>DCL</td><td>DCL messages</td><td>EUROCAE ED-85A Data Link Application System Document (DLASD) for “Departure Clearance” Data-Link Service</td></tr>
<tr><td>11</td><td>Graphics</td><td>Weather maps & other graphics</td><td>Graphics exchanged in the framework of procedures within the operational control, as specified in Part-OR.
Information that enables correlation with any associated records stored separately from the aeroplane.</td></tr>
</table></td><td></td><td></td></tr>
</table>

A: Rule				B: Summary of comments	C: Reason for change, remarks
12	AOC	Aeronautical operational control messages	Messages exchanged in the framework of procedures within the operational control, as specified in Part-OR. Information that enables correlation with any associated records stored separately from the aeroplane. Definition in ED-112.		
13	Surveillance	CAP, SAP	Use definition in ED-93.		
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 ATSCAir 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 FANSFuture Air Navigation System FLIPCY Flight Plan Consistency OCL Oceanic Clearance SAP System Access Parameters TWIPTerminal Weather Information for Pilots					
AMC OPS.GEN.505(d) Preservation of FDR and CVR recordings - Aeroplanes and Helicopters					
OPERATIONAL CHECKS AND EVALUATIONS OF RECORDINGS OF REPRESENTATIVE FLIGHT					
Whenever a recorder is required to be carried, the operator should:					
1. save the recordings for the period of operating time as required by OPS.GEN.490, OPS.GEN.495 and OPS.GEN.500, except that, for the purpose of testing ad maintaining recorders, up to one hour of the oldest recorded material at the time					1. This provision has been brought back to the requirement, as it was a "shall" in EU-OPS 1.160.

A: Rule	B: Summary of comments	C: Reason for change, remarks
of testing may be erased;		
2. keep a document which presents the information necessary to retrieve and convert the stored data into engineering units; and		1. This provision has been brought back to the requirement, as it was a "shall" in EU-OPS 1.160.
3. at all times, preserve a record of at least one representative flight made within the last 12 months which includes a take-off, climb, cruise, descent, approach to landing and landing, together with a means of identifying the record with the flight to which it relates.	1. (MS: 1; INDUS: 0; INDIV: 0) Indications on the necessity to conduct recorder regular inspection and FDR regular calibration checks are missing. Align with ICAO Annex 6 recommended practices.	1. Safety justification: These are essential checks as they are the only reliable mean to ensure that the recorders perform according to the requirements. These checks are recommended by EASA SIB 2009-29 for the FDR and the CVR.
GM OPS.GEN.505(b) and (c) Preservation of FDR and CVR recordings - Aeroplanes and Helicopters	1. (MS: 1; INDUS: 0; INDIV: 0) Indications on the necessity to conduct recorder regular inspection and FDR regular calibration checks are missing. Align with ICAO Annex 6 recommended practices.	1. Safety justification These are essential checks as they are the only reliable mean to ensure that the recorders perform according to the requirements. This check is recommended by EASA SIB 2009-29. Moved to operational procedures Rules.
REMOVAL OF RECORDERS, INSPECTIONS AND MAINTENANCE	1. (MS: 0; INDUS: 0; INDIV: 1) AMC OPS.CAT.505 (d), Point 3 can possibly collide with OPS.CAT.510.A (a), and the flight crew may not approve that a CVR recording with their voices recording on it be retained for 12 months.	1. Regulatory justification: The intent of this paragraph is already covered by CAT.IDE.505 (e), which requires saving the FDR recording for the period of operating time of the FDR. There is no requirement of saving CVR recording in EU-OPS or TGL 44. Moved to operational procedures Rules.
1. The need for removal of the FDR data from the aircraft will be determined by the investigating authority with due regard to the seriousness of an occurrence and the circumstances, including the impact on the operation.		1. Editorial justification: "(…) removal of the FDR data from the aircraft" does not make sense. It is probably the recorders as equipment which are meant here. Moved to operational procedures Rules.
2. Procedures for the inspections and maintenance practices of the FDR and CVR systems are given in Attachment A of ICAO Annex 6, Part II and in Annex I-B of		Moved to operational procedures Rules.

A: Rule	B: Summary of comments	C: Reason for change, remarks
EUROCAE ED-112.		
GM OPS.GEN.505(d) Preservation of FDR and CVR recordings - Aeroplanes and Helicopters		1. Regulatory justification: The intent of this paragraph is already covered by CAT.IDE.505 (e), which requires saving the FDR recording for the period of operating time of the FDR. Moved to operational procedures Rules.
OPERATIONAL CHECKS AND EVALUATIONS OF RECORDINGS OF REPRESENTATIVE FLIGHT	1. The title does not correspond to the content of OPS.CAT.505(b) and (c).	1. Editorial
The representative flight may not be possible to be preserved if:		1. Moved to operational procedures Rules.
1. there are technical reasons as to why all the data cannot be preserved; and/or		1. Moved to operational procedures Rules.
2. the aircraft may have been dispatched with unserviceable recording equipment, as permitted by the operators' MEL.		1. Moved to operational procedures Rules.
AMC OPS.GEN.515(b) and OPS.GEN.520(a) Microphones - Aeroplanes and Helicopters and Flight Crew interphone system		
HEADSETS		
1. A headset consists of a communication device which includes two earphones to receive and a microphone to transmit audio signals to the aircraft'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.	1. (MS: 0; IND: 1; INDIV: 0) The sentence "Headset boom microphones should be of noise cancelling type" is not clear. Usually there is a squelch doing that and located in the audio panel.	1. The wording is in line with TGL 44.
2. 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 aircraft.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
GM OPS.GEN.515(b) and OPS.GEN.520(a) Microphones - Aeroplanes and Helicopters and Flight Crew interphone system		
HEADSETS		
The term 'headset' includes any aviation helmet incorporating headphones and micro-phone worn by a flight crew member.		
AMC OPS.GEN.520 Flight Crew interphone system		
GENERAL		
The flight crew interphone system should not be of a handheld type.		
GM OPS.GEN.525(b) Communication equipment		
AERONAUTICAL EMERGENCY FREQUENCY		
The aeronautical emergency frequency is 121.5 MHz.		
AMC OPS.GEN.530 Pressure-altitude-reporting transponder		
GENERAL		
1. The SSR transponder of aircraft being operated under European air traffic control should comply with any applicable Single European Sky legislation.		
2. If the Single European Sky legislation is not applicable, the SSR transponder should operate in accordance with the relevant provisions of Volume IV of ICAO Annex 10.		
3. The SSR transponder may have additional capabilities, if so required by the applicable airspace requirements.	1. (MS: 0; IND: 1; INDIV: 0) This has a double standard. The requirement is for the additional SSR facilities to be carried when re-quired by the airspace. The statement then gives the option of carriage. Incorrect use of the word 'may' creates this problem. The wording should be "The airspace may require additional SSR transponder ca-pabilities."	1. Wording improvement.
AMC OPS.GEN.535(a) Navigation equipment		
VISUAL REFERENCE TO LANDMARKS		
Navigation for flight under visual flight rules may be accomplished by visual reference		

A: Rule	B: Summary of comments	C: Reason for change, remarks
to landmarks.		
GM OPS.GEN.535(a)(2) Navigation equipment		
APPLICABLE AIRSPACE REQUIREMENTS		
For aircraft being operated under European air traffic control, the applicable airspace requirements include the Single European Sky legislation. .		
GM OPS.GEN.535(b) Navigation equipment		
NUMBER OF NAVIGATION EQUIPMENTS		
The requirement in OPS.GEN.535(b) may be met by means other than the duplication of equipment.	1. (MS: 1; IND: 0; INDIV: 0) The GM is vague and does not offer any guidance. It can be deleted.	1. Accepted
AMC OPS.GEN.525 and 535 Communication equipment and Navigation equipment		
GENERAL		
When compliance with OPS.GEN.525 and OPS.GEN.535 requires more than one communication or navigation equipment unit to be provided, each should be independent of the other(s), to the extent that a failure in any one will not result in failure of any other AMC OPS.GEN.540.A(b) Electronic Navigation Data Management - complex motor-powered aeroplanes		
NAVIGATION DATA PRODUCTS NEEDED FOR OPERATIONS IN ACCORDANCE WITH OPS.SPA		
1. When an operator of a complex motor-powered aeroplane uses a navigation database which supports an airborne navigation application as a primary means of navigation, the navigation database supplier should hold a Type 2 Letter of Acceptance (LoA), or equivalent.	1. (MS: 0; IND:2;INDIV: 0) EASA need to send this paragraph back to experts. It is currently understood that such Type 2 LOA are required only for P-RNAV approval, not for B-RNAV approval. Can B-RNAV be the primary means of navigation?	1. It is correct that P-RNAV operations require a specific approval, in accordance with Part SPA and a type 2 LoA (or equivalent) is needed for this purpose. B-RNAV instead does not require a specific approval and can be used as primary means of navigation.
	2. (MS: 0; IND: 1; INDIV: 0) From EASA's CONDITIONS FOR THE ISSUANCE OF LETTERS OF ACCEPTANCE FOR NAVIGATION DATABASE SUPPLIERS BY THE AGENCY, the definition of a Navigation Database is as follows: Navigation Data-	2. Noted. This may be addressed in another rulemaking task.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	base - Data (such as navigation information, flight planning waypoints, airways, navigation facilities, SID, STAR) that is stored electronically in a system that supports an airborne navigation application. Jeppesen's Position on Navigation Databases and Acceptable Means of Compliance Navigation Databases covered under a Type 2 Letter of Acceptance (LoA) should include more database types than those cited above, and should be applicable to all phases of flight (not just airborne) including databases utilized for navigation from gate-to-gate. By expanding the definition beyond airborne to all phases of flight, EASA will be more closely harmonized with other regulatory agencies like the FAA. Other benefits of the expanded navigation database definition will include additional data being available for flight crews including the offering of three dimensional data (these data types include vertical data). These additional navigational database types include terrain, obstacles, and airport moving map, and each of these data types offer additional information for flight crews to utilize for gate-to-gate navigation. Therefore, Jeppesen proposes EASA expand the acceptable means of compliance to recognize and include these other forms of navigational databases. The EASA "CONDITIONS FOR THE ISSUANCE OF LETTERS OF ACCEPTANCE FOR NAVIGATION DATABASE SUPPLIERS BY THE AGENCY" should be reviewed accordingly.	
2. If this airborne navigation application is needed for an operation requiring a specific approval in accordance with OPS.SPA, the operator's procedures should be based upon the Type 2 LoA acceptance process.		
3. A Type 2 LoA is issued by the Agency in accordance with the Agency's Opinion Nr. 01/2005 on The Acceptance of Navigation Database Suppliers (hereinafter referred to as the Agency's Opinion Nr. 01/2005). The definitions of navigation database, navigation database supplier, data application integrator, Type 1 LoA and Type 2 LoA can be found in the Agency's Opinion Nr. 01/2005.		
4. Equivalent to a Type 2 LoA is the FAA Type 2 LoA, issued in accordance with the Federal Aviation Administration (FAA) Advisory Circular AC 20-153 , and the Transport Canada Civil Aviation (TCCA) 'Acknowledgement Letter of an Aeronautical Data Process' which uses the same basis.		
5. EUROCAE ED-76/Radio Technical Commission for Aeronautics (RTCA) DO-200A Standards for Processing Aeronautical Data contains guidance relating to the		

A: Rule	B: Summary of comments	C: Reason for change, remarks
processes which the supplier may follow.		
Subpart B - Section IV - Instruments, data and equipment		
AMC OPS.CAT.405 Hand fire extinguishers – Motor-powered aircraft	1. (MS=0; INDUS=10; INDIV=0) We agree. Halon based fire extinguisher are currently the only available solutions which meet the aviation industry's stringent safety requirements. Before viable alternatives are available they should continue to be used in the interest of flight safety. We urge EASA to ensure that the EU does not take any decisions to phase out Halon based extinguishers unless viable alternatives are available which have been endorsed by ICAO at global level.	1. Not accepted. EC 1005/2009 regulation will forbid the use of Halon.
HAND FIRE EXTINGUISHERS – NUMBER, LOCATION AND TYPE		
1. The number and location of hand fire extinguishers should be such as to provide adequate availability for use, account being taken of the number and size of the passenger compartments, the need to minimise the hazard of toxic gas concentrations and the location of toilets, galleys etc. These considerations may result in the number of fire extinguishers being greater than the minimum prescribed.		
2. There should be at least one fire extinguisher suitable for both flammable fluid and electrical equipment fires installed in the cockpit. Additional extinguishers may be required for the protection of other compartments accessible to the crew in flight. Dry chemical fire extinguishers should not be used in the cockpit, or in any compartment not separated by a partition from the cockpit, because of the adverse effect on vision during discharge and, if conductive, interference with electrical contacts by the chemical residues.	1. (MS=0; INDUS=1; INDIV=0) It is not clear whether points 2 and 6 in AMC OPS.CAT.405 are complimentary. Certainly if the Halon 1211 meets the requirement as being 'suitable for both flammable fluid and electrical equipment' it is not clear why there are two sets of requirements. 2. (MS=0; INDUS=2;INDIV=0) Paragraph 2, as written, is slightly confusing. Justification: Clarification. Proposed text : "There should be at least one fire extinguisher installed in the cockpit and this should be suitable for fighting both flammable fluid and electrical fires".	1. See 1 above 2. Wording improved.
3. Where only one hand fire extinguisher is required in the passenger compartments it should be located near the cabin crew member's station, where provided.		
4. Where two or more hand fire extinguishers are required in the passenger compartments and their location is not otherwise dictated by consideration of paragraph OPS.CAT.405(a), an extinguisher should be located near each end of		

A: Rule	B: Summary of comments	C: Reason for change, remarks
the cabin with the remainder distributed throughout the cabin as evenly as is practicable.		
5. Unless an extinguisher is clearly visible, its location should be indicated by a placard or sign. Appropriate symbols may also be used to supplement such a placard or sign.		
6. The fire extinguishers located in the cockpit should contain Halon 1211 (bromochlorodifluoro-methane, CBrCIF2) or an equivalent extinguishing agent.	1. (MS=1; INDUS=0; INDIV=0) Inconsistent symbology for Halon 1211. Bromochlo-rodiflouromethane should be written with a "lower-case" 2 i.e. CBClF2 Justification: Clarification and consistency.	1. Not accepted. EC 1005/2009 regulation will forbid the use of Halon. Reference to Halon is removed.
7. For aeroplanes with a maximum approved passenger seating configuration between 31 and 60, one of the required fire extinguishers located in the passenger compartment should contain Halon 1211 (bromochlorodi-fluoromethane, CBrCIF2) or an equivalent extinguishing agent.		
8. For aeroplanes with a maximum approved passenger seating configuration of more than 61, at least two of the fire extinguishers located in the passenger compartment should contain Halon 1211 (bromochlorodi-fluoromethane, CBrCIF2) or an equivalent extinguishing agent.		
AMC OPS.CAT.406.A Safety harness - Aeroplanes		1. Included at IR level.
UPPER TORSO RESTRAINT SYSTEM		
The safety harness should be an upper torso restraint system		
AMC OPS.CAT.407.A Number of spare electrical fuses - Aeroplanes		
SPARE ELECTRICAL FUSES		
A spare electrical fuse means a replaceable fuse in the cockpit, not an automatic circuit breaker, or circuit breakers in the electric compartments.		
AMC OPS.CAT.410 Flight instruments and equipment for VFR flights – Motor powered aircraft & OPS.CAT.415 Flight instruments and equipment for VFR night flights and IFR flights – Motor powered aircraft		1. AMC is introduced to reflect content of EU-OPS/JAR-OPS 3 1.650 (j) for local flights.
All AMCs to OPS.GEN.410 and OPS.GEN.415 should be used to show compliance with OPS.CAT.410 and OPS.CAT.415 as applicable.		

<table>
<tr><th>A: Rule</th><th>B: Summary of comments</th><th>C: Reason for change, remarks</th></tr>
<tr><td>GM OPS.CAT.410.A Flight instruments and equipment for VFR flights – Motor powered aircraft & OPS.CAT.415.A Flight instruments and equipment for VFR night flights and IFR flights – Motor powered aircraft - Aeroplanes</td><td></td><td></td></tr>
<tr><td>NUMBERS OF EQUIPMENT</td><td></td><td></td></tr>
<tr><td>Guidance on implementation of OPS.CAT.410 and OPS.CAT.415 is given in Table 1 GM.OPS.CAT.410.A & 415.A - Aeroplanes.</td><td></td><td></td></tr>
<tr><td>Table 1A GM.OPS.CAT.410 & 415. - Aeroplanes

<table>
<tr><td>SERIAL</td><td colspan="2">FLIGHTS UNDER VFR</td><td colspan="3">FLIGHTS UNDER IFR OR AT NIGHT</td></tr>
<tr><td>INSTRUMENT</td><td>SINGLE PILOT</td><td>TWO PILOTS REQUIRED</td><td>MAX T/O MASS AUTH>5 700 kg OR MAX PASS>9</td><td>SINGLE PILOT</td><td>TWO PILOTS REQUIRED</td><td>MAX T/O MASS AUTH>5 700 kg OR MAX PASS>9</td></tr>
<tr><td colspan="2">(a)</td><td>(b)</td><td>(c)</td><td>(d)</td><td>(e)</td><td>(f)</td><td>(g)</td></tr>
<tr><td>1</td><td>Magnetic compass</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td>2</td><td>Accurate time piece</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td>3</td><td>OAT indicator</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td><td>1</td></tr>
<tr><td>4</td><td>Sensitive pressure altimeter</td><td>1</td><td>2</td><td>2</td><td>2
*****</td><td>2
*****</td><td>2
*****</td></tr>
<tr><td>5</td><td>Air speed indicator</td><td>1</td><td>2</td><td>2</td><td>1</td><td>2</td><td>2</td></tr>
<tr><td>6</td><td>Heated pitot system</td><td></td><td></td><td>2</td><td>1</td><td>2</td><td>2</td></tr>
</table>
</td><td>1. (MS=1; INDUS=0; INDIV=0)

The system of attaching notes by referring to asterisks is unwieldy and subject to error. Justification: Clarity. Proposed Text (if applicable): delete asterisks, insert notes. […]

1. (MS=1; INDUS=0; INDIV=0)

Column (d), line 6 "Heated pitot system" add "applicable to aeroplanes first issued with an individual certificate of airworthiness on or after 1st April 1999. Adapt the number according for the number of pilots: 1 for single pilot, 2 when 2 pilots are required.

2. (MS=1; INDUS=0; INDIV=0)

Line 5, column g: add "applicable to aeroplanes first issued with an individual certificate of airworthiness on or after 1st April 1998".</td><td>1.

The system of notes is adopted

1.

Accepted, note (6) and (7) are added to reflect the appropriate applicability criteria.

1.

Static pressure source added in row (13) as per CAT.IDE.A.220 (f) & (g).</td></tr>
</table>

A: Rule	B: Summary of comments	C: Reason for change, remarks

7	Pitot heat failure indicator						2
8	Vertical speed indicator	1	2	2	1	2	2
9	Turn and slip indicator or turn co-ordinator	1 *	2 * &**	2 * &**	1 ****	2 ****	2 ****
10	Attitude indicator	1 *	2 * &**	2 * &**	1	2	2
11	Gyroscopic direction indicator	1 *	2 * &**	2 * &**	1	2	2
12	Standby attitude indicator						1
13	Mach number indicator	***					

* For local flights (A to A, 50 nm radius, not more than 60 minutes duration) the instruments at Serials 9(b) 10(b) and 11 (b) may be replaced by either a turn and slip indicator, or a turn co-ordinator, or both an attitude indicator and a slip indicator.

** The substitute instruments permitted by * above should be provided at each pilot's station.

*** Serial 13 - A Mach number indicator is required for each pilot whenever compressibility limitations are not otherwise indicated by airspeed indicators.

**** For IFR or at night, a turn and slip indicator, or a slip indicator and a third (standby) attitude indicator certificated according to CS 25.1303(b)(4) or equivalent, is required.

***** Neither three pointers, nor drum pointer altimeters satisfy the requirement.

1. (MS=0; INDUS=1; INDIV=0)

"Neither three pointers, nor drum pointer altimeters satisfy the requirement." At present numerous aircraft are operating with these alternative altimeters under Article 8(2) Regulation (EEC) No 3922/1991 Exemptions. Flights by these (individually designated) aircraft are restricted to flights below 10 000 ft barometric altitude, and are subject to the aircraft being fitted with two fully serviceable sensitive pressure altimeters.

Furthermore the helicopters operating in the same airspace are not subject to such a restriction.

The AMC and GM should be modified to align the requirements for aircraft operating solely below 10 000

1. & 2.

Accepted. Exception is introduced.

<table>
<tr><th>A: Rule</th><th>B: Summary of comments</th><th>C: Reason for change, remarks</th></tr>
<tr><td></td><td>ft (if necessary using further distinction by MTOM or speed).

2. (MS=1; INDUS=0; INDIV=0)

French DGAC has notified to the commission such exemption from § EU-OPS 1.652(c) related to sensitive pressure counter drum-pointer altimeters (as of former TGL 33 R1), according to article 8-2 of Regulation (EEC) 3922/91 for operators operating in a restricted area within the Caribbean Area (the West Indies) as air traffic in this airspace is less heavy than within European Airspace.

Suggest to add “unless for non-pressurized non-complex-motor-powered aeroplanes, operated up to FL 100, and under the applicable airspace requirement”.

Justification: avoid excessive cost for retrofit while respecting safety recommendations from accident investigation boards (TGL 28, TGL 33).</td><td></td></tr>
<tr><td>GM OPS.CAT.410.H Flight instruments and equipment for VFR flights – Motor powered aircraft & OPS.CAT.415.H Flight instruments and equipment for VFR night flights and IFR flights – Motor powered aircraft - Helicopters</td><td></td><td></td></tr>
<tr><td>NUMBERS OF EQUIPMENT</td><td></td><td></td></tr>
<tr><td>Guidance on implementation of OPS.CAT.410 & 415 is given in Table 1 GM OPS.CAT.410.H & 415,H – Helicopters.</td><td></td><td></td></tr>
<tr><td>Table 1H GM OPS.CAT.410 & 415 - Helicopters

<table><tr><th colspan="2" rowspan="2">INSTRUMENT</th><th colspan="2">FLIGHTS UNDER VFR</th><th colspan="2">FLIGHTS UNDER IFR OR AT NIGHT</th></tr><tr><th>SINGLE PILOT</th><th>TWO PILOTS RE-RE-QUIRED</th><th>SINGLE PILOT</th><th>TWO PILOTS RE-RE-QUIRED</th></tr><tr><td>1</td><td>Magnetic direction indicator</td><td>1</td><td>1</td><td>1</td><td>1</td></tr></table></td><td>1. (MS=1; INDUS=0; INDIV=0)

The system of attaching notes by referring to asterisks is unwieldy and subject to error. Justification: Clarity. Proposed text: Delete asterisks, insert Notes. […]</td><td>1.

The system of notes is adopted.</td></tr>
<tr><td></td><td>1. (MS=0; INDUS=1; INDIV=0)

Remove night VFR requirement for chart holder, it is not a requirement in JAR-OPS 3. Editorial: don't use stars (unclear) but a,b,c, for clarity

2. (MS=1; INDUS=0; INDIV=0)

Notes omitted from item 10 ‘attitude indicator’ in table</td><td>1.

Accepted

2.

The note 8 from JAR-OPS 3 is considered not applicable to item “Attitude”.

3.</td></tr>
</table>

A: Rule						B: Summary of comments	C: Reason for change, remarks
2	Accurate time piece	1	1	1	1	3. (MS=0; INDUS=1; INDIV=0) No occurrence of 6 asterisks was found in the table.	Corrected.
3	OAT indicator	1	1	1	1		
4	Sensitive pressure altimeter	1	2	2 *	2		
5	Air speed indicator	1	2	1	2		
6	Heated pitot system	1 **	2 **	1	2		
7	Pitot heateat failure annuciator	-	-	1 ***	2 ***		
8	Vertical speed indicator	1	2	1	2		
9	Slip indicator	1	2	1	2		
10	Attitude indicator	1 ****	2 ****	1	2		
11	Gyroscopic direction indicator	1 ****	2 ****	1 *******	2 *******		
12	Magnetic gyroscopic direction indicator	-	-	1 *******	2 *******		
13	Standby attitude indicator	-	-	1 *****	1 *****		
14	Alternate source of static pressure	-	-	1	1		
15	Chart holder	-	-	1 *******	1 *******		
* For single pilot night VFR night operation one sensitive pressure altimeter may be substituted by a radio altimeter.							
** Required for helicopters with a maximum certificated take-off mass (MCTOM) exceeding 3 175 kg or having a maximum passenger seating configuration (MAPSC) of more than 9.							
*** The pitot heater failure annunciation applies to any helicopter issued with an individual Certificate of Airworthiness after 1 August 1999. It also applies before that date when: the helicopter has a MCTOM exceeding 3 175 kg and a maximum approved passenger seating configuration greater than 9.							1. Note clarified in line with ACJ OPS 3.650/652 Note (3).
**** Required for helicopters with a maximum certificated take-off mass (MCTOM) exceeding 3 175 kg or required for any helicopters when operating over water; when out of sight of land or when the visibility is less than 1500 m .							

A: Rule	B: Summary of comments	C: Reason for change, remarks
***** For helicopters with a maximum certificated take-off mass (MCTOM) exceeding 3175 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. (However, the original type certification standard should be referred to determine the exact requirement.)		
****** For IFR operation only		
*******For VFR night operations only.]		
AMC1 OPS.CAT.415(a)(2) Flight instruments and equipment for VFR night flights and IFR flights – Motor powered aircraft		
MEANS OF INDICATING PITOT HEATER FAILURE		
A combined means of indicating pitot heater failure is acceptable provided that is visible from each flight crew station and that there is a means to identify the failed heater in systems with two or more sensors.		1. Wording modified in line with the IR wording.
AMC OPS.CAT.415.A(a) Flight instruments and equipment for VFR night flights and IFR flights – Motor powered aircraft		1. The content of this AMC is partially moved at IR level.
TURN AND SLIP INDICATORS FOR AEROPLANES WITH MCTOM ABOVE 5700 KG		1. The mass criteria are deleted as not appearing in the source rules.
If the standby attitude instrument system is certificated according to CS 25.1303(b)(4) or equivalent, the turn and slip indicators required by OPS.CAT.415 (a) may be replaced by slip indicators for aeroplanes.		
AMC OPS.CAT.415(a)(4) Flight instruments and equipment for VFR night flights and IFR flights – Motor powered aircraft		
STANDBY ALTITUDE INDICATOR		
1. The standby attitude indicator (artificial horizon) should: a. be powered continuously during normal operation and, in the event of a total failure of the normal electrical generating system, be powered from a source independent of the normal electrical generating system; b. for aeroplanes, provide reliable operation for a minimum of 30 minutes after total failure of the normal electrical generating system, taking into account other loads on the emergency power supply and operational procedures; c. for helicopters, provide 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		1. Clarification of the standby attitude specifications in line with IR text.

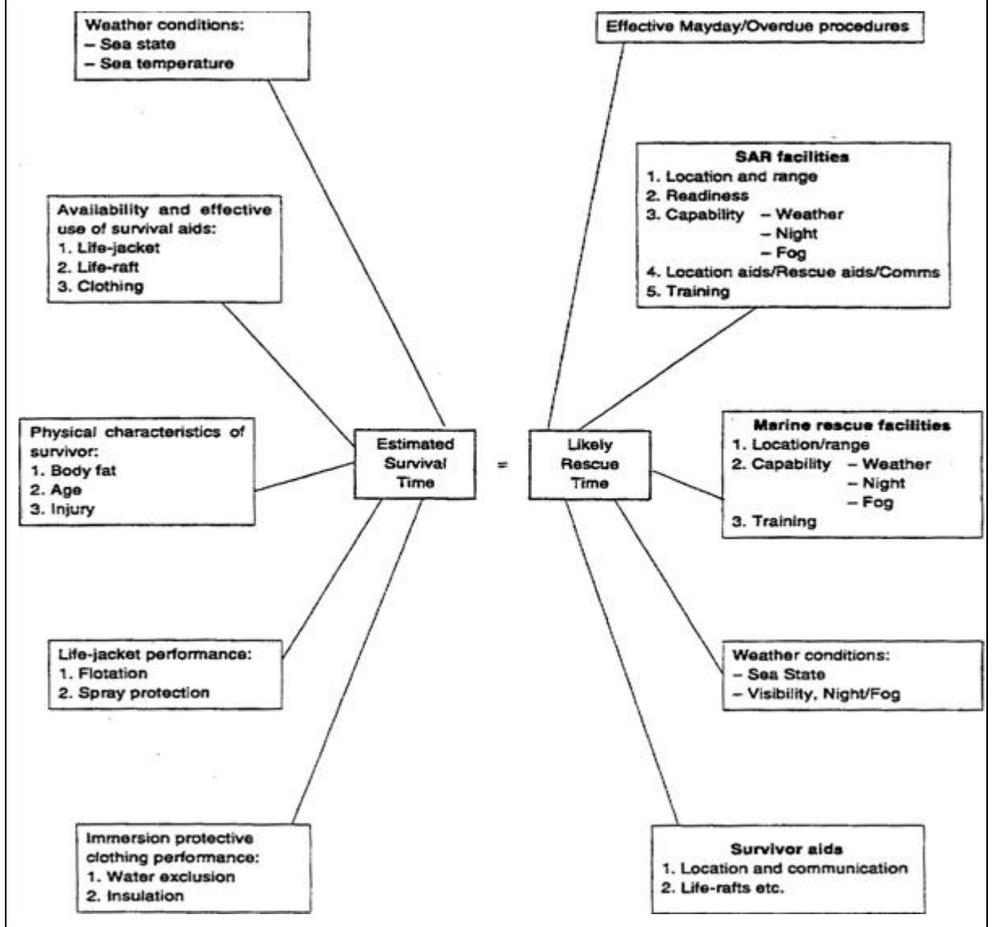
A: Rule	B: Summary of comments	C: Reason for change, remarks
on the emergency power supply and operational procedures; d. operate independently of any other attitude indicating system; e. continue to operate automatically after total failure of the normal electrical generating system; and f. be appropriately illuminated during all phases of operation.		
2. Where the standby attitude indicator has its own dedicated power supply, there should be an associated indication, either on the instrument or on the instrument panel, when this supply is in use.		
3. Aeroplanes involved in commercial air transport, with a maximum certificated take-off mass of 5 700 kg or less and already registered in the EU on 1 April 1995, should be equipped with a standby attitude indicator which may be located in the left-hand instrument panel.		
AMC OPS.CAT.416 Airborne weather equipment		
AIRBORNE WEATHER RADAR		
The airborne weather equipment should be an airborne weather radar.		
AMC OPS.CAT.417.A Windshield wipers - Aeroplanes		
WINDSHIELD WIPERS		
The means used to maintain a clear portion of the windshield during precipitation should be windshield wipers or an equivalent		
AMC OPS.CAT.418.H Radio altimeters - Helicopters		
AUDIO VOICE ALERTING DEVICE		
The audio warning required in OPS.CAT.H.418 should be a voice warning.		
AMC1 OPS.CAT.420.A(a) Flights over water – Motor powered aircraft		1. Content included at IR level.
LIFE JACKETS – AEROPLANES		
1. Landplanes should be equipped with life jackets incorporating a survivor locator light for each person on board when flying over water at a distance of more than 50 nautical miles from the shore.		
2. Life jackets for infants may be substituted by other approved flotation devices equipped with a survivor locator light.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
AMC2 OPS.CAT.420.A(a) Flights over water - Motor powered aircraft		
LIFE –SAVING RAFTS AND EQUIPMENT FOR MAKING DISTRESS SIGNALS - AEROPLANES		
1. The following should be readily available with each life-raft: a. Means for maintaining buoyancy; b. A sea anchor: c. Life-lines and means of attaching one life-raft to another; d. Paddles for life-rafts with a capacity of 6 or less; e. Means of protecting the occupants from the elements; f. A water resistant torch; g. Signalling equipment to make the pyrotechnical distress signals described in ICAO Annex 2; h. 100 g of glucose tablets for each 4, or fraction of 4, persons which the life-raft is designed to carry: i. At least 2 litres of drinkable water provided in durable containers or means of making sea water drinkable or a combination of both; and j. First-aid equipment.		
2. As far as practicable, items listed in 1. should be contained in a pack.		
GM OPS.CAT.420.H(b)(2) Flight over water - Motor powered aircraft		
INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA - HELICOPTERS		
International Regulations for Preventing Collisions at Sea are those which were published by the International Maritime Organization (IMO) in 1972.		
AMC OPS.CAT.420.H(b) Flights over water - Motor powered aircraft		
LIFE –SAVING RAFTS AND EQUIPMENT FOR MAKING DISTRESS SIGNALS - HELICOPTERS		
1. Life-saving rafts in sufficient numbers to carry all persons on board should be: a. 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; and b. 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. Should one life-raft of the largest rated capacity be lost,		

A: Rule	B: Summary of comments	C: Reason for change, remarks
the overload capacity of the remaining life-raft(s) should be sufficient to accommodate all persons on the helicopter.		
2. Each required life-saving raft should conform to the following specifications: a. be of an approved design and stowed so as to facilitate their ready use in an emergency; b. be radar conspicuous to standard airborne radar equipment; c. 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; d. life-rafts which 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.		
3. Each required life-raft should contain at least the following: a. One approved survivor locator light; b. One approved visual signalling device; c. One canopy (for use as a sail, sunshade or rain catcher) or other mean to protect occupants from the elements; d. One radar reflector; e. One 20 m retaining line designed to hold the life-raft near the helicopter but to release it if the helicopter becomes totally submerged; f. One sea anchor;		
g. One survival kit, appropriately equipped for the route to be flown, which 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. Seasickness tablets; viii. One first-aid kit; ix. One portable means of illumination; x. One half litre of pure water and one sea water desalting kit; xi. One comprehensive illustrated survival booklet in an appropriate language.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
4. The equipment for making distress signal should be at least one survival Emergency Locator Transmitter (ELT(S)) for each life-raft carried (but not more than a total of 2 ELTs are required), capable of performing in accordance with AMC2 OPS.GEN.430.		1. Included at the IR level: CAT.IDE.A/H.395 (a)(3).
GM OPS.CAT.426.H Crew Survival Suits - Helicopters		
ESTIMATING SURVIVAL TIME		
1. Introduction		
a. A person accidentally immersed in cold seas (typically offshore Northern Europe) will have a better chance of survival if he is wearing an effective survival suit in addition to a life-jacket. By wearing the survival suit, he/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.		
b. 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.		
2. Survival times		
a. 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 of GM OPS.CAT.426.H. 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 of GM OPS.CAT.426.H - The survival equation		

A: Rule	B: Summary of comments	C: Reason for change, remarks



b. Broad estimates of likely survival times for the thin individual offshore are given in Table 1 of GM OPS.CAT.426.H. 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 of GM OPS.CAT.426.H - 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)

A: Rule	B: Summary of comments	C: Reason for change, remarks

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

c. 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.

d. 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.

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

GM OPS.CAT.427.H(b) Additional requirements for helicopters operating to or from helidecks located in a hostile sea area.

INSTALLATION OF THE LIFE RAFT SO AS TO BE USABLE IN THE SEA CONDITIONS

A: Rule	B: Summary of comments	C: Reason for change, remarks
1. Projections on the exterior surface of the helicopter, which are located in a zone delineated by boundaries which are 1.22 m (4 ft) above and 0.61 m (2 ft) below the established static water line could cause damage to a deployed liferaft. Examples of projections which need to be considered are aerials, overboard vents, unprotected split-pin tails, guttering and any projection sharper than a three dimensional right angled corner.		
2. While the boundaries specified in paragraph 1 are intended as a guide, the total area which 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.		
3. 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.		
4. Particular care should also be taken during routine maintenance to ensure that additional hazards are not introduced by, for example, leaving inspection panels with sharp corners proud of the surrounding fuselage surface, or allowing door sills to deteriorate to a point where sharp edges become a hazard.		
5. The same considerations apply in respect of emergency flotation equipment.		
AMC1 OPS.CAT.432 Megaphones - Motor powered aircraft		
LOCATION OF MEGAPHONES		
1. Where one megaphone is required, it should be readily accessible at the assigned seat of a cabin crew member or crew members other than flight crew.		
2. Where two or more megaphones are required, they should be suitably distributed in the passenger cabin(s) and readily accessible to crew members assigned to direct emergency evacuations.		
3. Notwithstanding 1 and 2, 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.		
AMC2 OPS.CAT.432 Megaphones - Motor powered aircraft		1. Content moved at rule level
NUMBER OF MEGAPHONES - AEROPLANES		
1. For each passenger deck:		
Table 1A AMC OPS.CAT.432 Megaphones – Motor powered aircraft		

A: Rule	B: Summary of comments	C: Reason for change, remarks
<table><tr><td>Passenger seating configuration</td><td>Number of Megaphones</td></tr><tr><td>61 to 99</td><td>1</td></tr><tr><td>100 or more</td><td>2</td></tr></table> 2. For aeroplanes with more than one passenger deck, or in all cases when the maximum passenger seating configuration is more than 60, at least 1 megaphone should be carried.		
AMC1 OPS.CAT.440 High altitude flights - Oxygen requirements - Motor powered aircraft	1. (MS: 0; INDUS: 1; INDIV: 0): Editorial change: should be amended to read "High altitude flights - Supplemental oxygen [...]".	1. The title of the paragraph is changed in line with EU-OPS/JAR-OPS 3.
AEROPLANES AND HELICOPTERS		
1. In the determination of oxygen for the routes to be flown, it is assumed that the aircraft will descend in accordance with the emergency procedures specified in the operations manual, without exceeding its operating limitations, to a flight altitude that will allow the flight to be completed safely (ie. flight altitudes ensuring adequate terrain clearance, navigational accuracy, hazardous weather avoidance etc.).		
PRESSURISED AEROPLANES		
2. The amount of oxygen should be determined on the basis of cabin pressure altitude, flight duration and, for pressurised aeroplanes, on the assumption that a cabin pressurisation failure will occur at the pressure altitude or point of flight that is most critical from the standpoint of oxygen need, and that, after the failure, the aircraft will descend in accordance with emergency procedures specified in the Aircraft Flight Manual to a safe altitude for the route to be flown that will allow continued safe flight and landing.		
3. Following a cabin pressurisation failure, the cabin pressure altitude should be considered to be the same as the aeroplane pressure altitude, unless it can be demonstrated to the competent authority that no probable failure of the cabin or pressurisation system will result in a cabin pressure altitude equal to the aeroplane pressure altitude. Under these circumstances, the demonstrated maximum cabin pressure altitude may be used as a basis for determination of oxygen supply.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
AMC2 OPS.CAT.440 High altitude flights - Oxygen requirements - Motor powered aircraft		
OXYGEN REQUIREMENTS FOR COCKPIT SEAT OCCUPANTS AND CABIN CREW CARRIED IN ADDITION TO THE REQUIRED MINIMUM NUMBER OF CABIN CREW		
1. When cockpit seat occupants are: a. supplied with oxygen from the flight crew source of oxygen, should be considered as flight crew members; b. not supplied with oxygen by the flight crew source of oxygen, should be considered as passengers.		
2. Cabin crew members carried in addition to the minimum number of cabin crew and additional crew members should be considered as passengers for the purpose of oxygen supply.		
GM1 OPS.CAT.440 High altitude flights - Oxygen requirements - Motor powered aircraft	1. (MS: 1; INDUS: 0; INDIV: 0): Notes providing by this GM are incorrect. In addition, not considered as GM only. GM to be deleted and original notes of the EU.OPS / JAR.OPS 3 to be re-integrated into the tables. 2. (MS: 1; INDUS: 10; INDIV: 0): The guidance contradicts the rule. Inconsistencies between the GM and the tables. To be re-aligned w/ EU-OPS.	1. & 2. Partially accepted - GM1 amended in compliance with Appendix 1 to OPS 1.770 / OPS 1.775 / JAR-OPS 3.775 and updated into an AMC.
CLARIFICATION OF THE OXYGEN REQUIREMENTS IN TABLE 1 OPS.CAT.440. AND TABLE 2 OPS.CAT.440.		
1. The required minimum supply in Table 1 OPS.CAT.440. 5 and Table 2 OPS.CAT.440. 4 is the quantity of oxygen necessary for a constant rate of descent from the aeroplane's maximum certificated operating altitude to 10 000 ft in 10 minutes and followed by 20 minutes at 10 000 ft.		
2. The required minimum supply in Table 2 OPS.CAT.440. 4 is the quantity of oxygen necessary for a constant rate of descent from the aeroplane's maximum certificated operating altitude to 10 000 ft in 10 minutes followed by 110 minutes at 10 000 ft.	1. (MS: 0; INDUS: 1; INDIV: 0): Table 2 is also applicable to aircraft, and not only aeroplane. "[...] aeroplane's max. certificated operating altitude [...]" to be amended.	1. No change - Paragraph 2 is actually only applicable to pressurised aeroplanes. New proposal in line w/ Appendix 1 to OPS 1.770 / OPS 1.775 / JAR-OPS 3.775.
3. Passenger numbers are passengers actually carried, including infants under the age of 2 years.		
4. The required minimum supply in Table 1 OPS.CAT.440. 4 is the quantity of oxygen necessary for a constant rate of descent from the aeroplane's maximum		

A: Rule	B: Summary of comments	C: Reason for change, remarks
certificated operating altitude to 15 000 ft in 10 minutes.		
GM2 OPS.CAT.440 High altitude flights - Oxygen requirements - Motor powered aircraft		
CREW MEMBERS OTHER THAN FLIGHT CREW		
The crew members assisting flight crew in their duties are crew members other than flight crew and cabin crew. (e.g. HEMS crew members, hoist crew members).		
GM OPS.CAT.440(b)(1) High altitude flights - Oxygen requirements - Motor powered aircraft		
QUICK DONNING MASKS	1. (MS: 1; INDUS: 0; INDIV: 0): For clarity purpose, the GM should be amended to refer to AMC OPS.GEN.440(a).	1. No change - the AMC OPS.GEN.440(a) already refers to GM OPS.CAT.440(b)(1).
Quick donning mask is a type of mask that:		
1. can be placed on the face from its ready position, properly secured, sealed and supplying oxygen upon demand, with one hand and within five seconds and will thereafter remain in position, both hands being free;		
2. can be donned without disturbing eye glasses and without delaying the flight crew member from proceeding with assigned emergency duties;		
3. once donned, does not prevent immediate communication between the flight crew members and other crew members over the aircraft intercommunication system; and		
4. does not inhibit radio communications.		
AMC OPS.CAT.442.A Crew protective breathing equipment – Aeroplanes		
PROTECTIVE BREATHING EQUIPMENT		
1. While in use, a PBE should not inhibit communication.		
2. The requirement for PBEs for flight crew may be met by the oxygen requirements.		1. The AMC text is aligned with EU-OPS/JAR-OPS 3 1.780 (a) (1) text.
AMC OPS.CAT.447.A First aid oxygen - Aeroplanes		
TYPE AND QUANTITY OF FIRST AID OXYGEN		

A: Rule	B: Summary of comments	C: Reason for change, remarks
1. The amount of oxygen should be calculated using an average flow rate of at least 3 litres Standard Temperature Pressure Dry (STPD)/minute/person. It should be sufficient for the remainder of the flight after cabin depressurisation between a cabin altitude of 8000 ft and 15 000 ft, for at least 2% of the passengers carried, but not less than one person. There should be at least two dispensing units that may be portable.		1. Content of this AMC is partially moved at IR level.
2. The oxygen equipment should be capable of generating a mass flow to each user of at least four litres per minute, STPD. Means may be provided to decrease the flow to not less than two litres per minute, STPD, at any altitude.		
GM OPS.CAT.447.A First aid oxygen – Aeroplanes		
GENERAL		
1. First aid oxygen is intended for those passengers who, having been provided with the oxygen required under OPS.CAT.440, still need to breathe undiluted oxygen when the amount of oxygen has been exhausted.		
2. When calculating the amount of first-aid oxygen, an operator should take into account the fact that, following a cabin depressurisation, supplemental oxygen as calculated in accordance with Table 1 OPS.CAT.440 and Table 2 OPS.CAT.440 should be sufficient to cope with hypoxic problems for: a. all passengers when the cabin altitude is above 15 000 ft; and b. a proportion of the passengers carried when the cabin altitude is between 10 000 ft and 15 000 ft.		
3. For the above reasons, the amount of first-aid oxygen should be calculated for the part of the flight after cabin depressurisation during which the cabin altitude is between 8000 ft and 15 000 ft, when supplemental oxygen may no longer be available.		
4. Moreover, following cabin depressurisation an emergency descent should be carried out to the lowest altitude compatible with the safety of the flight. In addition, in these circumstances, the aeroplane should land at the first available aerodrome at the earliest opportunity.		
5. The conditions above may reduce the period of time during which the first-aid oxygen may be required and consequently may limit the amount of first-aid oxygen to be carried on board.		
AMC OPS.CAT.457.A Emergency medical kit – Aeroplanes		
CONTENT OF EMERGENCY MEDICAL KIT		

A: Rule	B: Summary of comments	C: Reason for change, remarks
1. Emergency Medical Kits (EMKs) should be equipped with appropriate and sufficient medications and instrumentation. However, these kits should be adapted by the operator according to the characteristics of the operation (scope of operation, flight duration, number and demographics of passengers etc.).		1. There are 32 comments (cts) on this paragraph in the CRT, 9 cts are unique comments and need to be evaluated. One comment from ECA is a request for clarification. The origin of the comments shows that only the UK (CAA UK and 2 operators) have objections against part of the proposed content of the emergency medical kit (EMK), and that the vast majority of airlines, NAAs and organisations obviously agree with the proposal. The absence of even a single comment from AEA supports the view that operators agree with the content of EMKs. The absence of comments from doctors leads to the assumption that medical specialists have no objections. The comment from ECA is a question as to whether "the automated external defibrillator is supposed to be carried in all flights, all kind of operation irrespective of the size of the aircraft". This leads to the conclusion that pilot associations do not have objections.
2. The following should be included in the EMKs:		
a. Equipment: i. Sphygmomanometer – non mercury ii. Stethoscope iii. Syringes and needles iv. IV cannulae (if IV fluids are carried in the FAK a sufficient supply of IV cannulae should be stored there as well) v. Oropharyngeal airways (3 sizes) vi. Tourniquet vii. Disposable gloves viii. Needle disposal Box ix. Urinary catheter (2 sizes) and anaesthetic gel x. Basic delivery kit xi. Bag-valve masks (masks 2 sizes: 1 for adults, 1 for children) xii. Thermometer - non mercury xiii. Forceps xiv. Intubation set	1. (MS: 1; INDUS:4; INDIV: 0 The following should be included in the EMKs: (...) xviii. Automated external defibrillator. Clarify: An automated external defibrillator should be carried in all flights. ECA wonders whether this applies to all kind of operations, irrespective of the size of the aircraft. While such devices may be lifesaving and many airlines choose to carry them, there is insufficient evidence of benefit to justify their inclusion in a regulatory document. The carriage of an AED is not an ICAO requirement. Justification: The regulatory requirement should be limited to those items of medical equipment for which there is clear evidence of benefit in airline operations. The UK's Aviation Health Unit does not support the mandatory carriage of AEDs. http://www.caa.co.uk/default.aspx?catid=923&pagetype=70&gid=924&faqid=929 Though in some individual cases AED use has resulted in succesful resuscitation (3 cases in 10 years at Virgin Atlantic),	1. The automated external defibrillator is a clear safety issue: It prevents diversions because it can be used as a monitoring device and a physician can determine whether the symptoms of a passenger-patient call for a diversion. As a second advantage it can save lives. Discussions on defis are endless and continued over the years although the reviewing team are not aware of even one "classic" carrier that does not carry them today. To start having defis in the rules: Recommendation: Accept the comment and pick up the issue again once Part OPS is revised. See paragraph e.

A: Rule	B: Summary of comments	C: Reason for change, remarks
xv. Aspirator xvi. Blood glucose testing equipment xvii. Scalpel xviii. Automated external defibrillator.	this is a complex issue and more scientific research needs to be done before AEDs are made compulsory. Proposed text: Remove xviii. Automated External Defibrillator and allow airlines to amke their own decisionProposed text: Delete paragraph 2.a.xviii Amend the text to: "The carriage of AEDs should be determined by operators on the basis of a risk assessment taking into account the particular needs of the operation."	
	2. (MS: 0; INDUS:3; INDIV: 0): Paragraph 2.a.xiv states a requirement for an intubation set to be included in the emergency medical kit. This is not an ICAO requirement and in our view should not be included in the list. Airlines which choose to include such equipment in their kit are of course able to do so. Justification: On the advice of international experts on resuscitation, we believe that the risks associated with attempts at intubation in the unsuitable environment of an aircraft (confined space, inadequate lighting, noise and vibration, etc) far outweigh the potential benefits. The resuscitation Council (UK) Edition 5 states "Tracheal intubations should be used only when trained personnel are available to carry out the procedure with a high level of skill and confidence" (http://www.resus.org.uk/pages/als.pdf page 52). The aircraft environment is not suitable due to the confined space, lack of appropriate lighting and noise and poses a potential risk to health (by delaying ventilation) in unskilled hands. A laryngoscope requires a battery and therefore may not be a reliable tool to use which will require a wide variety of blades appropriate from infants to elderly. To prevent delayed oxygenation would suggest that a mask, oropharyngeal or nasopharyngeal airways are sufficient. Proposed text: Delete paragraph 2.a.xiv.	2. Not accepted. An intubation set is essential for recussitation. It is correct that it can only be used by experienced doctors or, in some countries, by specially trained nurses, but nobody who is not experienced or current with intubation would try to use the equipment in the aircraft environment. Note that ICAO does not require an intubation set. However:
	3. (MS: 1; INDUS: 1; INDIV: 0): Paragraph 2.a.xvi states a requirement for blood glucose testing equipment. While airlines may choose to include such equipment, it is a not an essential requirement and should not be included in a	3. Not accepted. Diabetes is a very common disease and acute complications such as hypoglycaemia or, with less frequency hyperglycaemia, happen on board. If the

A: Rule	B: Summary of comments	C: Reason for change, remarks
	regulatory document. In those situations where hypoglycaemia is suspected, a therapeutic trial of oral or, if necessary, intravenous glucose can be given without the need for testing of blood glucose. Hyperglycaemia cannot be treated onboard a commercial aircraft. Justification: the regulatory requirements for an emergency medical kit should be limited to those items which can be justified as essential. Proposed text: Delete paragraph 2.a.xvi	blood glucose level can be measured both conditions can be treated in the aircraft. The measuring equipment is easy to handle and should be on board. ICAO sets standards for the world and there are Third World countries where the possibility to measuere blood glucose is not as easily available as in Europe, but EASA has the mission to protect European passengers. This should not depend on whether or not specific tests or medication is difficult to access in Africa.
	4. (MS: 0; INDUS:2; INDIV: 0): Section 2.a.ix states a requirement for urinary catheter (2 sizes) and anaesthetic gel. Justification: Stipulating that 2 sizes of urinary catheter should be carried is inappropriate as with the advent of new products airlines have the option to include urinary catheters or intermittent urinary catheter which are one size and can be used for both sexes. Proposed text: One or more urinary catheter(s), appropriate for either sex, and anaesthetic gel.	4. Accepted. Agreed that there are urinary catheters for either sex. ICAO does not ask for several sizes.
	5. (MS: 0; INDUS: 2; INDIV: 0): Section 2.a.xi states a requirement for bag valve masks (masks 2 sizes: 1 for adult, 1 for children) Justification: resuscitation pocket masks (RPMs) have been successfully used on adults and children, are widely available and their use taught to crew universally. Effective BVM ventilation requires a level of skill and is better performed as a 2 person technique – in a confined space this is not practicable. Use of the RPM with overhead CPR is a recognised technique. Proposed text: xi. Resuscitation pocket masks with oxygen inlet or BVM.	5. We are talking about two completely different devices. The pocket mask could be used by cabin crew if trained to use it and should, in my opinion, be in the first-aid kit. The bag valve mask can only be used by a professional (physician or, sometimes, nurse). Recommendation: Reject. Reason: The device is needed after intubation and can also be used without intubation by qualified individuals. The device is also mentioned in ICAO.
	6. (MS: 1; INDUS: 0; INDIV: 0): For security reasons, items such as scissors should be stored securely. Comment: This subparagraph is a copy from AMC2 OPS.GEN.455 First-aid kits. In the FAK the only item to be considered for secure storage	6. Self-explanatory. Recommendation: Accept.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	are the scissors. In the EMK scalpels have been added to the items list and should also be included in the requirement for secure storage, as was proposed in JAA NPA-OPS 51. Proposal: e. For security reasons, items such as scissors and scalpels should be stored securely.	
	7. (MS: 1; INDUS: 0; INDIV: 0): (a) Aeroplanes with an MPSC of more than 30 shall be equipped with an emergency medical kit when any point on the planned route is more than 60 minutes flying time (at normal cruising speed) from an aerodrome at which qualified medical assistance is expected to be available. Comment: An AED should be on board all aeroplanes with an MPSC of more than 30 in CAT operations irrespective of the flying time.	7. Not accepted. The issue should be discussed with authorities and industry in a new rulemaking task.
b. Instructions: The instructions should contain a list of contents (medications in trade names and generic names) in at least 2 languages. This should include information on the effects and side effects of medications carried. Basic instructions for use of the medications in the kit. ACLS Cards (summarising and depicting the current algorithm for Advanced Cardiac Life Support).	1. (MS: 0; INDUS: 1; INDIV: 0): Section 2.b states ACLS Cards (summarising and depicting the current algorithm for advanced cardiac life support) yet the current routine medications are not listed in section c. Medications. Justification: ACLS instructions are inappropriate for on board use. They also include some drugs which are not mandatory for carriage on board and are also inappropriate without ability to monitor and analyse rhythms. Proposed text Remove "ACLS cards" and (if anything) replace with "instruction in basic life support".	1. If there is a medical emergency nobody has the time to study either a card or instructions. However, the ACLS card is regularly updated and has international recognition. No reason to change.
c. Medications: i. Coronary vasodilator ii. Anti-spasmodic iii. Epinephrine/Adrenaline 1: 1 000 iv. Adrenocortical steroid v. Major analgesic vi. Diuretic e.g. furosemide vii. Antihistamine, oral and injectable form viii. Sedative/anticonvulsant, injectable rectal and oral forms of sedative ix. Medication for hypoglycaemia e.g. hypertonic glucose x. Antiemetic	1. (MS: 0; INDUS:2; INDIV: 0): a. Paragraph 2.c.xii states a requirement for a bronchial dilator in injectable and inhaled form. The requirement for both forms cannot be justified - generally the inhaled form is appropriate for airline use. Justification: There is little medical requirement for an injectable bronchial dilator and a regulatory requirement to carry both injectable and inhaled forms in an airline extended medical kit cannot be justified. Proposed text: Amend paragraph 2.c.xii to read, "Bronchial dilator - injectable or inhaled form b. Airlines should be required to carry a bronchial dilator, the preparation to be their choice based on local	1. Not accepted. Asthma is a very common disease and an asthma attack during flight is a life threatening event. The time needed for a diversion may be too long to save the passenger. The security laws lead to passengers not taking liquids or medication through the security control so that they are defenseless should an asthma attack happen. The bronchial dilator (inhaled form) should be accessible to a passenger in distress even if there is no doctor or nurse on board. The addition asked for is not necessary. A passenger who needs a bronchial dilator (inhaled form only) can get it from cabin crew. Cabin crew should be trained to hand it out. In this case, the medication could be taken out of

A: Rule	B: Summary of comments	C: Reason for change, remarks
xi. Atropine xii. Bronchial dilator – injectable and inhaled form xiii. IV fluids, in appropriate quantity xiv. Acetylsalicyl Acid (Aspirine) 300 mg in oral and / or injectable form xv. Antiarrythmic xvi. Antihypertensive medication xvii. Injectable antibiotic	emergency treatment guidelines. The suggestion to carry injectable and inhaled products is not warranted. Following evaluation of in-flight data the preference of inhaled products would be nebules and not an inhaler. An inhaler is available for use by one person only, carrying multiples of the small lightweight nebules for inhalation is more appropriate as aircraft have return sectors and it is the treatment of choice for bronchospasm. Proposed text: Amend paragraph 2.c.xii to read, "Bronchial dilator – injectable, inhaled or inhalation preparation.	the first-aid kit.
	2. (MS: 0; INDUS:2; INDIV: 0): Paragraph 2.c.xv states a requirement to carry antiarrythmic medication. Such medication should not normally be used without adequate monitoring equipment which would not routinely be available on a commercial aircraft. Justification: The regulatory requirement for medication to be included in an airline medical kit should be confined to that which can safely be used in an emergency medical event on board a commercial aircraft in flight. This group of medications should only be administered by appropriately qualified staff in a clinical environment that has adequate monitoring. The aircraft environment does not fulfil this. In addition the term "Antiarrythmic" is too generic and vague to be a useful instruction Justification: It is unsafe to administer antiarrhythmic medication where medical history is relatively unknown in inappropriate surroundings, without the required support by appropriately medically qualified support. Proposed text: Delete paragraph 2.c.xv.	2. Antiarrythmic medication should not be carried if there is no way to monitor the effect. Automated external defibrillators have a mode to monitor the ECG. No defibrillator - no antiarrhythmic medication. Recommendation: If automated external defibrillators are carried antiarrythmic medication should be available.
	3. (MS: 0; INDUS: 1; INDIV: 0): Paragraph 2.c.xvi states a requirement for antihypertensive medication. Acute and life-threatening hypertension is rare and its safe and effective management requires the use of medical monitoring equipment which would not be available on a commercial air-	3. Not accepted. If a carrier does not want to take specific antihypertensive medication: A coronary vasodilator, e.g. nitroglycerine, acts as antihypertensive medication as well.

A: Rule	B: Summary of comments	C: Reason for change, remarks
	craft. Treatment for hypertension which is not life-threatening should not be necessary on an aircraft. Justification: The regulatory requirement for medication to be included in an airline medical kit should be confined to that which is required and can safely be used in an emergency medical event on board a commercial aircraft in flight. Proposed text: Delete paragraph 2.c.vi.	
	4. (MS: 0; INDUS: 2; INDIV: 0): Section 2.c.viii states the requirement for sedative/anticonvulsant, injectable, rectal and oral forms of sedative. The requirement to carry 3 preparations of one medication is on past in-flight data unnecessary. Justification: It is reasonable to carry sedative/consultants for rectal use and for emergency IV/IM use. Oral use of medication is the slowest route of absorption therefore unnecessary. If being used to treat severe muscular or joint discomfort a NSAID such as Diclofenac Sodium IM is more appropriate according to current research. Proposed text: Sedative/ anticonvulsant rectal, injectable or oral. [to allow the carrier to decide].	4. Not accepted. Injectable and rectal forms are needed. The "or" would lead to carry only an oral form (cheapest from) and that is useless in the case of a seizure.
	5. (MS: 1; INDUS: 1; INDIV: 0): Comment 1) The list of medications should be more generic in description. 2) Some errors should be rectified. 3) Dosages MUST NOT be included 4) Proposal does not match the ICAO SARPS in Annexe 6, Chapter 6 that will be applicable from November 2009. Specific comments: The carriage of both inhaled and injectable forms of bronchial dilator is unnecessary. Anti-arrhythmic medication cannot be safely used without cardiac monitoring which may not be available. Treatment of hypertension is not appropriate on an aircraft. Justification 1) The name of medications may vary from State to State. 2) Dangerous practice, for example acetylsalicyl acid MUST NOT be injected. 3) Dose will vary according to individual and condition requiring treatment. 4) The proposal will be sub-ICAO from November 2009 unless amended. Proposed Text (if applicable) Amend AMC.OPS.CAT.457. 2. c. to: i. Coronary vasodilator ii. Antispasmodic iii. Epinephrine/Adrenaline 1: 1000 iv. Epinephrine/Adrenaline 1: 10000 (if a car-	5. Proposed text partially accepted.

<table>
<tr><th>A: Rule</th><th>B: Summary of comments</th><th>C: Reason for change, remarks</th></tr>
<tr><td></td><td>diac monitor is available) v. Adrenocorticosteroid – injectable vi. Major analgesic vii. Diuretic – injectable viii. Antihistamine – oral and injectable form ix. Anticonvulsant – injectable and rectal form x. Sedative – injectable, rectal and oral form xi. Medication for hypoglycaemia including dextrose 50% (or equivalent) – injectable 50ml, intramuscular/subcutaneous and oral form xii. Antiemetic – injectable xiii. Atropine – injectable xiv. Bronchial dilator – injectable or inhaled form xv. Acetylsalicylic acid – oral xvi. Glyceryl trinitrate – oral xvii. Beta-blocker – oral xviii. Medication for post-partum bleedig xix. Sodium chloride 0.9% (minimum 250ml) Note: Epinephrine/Adrenaline 1: 10 000 can be a dilution of epinephrine 1: 1 000).</td><td><table>
<tr><td>Changes proposed by CAA UK are shown on the basis of the full list of medication in the NPA)</td><td></td></tr>
<tr><td>Coronary vasodilator</td><td>no comment</td></tr>
<tr><td>~~Anti-spasmodic~~ Antispasmodic</td><td>Recommendation: Correct spelling</td></tr>
<tr><td>Epinephrine/Adrenalin 1:1000</td><td>no comment</td></tr>
<tr><td>Epinephrine/Adrenalin 1:10000 (if a cardiac monitor is available)</td><td>Recommendation: Accept as a Note only as in ICAO</td></tr>
<tr><td>Adrenocorticoid - "injectable"</td><td>Recommendation: Accept. Oral form needs too long to take effect</td></tr>
<tr><td>Major analgesic</td><td>no comment</td></tr>
<tr><td>Diuretic ~~e.g. furosemid-~~ injectable</td><td>Recommendation: Accept. If a quick reaction is needed only the injectable form will work fast enough. Also matches the ICAO provisions.</td></tr>
<tr><td>Antihistamine, oral and injectable form</td><td>no comment</td></tr>
<tr><td>~~Sedative/a~~Anticonvulsant~~,~~ - injectable and rectal ~~and oral~~ form~~s of sedative~~</td><td>Recommendation: Reject. I do not understand the reason for the comment.</td></tr>
</table></td></tr>
<tr><td>d. An automated external defibrillator should be carried on the aircraft however, not necessarily in the emergency medical kit.</td><td>1. (MS: 0; INDUS: 1; INDIV: 0):

Paragraph 2.d reiterates a requirement to carry an automated external defibrillator on board the aircraft. While such devices may be lifesaving and many airlines choose to carry them, there is insufficient evidence of benefit to justify their inclusion in a regulatory document. The carriage of an AED is not an ICAO requirement. Justification: The regulatory requirement should be limited to those items of medical equipment for which there is clear evidence of benefit in airline operations. Proposed text: Delete paragraph 2.d.</td><td>1.

See 2.a Comment 1.</td></tr>
<tr><td>e. For security reasons, items such as scissors should be stored securely.</td><td></td><td></td></tr>
<tr><td>AMC OPS.CAT.457.A(b) Emergency medical kit – Aeroplanes</td><td></td><td></td></tr>
<tr><td>QUALIFIED PERSONNEL</td><td></td><td></td></tr>
<tr><td>Qualified personnel means doctors, nurses or personnel with similar qualification.</td><td>1. (MS: 0; INDUS: 1; INDIV: 0):</td><td>1.&2.</td></tr>
</table>

A: Rule	B: Summary of comments	C: Reason for change, remarks
	This paragraph defines 'qualified personnel' (who may administer drugs from the emergency medical kit) as doctors, nurses or personnel with similar qualifications. Many airlines train some or all cabin crew to administer medication, some of which may be held in the extended medical kit, in specified situations and circumstances. Justification: The text as currently written would limit the use of medication from the extended medical kit to those with some form of formal qualification. There is accumulated evidence over many years that cabin crew can safely administer medication provided they have adequate training and information. This capability offers significant safety (health) benefits in a situation where qualified personnel may not be available. Proposed text: Amend text to read "Qualified personnel means health professionals acting within the limits of their training and expertise or cabin crew who have received training in administration of specified medication from the extended medical kit. 2. (MS: 0; INDUS:7; INDIV: 0): Qualified personnel means doctors, nurses or personnel with similar qualifications. Comment: This is a new requirement which has no justification. Cabin crew should not have similar qualifications as doctors or nurses Proposal: Add 'cabin crew; to the list of qualified personnel'.	AMC deleted in line with CAT.IDE.A.305 (b) proposed updates.
AMC OPS.CAT.457.A(c)(2) Emergency medical kit – Aeroplanes		
CARRYING UNDER SECURITY CONDITIONS		
Where applicable the emergency medical kit should be carried on the flight deck.	1. (MS: 0; INDUS: 10; INDIV: 0): "..... carried on the flight deck" Comment: The flight deck is not an appropriate place to store the EMK, which will result in delays in gaining access to it. Furthermore it may result in a security risk with potential terrorists using ill health as a means of getting the cockpit door open. Justification: Suggest allowing the EMK to be securely stowed in the main cabin as there is nil delay gaining access in a medical emergency and reduces the potential security risk in accessing the flight deck. Proposed text: Amend to read: "It is the airlines responsibility to determine the most appropriate stowage for the EMK whereby it is	1. Changed to "Where posible".

A: Rule	B: Summary of comments	C: Reason for change, remarks
	stowed securely yet readily accessible in an emergency medical situation. a. Amend to: 'The operator should determine where to store the EMK, taking accessibility and security issues into account'. b. Proposal: Stick to EU-OPS "Where applicable practicable the emergency medical kit should be carried on the flight deck".	
AMC OPS.CAT.457.A(c)(3) Emergency medical kit – Aeroplanes		
MAINTENANCE OF EMERGENCY MEDICAL KIT		
In order to maintain the emergency medical kit the operator should ensure that the emergency medical kits are:		
1. Inspected periodically to confirm, to the extent possible, that the contents are maintained in the condition necessary for their intended use; and		
2. Replenished at regular intervals, in accordance with instructions contained on their labels, or as circumstances warrant.		
AMC1 OPS.CAT.490.A Flight data recorder – Motor powered aircraft		
LIST OF PARAMETERS TO BE RECORDED FOR AEROPLANES FIRST ISSUED WITH AN INDIVIDUAL CERTIFICATE OF AIRWORTHINESS ON OR AFTER 1 JANUARY 2010		
The flight data recorder should record with reference to a timescale, the list of parameters in Table 1 AMC1 OPS.GEN.490.A and Table 2 AMC1 OPS.GEN.490.A, as applicable.		
AMC2 OPS.CAT.490.A Flight data recorder– Motor powered aircraft		
LIST OF PARAMETERS TO BE RECORDED FOR AEROPLANES FIRST ISSUED WITH AN INDIVIDUAL CERTIFICATE OF AIRWORTHINESS ON OR AFTER 1 APRIL 1998	See comment on AMC1 OPS.CAT.490.A	See comment on AMC1 OPS.CAT.490.A
1. The flight data recorder should record, with reference to a timescale: a. the parameters listed in Table 1a AMC2 OPS.CAT.490.A or Table 1b AMC2 OPS.CAT.490.A below, as applicable; b. the additional parameters listed in Table 2 AMC2 OPS.CAT.490.A below, for those aeroplanes with a maximum certificated take-off exceeding 27 000 kg; c. any dedicated parameters relating to novel or unique design or operational characteristics of the aeroplane as determined by the competent authority responsible for type or supplemental type certification; and d. the additional parameter listed in Table 3 AMC2 OPS.CAT.490.A below, for	1. (MS: 1; INDUS: 12; INDIV: 0) The "competent authority responsible for type certification or supplemental type certification". This wording is different from EU-OPS. Moreover, the authority responsible for type certification or supplemental type certification would be EASA whereas EU-OPS refers to "the competent authority" (NAA).	1. The Agency is responsible for the approval of novel and unique designs, and also for the approval of dedicated parameters (explanation of Avionics systems section). Note: The competent authority mentioned in NPA OPS.GEN.001 of NPA-2009-2b relates to the oversight of operations and not to certification. Note: in commission regulation 2042/2003, the com-

A: Rule	B: Summary of comments	C: Reason for change, remarks
those aeroplanes equipped with electronic display system.		petent authority is defined as such in M.1: "1. for the oversight of the continuing airworthiness of individual aircraft and the issue of airworthiness review certificates the authority designated by the Member State of registry. 2. for the oversight of a maintenance organisation as specified in M.A. Subpart F, (i) the authority designated by the Member State where that organisation's principle place of business is located. 4. for the approval of maintenance programmes, (i) the authority designated by the Member State of registry."
2. When determined by the competent authority responsible for type or supplemental type certification and agreed by the Agency, the flight data recorder of aeroplanes first issued with an individual Certificate of Airworthiness before 20 August 2002 and equipped with an electronic display system does not need to record those parameters listed in Table 3 AMC2 A OPS.CAT.490 below for which: a. The sensor is not available; b. The aeroplane system or equipment generating the data needs to be modified; or c. The signals are incompatible with the recording system;	See the comment on AMC2 OPS.CAT.490.A, paragraph 1	See the comment on AMC2 OPS.CAT.490.A, paragraph 1
3. The flight data recorder of aeroplanes first issued with an individual Certificate of Airworthiness on or after 1 April 1998 but not later than 1 April 2001, are not required to comply with 1. above if: a. Compliance with 1.a. cannot be achieved without extensive modification to the aeroplane system and equipment other than the flight recoding system. b. The flight data recorder of the aeroplane can comply with AMC3 A OPS.CAT.490 except that parameter 15b in Table 1 AMC2 A OPS.CAT.490 of this AMC need not to be recorded.		1. Editorial: This paragraph corresponds to EU-OPS 1.715 (g)
4. The operational performance requirements for Flight Data Recorders should be those laid down in EUROCAE Document ED55 (Minimum Operational Performance Specification for Flight Data Recorder Systems) dated May 1990.	1. (MS: 1; INDUS: 0; INDIV: 0) EUROCAE Document ED-55 is obsolete and has been superseded by ED-112.	1. Regulatory justification: Since EUROCAE Document ED-112 supersedes ED-55 and ED56A, there should be no reference to these documents anymore, but instead the relevant requirements should be directly included into the AMC. However, the requirements contained in ED-112 cannot be applied directly to older designs, otherwise it may re-

A: Rule	B: Summary of comments	C: Reason for change, remarks
		quire a recertification of the installation. Note: In ACJ OPS 1.715, this paragraph did not relate to parameters only, but to operational performance requirements of the FDR in general. Requirements on the FDR design with references to EUROCAE documents can be found in ETSO 124a (published) and ETSO 124b (draft ETSO in NPA 2009-11).
5. The parameters to be recorded should meet, as far as practicable, the performance specifications (designated ranges, sampling intervals, accuracy limits and minimum resolution in read-out) defined in the relevant tables of EUROCAE Minimum Operational Performance Specification for Flight Data Recorder Systems, Document ED 55 dated May 1990. The remarks columns of those tables are acceptable means of compliance to the parameter specifications.	1. (MS: 1; INDUS: 0; INDIV: 0) EUROCAE Document ED-55 is obsolete and has been superseded by ED-112.	1. Regulatory justification: EUROCAE ED-55 is an obsolete document which is no longer maintained by EUROCAE and therefore should not be referenced. Therefore ED-55 table A1 (large aeroplanes) needs to be directly introduced in this Appendix. Indeed the requirements contained in ED-112 cannot be applied directly to older designs, otherwise it may require a recertification of the installation.
6. For aeroplanes with novel or unique design or operational characteristics, the additional parameters should be those required by the competent authority responsible for type or supplemental type certification.	1. See the comment on AMC2 OPS.CAT.490.A, paragraph 1	1. Regulatory justification: This paragraph comes from TGL 44, ACJ OPS 1.715. The original wording is less ambiguous than what was proposed in NPA 2009-2b
7. If recording capacity is available, as many of the additional parameters specified in table A1.5 of Document ED 55 dated May 1990 as possible should be recorded.	1. (MS: 1; INDUS: 0; INDIV: 0) EUROCAE Document ED-55 is obsolete and has been superseded by ED-112.	1. Regulatory justification: This paragraph comes from TGL 44, ACJ OPS 1.715. EUROCAE ED-55 is an obsolete document which is no longer maintained by EUROCAE and therefore should not be referenced.
Table 1a AMC2 OPS.CAT.490.A Aeroplanes with a maximum certificated take-off mass exceeding 5 700 kg		
No.* | Parameter 1 | Time or relative time count 2 | Pressure altitude 3 | Indicated airspeed		1. EUROCAE ED-55 is an obsolete document which is no longer maintained by EUROCAE and therefore should not be referenced.

A: Rule	B: Summary of comments	C: Reason for change, remarks
4 Heading 5 Normal acceleration 6 Pitch attitude 7 Roll attitude 8 Manual radio transmission keying 9 Propulsive thrust/ power on each engine and cockpit thrust/power lever position if applicable 10 Trailing edge flap or cockpit control selection 11 Leading edge flap or cockpit control selection 12 Thrust reverse status 13 Ground spoiler position and/or speed brake selection 14 Total or outside air temperature 15 Autopilot, autothrottle and AFCS mode and engagement status 16 Longitudinal acceleration (Body axis) 17 Lateral acceleration * The number in the left hand column reflects the Serial Numbers depicted in EUROCAE document ED55.		
Table 1b AMC2 OPS.CAT.490.A Aeroplanes with a maximum certificated take-off mass of 5 700 kg or below		
No.* Parameter 1 Time or relative time count 2 Pressure altitude 3 Indicated airspeed 4 Heading 5 Normal acceleration		1. EUROCAE ED-55 is an obsolete document which is no longer maintained by EUROCAE and therefore should not be referenced.

A: Rule	B: Summary of comments	C: Reason for change, remarks
6 Pitch attitude 7 Roll attitude 8 Manual radio transmission keying 9 Propulsive thrust/ power on each engine and cockpit thrust/power lever position if applicable 10 Trailing edge flap or cockpit control selection 11 Leading edge flap or cockpit control selection 12 Thrust reverse status 13 Ground spoiler position and/or speed brake selection 14 Total or outside air temperature 15 Autopilot/autothrottle engagement status 16 Angle of attack (if a suitable sensor is available) 17 Longitudinal acceleration (Body axis) * The number in the left hand column reflects the Serial Numbers depicted in EUROCAE document ED55.		
Table 2 AMC2 OPS.CAT.490.A		
Additional parameters for aeroplanes with a maximum certificated take-off mass of over 27 000 kg		
No.* Parameter 18 Primary flight controls - Control surface position and/or pilot input (pitch, roll, yaw) 19 Pitch trim position 20 Radio altitude 21 Vertical beam deviation (ILS Glide path or MLS Elevation) 22 Horizontal beam deviation (ILS Localiser or MLS Azimuth) 23 Marker Beacon Passage		1. EUROCAE ED-55 is an obsolete document which is no longer maintained by EUROCAE and therefore should not be referenced.

<table>
<tr><th>A: Rule</th><th>B: Summary of comments</th><th>C: Reason for change, remarks</th></tr>
<tr><td>
<table>
<tr><td>24</td><td>Warnings</td></tr>
<tr><td>25</td><td>Reserved (Navigation receiver frequency selection is recommended)</td></tr>
<tr><td>26</td><td>Reserved (DME distance is recommended)</td></tr>
<tr><td>27</td><td>Landing gear squat switch status or air/ground status</td></tr>
<tr><td>28</td><td>Ground Proximity Warning System</td></tr>
<tr><td>29</td><td>Angle of attack</td></tr>
<tr><td>30</td><td>Low pressure warning (hydraulic and pneumatic power)</td></tr>
<tr><td>31</td><td>Groundspeed</td></tr>
<tr><td>32</td><td>Landing gear or gear selector position</td></tr>
</table>
* The number in the left hand column reflects the Serial Numbers depicted in EUROCAE document ED55.
</td><td></td><td></td></tr>
<tr><td>Table 3 AMC2 OPS.CAT.490.A</td><td></td><td></td></tr>
<tr><td>Aeroplanes equipped with electronic display systems</td><td></td><td></td></tr>
<tr><td>
<table>
<tr><td>No.</td><td>Parameter</td></tr>
<tr><td>33</td><td>Selected barometric setting (Each pilot station)</td></tr>
<tr><td>34</td><td>Selected altitude</td></tr>
<tr><td>35</td><td>Selected speed</td></tr>
<tr><td>36</td><td>Selected mach</td></tr>
<tr><td>37</td><td>Selected vertical speed</td></tr>
<tr><td>38</td><td>Selected heading</td></tr>
<tr><td>39</td><td>Selected flight path</td></tr>
<tr><td>40</td><td>Selected decision height</td></tr>
<tr><td>41</td><td>EFIS display format</td></tr>
<tr><td>42</td><td>Multi function /Engine / Alerts display format</td></tr>
</table>
* The number in the centre column reflects the Serial Numbers depicted in EUROCAE document ED55
</td><td></td><td>1.
EUROCAE ED-55 is an obsolete document which is no longer maintained by EUROCAE and therefore should not be referenced.</td></tr>
</table>

A: Rule	B: Summary of comments	C: Reason for change, remarks
table A1.5.		
AMC3 OPS.CAT.490.A Flight data recorder– motor powered aircraft	1. (MS: 1; INDUS: 0; INDIV: 0) EUROCAE Document ED-55 is obsolete and has been superseded by ED-112.	1.Regulatory justification: ACJ OPS 1.715 was referencing to EUROCAE ED 55 relevant tables and this AMC corresponds to ACJ OPS 1.715, but EUROCAE ED-55 is an obsolete document which is no longer maintained by EUROCAE and therefore should not be referenced. Hence ED-55 table A1 (large aeroplanes) needs to be directly introduced in this Appendix. Indeed the requirements contained in ED-112 cannot be applied directly to older designs, otherwise it may require a recertification of the installation. Therefore it is proposed to create a new dedicated AMC where ED-55 table A1 will have been imported.
LIST OF PARAMETERS TO BE RECORDED FOR AEROPLANES FIRST ISSUED WITH AN INDIVIDUAL CERTIFICATE OF AIRWORTHINESS ON OR AFTER 1 JUNE 1990 UP TO AND INCLUDING 31 MARCH 1998		
1. The flight data recorder should, with reference to a timescale, record: a. the parameters listed in Table 1 AMC3 OPS.CAT.490.A below; b. the additional parameters listed in Table 2 AMC3 OPS.CAT.490.A below for those aeroplanes with a maximum certificated take-off mass exceeding 27 000 kg.		
2. When determined by the competent authority responsible for type or supplemental type certification and agreed by the Agency, the flight data recorder of aeroplanes having a maximum certificated take-off mass of 27 000 kg or below do not need to record parameters 14 and 15b of Table 1 AMC3 OPS.CAT.490.A below if any of the following conditions are met: a. the sensor is not readily available; b. sufficient capacity is not available in the flight recorder system; and c. a change is required in the equipment that generates the data.		1. Editorial corrections
3. When determined by the competent authority responsible for type or supplemental type certification and agreed by the Agency, the flight data recorder of aeroplanes having a maximum certificated take-off mass exceeding 27 000 kg, does not need to record parameter 15b of Table 1 AMC3 OPS.CAT.490.A below, and parameters 23, 24, 25, 26, 27, 28, 29, 30 and 31 of Table 2 AMC3 OPS.CAT.490.A below, if any of the following conditions are met: a. the sensor is not readily available;	See the comment on AMC2 OPS.CAT.490.A, paragraph 1	See the comment on AMC2 OPS.CAT.490.A, paragraph 1

<table>
<tr><th>A: Rule</th><th>B: Summary of comments</th><th>C: Reason for change, remarks</th></tr>
<tr><td>b. sufficient capacity is not available in the flight data recorder system;
c. a change is required in the equipment that generates the data;
d. for navigational data (NAV frequency selection, DME distance, latitude, longitude, ground speed and drift) the signals are not available in digital form; and
e. when the above conditions have been met and that compliance with this AMC would imply significant modifications to the aeroplane with a severe re-certification effort.</td><td></td><td></td></tr>
<tr><td>4. When determined by the competent authority responsible for type or supplemental type certification and agreed by the Agency, the flight data recorder does not need to record individual parameters that can be derived by calculation from the other recorded parameters.</td><td>See the comment on AMC2 OPS.CAT.490.A, paragraph 1</td><td>See the comment on AMC2 OPS.CAT.490.A, paragraph 1</td></tr>
<tr><td>Table 1 AMC3 OPS.CAT.490.A
Aeroplanes with a maximum certificated take-off mass exceeding 5 700 Kg</td><td>1. (MS: 0; INDUS: 1; INDIV: 0)
The applicable performance specifications for parameters covered by this AMC are missing.</td><td>1.Regulatory justification:
The applicable performance specifications on parameters for this generation of aeroplanes (ICA delivered between 1990-1998) operated under CAT are the same as those contained in table 1 of Appendix 1 to AMC2 OPS.GEN.490.A, which applies to GEN, since the latter table is copied from ACJ OPS 1.720/1.725 in TGL44 (JAR-OPS 1 section2).</td></tr>
<tr><td>
<table>
<tr><td>No</td><td>Parameter</td></tr>
<tr><td>1</td><td>Time or relative time count</td></tr>
<tr><td>2</td><td>Pressure altitude</td></tr>
<tr><td>3</td><td>Indicated Airspeed</td></tr>
<tr><td>4</td><td>Heading</td></tr>
<tr><td>5</td><td>Normal Acceleration</td></tr>
<tr><td>6</td><td>Pitch attitude</td></tr>
<tr><td>7</td><td>Roll attitude</td></tr>
<tr><td>8</td><td>Manual radio transmission keying unless an alternate means to synchronise FDR and CVR recordings is provided</td></tr>
<tr><td>9</td><td>Power on each engine</td></tr>
<tr><td>10</td><td>Trailing edge flap or cockpit control selection</td></tr>
</table>
</td><td></td><td></td></tr>
</table>

A: Rule	B: Summary of comments	C: Reason for change, remarks
11 Leading edge flap or cockpit control selection 12 Thrust reverse position (for turbojet aeroplanes only) 13 Ground spoiler position and/or speed brake selection 14 Outside air temperature or Total Air Temperature 15a Autopilot engagement status 15b Autopilot operating modes, autothrottle and AFCS systems engagement status and operating modes.		
Table 2 AMC3 OPS.CAT.490.A Additional parameters for aeroplanes with a maximum certificated take-off mass exceeding 27000 kg		
No Parameter 16 Longitudinal acceleration 17 Lateral acceleration 18 Primary flight controls - Control surface position and/or pilot input (pitch, roll and yaw) 19 Pitch trim position 20 Radio altitude 21 Glide path deviation 22 Localiser deviation 23 Marker beacon passage 24 Master warning 25 NAV 1 and NAV 2 frequency selection 26 DME 1 and DME 2 distance 27 Landing gear squat switch status 28 Ground proximity warning system 29 Angle of attack		

A: Rule	B: Summary of comments	C: Reason for change, remarks
30 Hydraulics, each system (low pressure) 31 Navigation data 32 Landing gear or gear selector position **AMC4 OPS.CAT.490.A Flight data recorder**		
LIST OF PARAMETERS TO BE RECORDED FOR AEROPLANES FIRST ISSUED WITH AN INDIVIDUAL CERTIFICATE OF AIRWORTHINESS BEFORE 1 JUNE 1990		
1. The flight data recorder should, with reference to a timescale, record:		
a. the parameters listed in Table 1 AMC4 OPS.CAT.490.A below;		
b. the additional parameters 6 to 15b of Table 2 AMC4 OPS.CAT.490.A below, for aeroplanes with a maximum certificated take-off mass exceeding 5 700 kg but not exceeding 27000 kg and first issued with an individual Certificate of Airworthiness on or after 1 January 1989, when the following conditions are met: i. sufficient capacity is available on a flight recorder system; ii. the sensor is readily available; and iii. a change is not required in the equipment that generates the data.		
c. the additional parameters from 6 to 15b of Table 2 AMC4 OPS.CAT.490.A below, for aeroplanes with a maximum certificated take-off mass exceeding 27 000 kg that are of a type first type certificated after 30 September 1969;		
d. the additional parameters listed in Table 2 AMC4 OPS.CAT.490.A below for aeroplanes with a maximum certificated take off mass exceeding 27 000 kg and first issued with an individual Certificate of Airworthiness on or after 1 January 1987, when the following conditions are met: i. sufficient capacity is available on a flight recorder system; ii. the sensor is readily available; and iii. a change is not required in the equipment that generates the data.		
2. When determined by the competent authority responsible for type or supplemental type certification and agreed by the Agency, the flight data recorder of aeroplanes with a maximum certificated take-off mass exceeding 27 000 kg that are of a type first type certificated after 30 September 1969 does not need to record the parameters 13, 14 and 15b in Table 2 AMC4 OPS.CAT.490.A below, when any of the following conditions are met: i. sufficient capacity is available on a flight recorder system;	See the comment on AMC2 OPS.CAT.490.A, paragraph 1	See the comment on AMC2 OPS.CAT.490.A, paragraph 1

<table>
<tr><th>A: Rule</th><th>B: Summary of comments</th><th>C: Reason for change, remarks</th></tr>
<tr><td>ii. the sensor is readily available; and
iii. a change is not required in the equipment that generates the data.</td><td></td><td></td></tr>
<tr><td>3. When so determined by the competent authority responsible for type or supplemental type certification and agreed by the Agency, the flight data recorder does not need to record individual parameters that can be derived by calculation from the other recorded parameters.</td><td>1. (MS: 0; INDUS: 1; INDIV: 0)
The applicable performance specifications for parameters covered by this AMC are missing.</td><td>1.
Regulatory justification:
The applicable performance specifications on parameters for this generation of aeroplanes (ICA delivered before 1990) are the same as those contained in table 1 of Appendix 1 to AMC3 OPS.CAT.490.A, since this table is copied from Appendix 1 to ACJ OPS 1.720 /1.725 in TGL 44.</td></tr>
<tr><td>Table 1 AMC4 OPS.CAT.490.A</td><td>See the comment on AMC2 OPS.CAT.490.A, paragraph 1</td><td>See the comment on AMC2 OPS.CAT.490.A, paragraph 1</td></tr>
<tr><td>Aeroplanes with a maximum certificated take-off mass exceeding 5 700 Kg
<table><tr><td>No.</td><td>Parameter</td></tr><tr><td>1</td><td>Time or relative time count</td></tr><tr><td>2</td><td>Pressure altitude</td></tr><tr><td>3</td><td>Indicated Airspeed</td></tr><tr><td>4</td><td>Heading</td></tr><tr><td>5</td><td>Normal Acceleration</td></tr></table>Table 2 AMC4 OPS.CAT.490.A
Additional parameters for aeroplanes with a maximum certificated take-off mass exceeding 27 000 kg
<table><tr><td>No</td><td>Parameter</td></tr><tr><td>6</td><td>Pitch attitude</td></tr><tr><td>7</td><td>Roll attitude</td></tr><tr><td>8</td><td>Manual radio transmission keying unless an alternate means to synchronise the FDR and CVR recordings is provided</td></tr><tr><td>9</td><td>Power on each engine</td></tr></table></td><td></td><td>1.
Editorial justification
Table 2 not only applies to aeroplanes with an MTOW exceeding 27 000 kg.</td></tr>
</table>

A: Rule		B: Summary of comments	C: Reason for change, remarks
10	Trailing edge flap or cockpit control selection		
11	Leading edge flap or cockpit control selection		
12	Thrust reverse position (for turbojet aeroplanes only)		
13	Ground spoiler position and/or speed brake selection		
14	Outside air temperature or total air temperature		
15a	Autopilot engagement status		
15b	Autopilot operating modes, autothrottle and AFCS, systems engagement status and operating modes.		
16	Longitudinal acceleration		
17	Lateral acceleration		
18	Primary flight controls – Control surface position and/or pilot input (pitch, roll and yaw)		
19	Pitch trim position		
20	Radio altitude		
21	Glide path deviation		
22	Localiser deviation		
23	Marker beacon passage		
24	Master warning		
25	NAV 1 and NAV 2 frequency selection		
26	DME 1 and DME 2 distance		
27	Landing gear squat switch status		
28	Ground proximity warning system		
29	Angle of attack		
30	Hydraulics, each system (low pressure)		
31	Navigation data (latitude, longitude, ground speed and drift angle)		
32	Landing gear or gear selector position		

A: Rule	B: Summary of comments	C: Reason for change, remarks
Appendix 1 to AMC3 CAT.490.A and AMC4 OPS.CAT.490.A Flight data recorder		
PERFORMANCES SPECIFICATIONS FOR THE PARAMETERS TO BE RECORDED FOR AEROPLANES FIRST ISSUED WITH AN INDIVIDUAL CERTIFICATE OF AIRWORTHINESS BEFORE 1 APRIL 1998		
The parameters to be recorded should meet the performance specifications (designated ranges, recording intervals and accuracy limits) defined in Table 1 of Appendix 1 to AMC3 GEN.490.A and AMC4 OPS.GEN.490.A.		
AMC1 OPS.CAT.490.H Flight data recorder		
LIST OF PARAMETERS TO BE RECORDED FOR HELICOPTERS FIRST ISSUED WITH AN INDIVIDUAL CERTIFICATE OF AIRWORTHINESS ON OR AFTER 1 JANUARY 2010		
The flight data recorder should, with reference to a timescale, record the list of parameters in Table 1 AMC1 OPS.GEN.490.H and Table 2 AMC1 OPS.GEN.490.H, as applicable.		
AMC2 OPS.CAT.490.H Flight data recorder		
LIST OF PARAMETERS TO BE RECORDED FOR HELICOPTERS HAVING A MCTOM EXCEEDING 3175 KG AND FIRST ISSUED WITH AN INDIVIDUAL CERTIFICATE OF AIRWORTHINESS AFTER 31 JULY 1999 AND HELICOPTERS HAVING A MCTOM EXCEEDING 7 000 KG OR A MAXIMUM APPROVED PASSENGER SEATING CONFIGURATION OF MORE THAN 9 AND FIRST ISSUED WITH AN INDIVIDUAL CERTIFICATE OF AIRWORTHINESS AFTER 31 DECEMBER 1988	1. (MS: 0; INDUS: 1; INDIV: 0) The date of 01.01.2010 written in JAA NPA-OPS 67 was proposed at the date of definition of this NPA, so in 2006; nevertheless: - it has to be noted that operators will have big difficulties to modify the helicopters in order to retrofit Type IVA FDRs without the help of helicopter manufacturers, - there are important delays for retrofitting Type IVA FDRs on existing aircraft types because of significant technical difficulties to gather the requested data on sub systems (e.g. AFCS, Instrumentation, Navigation).	1. Regulatory justification: It is proposed to postpone the applicability date of this AMC to 2016, in accordance with the applicability date of 2016 that appears in the corresponding IR (type IVA recorders introduced by NPA-OPS 67).
1. The flight data recorder should, with reference to a timescale, record: a. for helicopters with a maximum certificated take-off mass between 3 175 kg and 7 000 kg the parameters listed in Table 1 AMC2 OPS.CAT.490.H below; b. for helicopters with a maximum certificated take-off mass exceeding 7 000 kg, the parameters listed in Table 2 AMC2 OPS.CAT.490.H below; c. any dedicated parameters relating to novel or unique design or operational characteristics of the helicopter; and d. the parameters listed in Table 3 AMC2 OPS.CAT.490.H below, for helicopters		

A: Rule	B: Summary of comments	C: Reason for change, remarks
equipped with electronic display system.		
2. When determined by the competent authority responsible for type or supplemental type certification and agreed by the Agency, the flight data recorder of helicopters with a maximum certificated take-off mass exceeding 7 000 kg does not need to record parameter 19 of Table 2 AMC2 OPS.CAT.490.H below, if any of the following conditions are met: a. The sensor is not available; and b. A change is required in the equipment that generates the data.	1. (MS: 1; INDUS: 12; INDIV: 0) The "competent authority responsible for type certification or supplemental type certification". This wording is different from EU-OPS. Moreover, the authority responsible for type certification or supplemental type certification would be EASA whereas EU-OPS refers to "the competent authority" (NAA).	1. The Agency is responsible for the approval of novel and unique designs, and also for the approval of dedicated parameters (explanation of Avionics systems section). Note: The competent authority mentioned in NPA OPS.GEN.001 of NPA-2009-2b relates to the oversight of operations and not to certification. Note: in Commission Regulation 2042/2003, the competent authority is defined as such in M.1: "1. for the oversight of the continuing airworthiness of individual aircraft and the issue of airworthiness review certificates the authority designated by the Member State of registry. 2. for the oversight of a maintenance organisation as specified in M.A. Subpart F, (i) the authority designated by the Member State where that organisation's principle place of business is located. 4. for the approval of maintenance programmes, (i) the authority designated by the Member State of registry."
3. Individual parameters that can be derived by calculation from the other recorded parameters, need not to be recorded, if agreed by the Agency.		
4. The parameters to be recorded should meet, as far as practicable, the performance specifications (designated ranges, sampling intervals, accuracy limits and minimum resolution in read-out) defined in the relevant tables of EUROCAE Minimum Operational Performance Specification for Flight Data Recorder Systems, Document ED 55 dated May 1990. The remarks columns of those tables are acceptable means of compliance to the parameter specifications.		1. In ACJ OPS 3.712, there is only mention of performance requirements on the FDR parameters, not on the FDR itself. The table 1 in Appendix 1 to ACJ OPS 3.712 is similar to EUROCAE ED112 table II-A.2.
5. Table 1 AMC2 OPS.CAT.490.H refers to EUROCAE document ED-55 Table A1-4, Table 2 AMC2 OPS.CAT.490.H refers to ED-55 Table A1-2 and Table 3 AMC2 OPS.CAT.490.H refers to ED-55 Table A1-5 parameters 6 to 15.		
6. If recording capacity is available, as many of the additional parameters specified in Table A1.5 of Document ED-55 dated May 1990 as possible should be recorded.		

<table>
<tr><th>A: Rule</th><th>B: Summary of comments</th><th>C: Reason for change, remarks</th></tr>
<tr><td>7. For the purpose of this AMC a sensor is considered “readily available” when it is already available or can be easily incorporated.</td><td></td><td></td></tr>
<tr><td>8. The term ‘where practicable’ used in the remarks column of Table A1.5 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;
f. Equipment software development.</td><td></td><td></td></tr>
<tr><td>Table 1 AMC2 OPS.CAT.490.H
Helicopters with a maximum certificated take-off mass of 7 000 kg or less</td><td></td><td>1. Editorial justification: A title was added to this table.
Note: This table contains the parameters not marked with an asterisk in table A of appendix 1 to JAR-OPS 3.712</td></tr>
<tr><td>
<table>
<tr><th>No.</th><th>Parameter</th></tr>
<tr><td>1</td><td>Time or relative time count</td></tr>
<tr><td>2</td><td>Pressure altitude</td></tr>
<tr><td>3</td><td>Indicated airspeed</td></tr>
<tr><td>4</td><td>Heading</td></tr>
<tr><td>5</td><td>Normal acceleration</td></tr>
<tr><td>6</td><td>Pitch attitude</td></tr>
<tr><td>7</td><td>Roll attitude</td></tr>
<tr><td>8</td><td>Manual radio transmission keying</td></tr>
<tr><td>9</td><td>Power on each engine (free power turbine speed and engine torque)/cockpit power control position (if applicable)</td></tr>
<tr><td>10a
10b</td><td>Main rotor speed
Rotor brake (if installed)</td></tr>
<tr><td>11</td><td>Primary flight controls - Pilot input and control output position (if applicable)</td></tr>
</table>
</td><td></td><td></td></tr>
</table>

A: Rule	B: Summary of comments	C: Reason for change, remarks

11a	Collective pitch
11b	Longitudinal cyclic pitch
11c	Lateral cyclic pitch
11d	Tail rotor pedal
11e	Controllable stabilator
11f	Hydraulic selection
12	Warnings
13	Outside air temperature
14	Autopilot engagement status
15	Stability augmentation system engagement

Table 2 AMC2 OPS.CAT.490.H

Helicopters with a maximum certificated take-off mass of exceeding 7 000 kg

No.	Parameter
1	Time or relative time count
2	Pressure altitude
3	Indicated 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	Main rotor speed
10b	Rotor brake (if installed)
11 11a	Primary flight controls - Pilot input and control output position (if applicable)

A: Rule		B: Summary of comments	C: Reason for change, remarks
11b	Collective pitch		
11c	Longitudinal cyclic pitch		
11d	Lateral cyclic pitch		
11e	Tail rotor pedal		
11f	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		
27	Reserved (Nav receiver frequency selection is recommended)		
28	Reserved (DME distance is recommended)		
29	Reserved (navigation data is recommended)		
30	Landing gear or gear selector position		

A: Rule	B: Summary of comments	C: Reason for change, remarks
Table 3 AMC2 OPS.CAT.490.H		
<table><tr><td>No.</td><td>Parameter</td></tr><tr><td>6</td><td>Selected barometric setting (Each pilot station)</td></tr><tr><td>7</td><td>Selected altitude</td></tr><tr><td>8</td><td>Selected speed</td></tr><tr><td>9</td><td>Selected mach</td></tr><tr><td>10</td><td>Selected vertical speed</td></tr><tr><td>11</td><td>Selected heading</td></tr><tr><td>12</td><td>Selected flight path</td></tr><tr><td>13</td><td>Selected decision height</td></tr><tr><td>14</td><td>EFIS display format</td></tr><tr><td>15</td><td>Multi function /Engine / Alerts display format</td></tr></table> **AMC OPS.CAT.515.A Microphones - Aeroplanesgeneral**		
The boom microphone or throat microphones should be worn in a position which permits use for two-way radio communications.		
AMC OPS.CAT.516 Crew member interphone system - Motor powered aircraft		
CHARACTERISTICS		
The crew member interphone system should:		
1. Operate independently of the public address system except for handsets, headsets, microphones, selector switches and signalling devices;		
2. Be operable at required cabin crew member stations close to floor level emergency exits;		
3. Have an alerting system incorporating aural or visual signals for use by flight and cabin crew;		
4. Have a means for the recipient of a call to determine whether it is a normal call or an emergency call as following: a. Lights of different colours;		

A: Rule	B: Summary of comments	C: Reason for change, remarks
b. Codes defined by the operator (e.g. different number of rings for normal and emergency calls); c. Any other indicating signal acceptable to the competent authority responsible for type certification or supplemental type certification;		
5. In the case of aeroplanes, provide two-way communication between: a. the flight crew compartment and each passenger compartment; b. the flight crew compartment and each galley located other than on a passenger deck level; c. the flight crew compartment and each remote crew compartment and crew member station that is not on the passenger deck and is not accessible from a passenger compartment; and d. ground personnel and at least two flight crew members. This interphone system for use by the ground personnel should be, where practicable, so located that the personnel using the system may avoid detection from within the aeroplane;		
6. In the case of helicopters, provide two-way communication between each crew member station;		
7. Be operable from each required flight crew station.		
AMC OPS.CAT.517 Public address system - Motor powered aircraft		
CHARACTERISTICS		
The public address system should:		
1. Operate independently of the interphone systems except for handsets, headsets, microphones, selector switches and signalling devices;		
2. Be readily accessible for immediate use from each required from each required flight crew station;		
3. Have, for each floor level passenger emergency exit which 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;		
4. Be operable within 10 seconds by a cabin crew member at each of those stations;		
5. Be audible at all passenger seats, toilets, cabin crew seats and work stations;		
6. In the case of helicopters, following a total failure of the normal electrical generating system, provide reliable operation for a minimum of 10 minutes.		

A: Rule	B: Summary of comments	C: Reason for change, remarks
AMC OPS.CAT.519.A Internal doors and curtains		
PLACARDS' INDICATION		
Placards on each internal door, or next to a curtain, that is the means of access to a passenger emergency exit, should indicate that it should be secured open during take off and landing.		
AMC1 OPS.CAT.525 Communication and navigation equipment for VFR as controlled flights, night flights and IFR flights – Motor-powered aircraft		
TWO INDEPENDENT COMMUNICATION MEANS		
Whenever two independent means of communication are required, each system should have an independent antenna installation. Whenever rigidly supported non-wire antennae or other antenna installations of equivalent reliability are used, only one antenna may be required.		
AMC2 OPS.CAT.525.A Communication and navigation equipment for VFR as controlled flights, night flights and IFR flights – Motor-powered aircraft		
ACCEPTABLE NUMBER AND TYPE OF COMMUNICATION AND NAVIGATION EQUIPMENT FOR AEROPLANES		
1. Aeroplanes should be equipped with: a. One VOR receiving system, one ADF system, one DME, except that an ADF system need not be installed provided that the use of ADF is not required in any phase of the planned flight; b. One ILS or MLS where ILS or MLS is required for approach navigation purposes; c. One Marker Beacon receiving system where a Marker Beacon is required for approach navigation purposes; d. Area Navigation equipment when area navigation is required for the route being flown (e.g. equipment required by OPS.SPA.001.SPN); e. An additional DME system on any route, or part thereof, where navigation is based only on DME signals; f. An additional VOR receiving system on any route, or part thereof, where navigation is based only on VOR signals; and g. An additional ADF system on any route, or part thereof, where navigation is based only on NDB signals.		
2. An aeroplane may be operated without the navigation equipment specified in 1.e. and1 f. provided it is equipped with alternative equipment. The reliability and the accuracy of alternative equipment should allow safe navigation for the intended		

A: Rule	B: Summary of comments	C: Reason for change, remarks
route.		
3. For short haul operations (operations not crossing the North Atlantics) in the NAT MNPS airspace, an aeroplane may be equipped with only one Long Range Communication System (HF-system) if alternative communication procedures are published for the airspace concerned.		1. This paragraph is moved to IR level
4. An operator should ensure that aeroplanes conducting ETOPS have a communication means capable of communicating with an appropriate ground station at normal and planned contingency altitudes. For ETOPS routes where voice communication facilities are available, voice communications shall be provided. For all ETOPS operations beyond 180 minutes, reliable communication technology, either voice based or data link, should be installed. Where voice communication facilities are not available and where voice communication is not possible or is of poor quality, communications using alternative systems should be ensured.		
5. To perform IFR operations without an ADF system installed, an operator should consider the following guidelines on equipment carriage, operational procedures and training criteria.		
a. The removal/non installation of ADF equipment from an aeroplane may only be done where it is not essential for navigation, and provided that alternative equipment giving equivalent or enhanced navigation capability is carried. This may be accomplished by the carriage of an additional VOR receiver or a GNSS receiver approved for IFR operations.		
b. For IFR operations without ADF, an operator should ensure that: i. route segments that rely solely on ADF for navigation are not flown; ii. a firm commitment is made not to fly any ADF/NDB procedures; iii. that the MEL has been amended to take account of the non-carriage of ADF; iv. that the Operations Manual does not reference any procedures based on NDB signals for the aeroplanes concerned; and v. that flight planning and dispatch procedures are consistent with the above mentioned criteria.		
c. The removal of ADF should be taken into account by the operator in the initial and recurrent training of flight crew.		
6. VHF communication equipment, ILS Localiser and VOR receivers installed on aeroplanes to be operated in IFR should comply with the following FM immunity performance standards: a. ICAO Annex 10 , Volume I - Radio Navigation Aids, and Volume III, Part II -		

A: Rule	B: Summary of comments	C: Reason for change, remarks
Voice Communications Systems. b. 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 RTCA documents DO-186, DO-195 and DO-196.		
AMC2 OPS.CAT.525.H Communication and navigation equipment for VFR as controlled flights, night flights and IFR flights – Motor-powered aircraft		
ACCEPTABLE NUMBER AND TYPE OF COMMUNICATION AND NAVIGATION EQUIPMENT FOR HELICOPTERS		
1. Helicopters should be equipped with: a. Two VOR receiving systems on any route, or part thereof, where navigation is based only on VOR signals; b. Two ADF systems on any route, or part thereof, where navigation is based only on NDB signals. c. Area Navigation equipment when area navigation is required for the route being flown (e.g. equipment required by OPS.SPA.001.SPN)		
2. A helicopter may be operated without the navigation equipment specified in 1.a. and 1.b. above provided it is equipped with alternative equipment. The reliability and the accuracy of alternative equipment should allow safe navigation for the intended route.		
3. VHF communication equipment, ILS Localiser and VOR receivers installed on helicopters to be operated under IFR should comply with the following FM immunity performance standards: a. ICAO Annex 10 , Volume I - Radio Navigation Aids, and Volume III, Part II - Voice Communications Systems. b. 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 RTCA documents DO-186, DO-195 and DO-196.		