

Advisory Circular

GUIDANCE ON INSTRUMENT AND EQUIPMENT REQUIREMENTS IN ANR-135

GENERAL.....	1
PURPOSE	1
APPLICABILITY	1
RELATED REGULATIONS	1
RELATED ADVISORY CIRCULARS	2
CANCELLATION.....	2
EFFECTIVE DATE.....	2
OTHER REFERENCES	2
GUIDANCE 135REG82 GUIDANCE FOR REGULATION 82 OF ANR-135 – GENERAL	3
GUIDANCE 135REG83 GUIDANCE FOR REGULATION 83 OF ANR-135 – INOPERATIVE INSTRUMENTS AND EQUIPMENT	3
GUIDANCE 135REG84 GUIDANCE FOR REGULATION 84 OF ANR-135 – MINIMUM EQUIPMENT LIST.....	4
GUIDANCE 135REG88 GUIDANCE FOR REGULATION 88 OF ANR-135 – SEAT AND RESTRAINTS	5
INFO 135REG95 INFORMATION FOR REGULATION 95 OF ANR-135 – COMMUNICATION EQUIPMENT	6
INFO 135REG96 INFORMATION FOR REGULATION 96 OF ANR-135 – NAVIGATION EQUIPMENT	6
INFO 135REG97 INFORMATION FOR REGULATION 97 OF ANR-135 – SURVEILLANCE EQUIPMENT	6
GUIDANCE 135REG103 GUIDANCE FOR REGULATION 103 OF ANR-135 – MEDICAL AND EMERGENCY EQUIPMENT	6
GUIDANCE 135REG104 GUIDANCE FOR REGULATION 104 OF ANR-135 – REGISTRATION OF ELT	7
GUIDANCE 135REG120 GUIDANCE FOR REGULATION 120 OF ANR-135 – GROUND PROXIMITY WARNING SYSTEM	8

GENERAL

Advisory Circulars (ACs) are issued by the Director-General of Civil Aviation (DGCA) from time to time to provide practical guidance or certainty in respect of the statutory requirements for aviation safety. ACs contain information about standards, practices and procedures acceptable to CAAS. An AC may be used, in accordance with section 3C of the Air Navigation Act (Cap. 6) (ANA), to demonstrate compliance with a statutory requirement. The revision number of the AC is indicated in parenthesis in the suffix of the AC number.

PURPOSE

This AC provides guidance to demonstrate compliance with, and information related to, the instrument and equipment requirements in accordance with ANR-135.

APPLICABILITY

This AC is applicable for the AOC holder operating in accordance with ANR-135.

RELATED REGULATIONS

This AC relates specifically to Division 6 in Part 2 of ANR-135.

RELATED ADVISORY CIRCULARS

- AC 91-6-1 Guidance on Instrument and Equipment requirements in ANR-91 Operations
- AC 91-6-2 Halon Replacement for Fire Extinguishing Agents
- AC 121-6-2 Effectiveness of EGPWS/ TAWS Equipment
- AC 121-6-3 Acceptable Child Restraint System

CANCELLATION

This AC supercedes AC 135-6-1(Rev0). In this Revision 1, guidance to Regulation 116 of ANR-135 was amended to include recommendations for the installation of certain flight recorders.

EFFECTIVE DATE

This AC is effective from 21 December 2018.

OTHER REFERENCES

Nil.

GUIDANCE 135REG82**GUIDANCE FOR REGULATION 82 OF ANR-135 – GENERAL**

- 1 Regulation 82(2) and the Second Schedule identify a list of equipment and instrument that do not need to be approved by the DGCA. It should be noted that some items are not considered equipment nor instrument and do not need to be approved by the DGCA. The following items that are listed in ANR-135 (in the Third Schedule) therefore need not be included in Second Schedule:
 - (a) Glucose toffee tablets; and
 - (b) Fresh water.

GUIDANCE 135REG83**GUIDANCE FOR REGULATION 83 OF ANR-135 –
INOPERATIVE INSTRUMENTS AND EQUIPMENT**

- 1 In seeking the DGCA permission under Regulation 83(1), the AOC holder should provide the DGCA with the following:
 - (a) The circumstances under which the aircraft without the required instruments or equipment, or with any required instrument or equipment inoperative, would need to proceed;
 - (b) The mitigating actions taken to assure the flight may be conducted safely;
 - (c) The safety assessment, particularly in the areas of flight operations and airworthiness, performed by competent personnel;
 - (d) Assurance that coordination with all relevant personnel or departments for the safe management of the affected flight is completed.
- 2 The DGCA may consider authorising the AOC holder to dispatch an aircraft without the required instruments or equipment, or with any required instrument or equipment inoperative. The authorisation would be subject to specific limitations depending on the complexity of the aircraft involved, the technical and operational support which can be provided, the establishment of procedures to ensure such dispatches can be carried out safely. As required by Regulation 83, such authorisation shall be incorporated in the MEL.
- 3 In relation to Regulation 83(5), the AOC holder may seek the DGCA's approval to allow operations to continue with one or more inoperative emergency exit on a certain type of aircraft. The AOC holder should conduct a risk assessment and satisfy the DGCA that an acceptable level of safety is maintained. The risk assessment should take into account,
 - (a) The total number of exits available;
 - (b) The total number of passengers;
 - (c) The capacity of remaining life rafts (after discounting the life rafts associated with the proposed number of inoperative exits)

- 4 In relation to Regulation 83(5)(b)(v), the acceptable means of marking include:
- (a) A conspicuous barrier strap or rope across the inoperative exit; and
 - (b) A red circular placard of at least 23 cm in diameter with a horizontal white bar across it bearing the words "No Exit" in red letter.

GUIDANCE 135REG84 GUIDANCE FOR REGULATION 84 OF ANR-135 – MINIMUM EQUIPMENT LIST

- 1 This Guidance provides advice for the AOC holder in preparing the Minimum Equipment Lists (MEL) for the DGCA's approval. The MEL will specify the conditions under which an aircraft may be authorised to continue in service with certain parts, components, equipment and systems inoperative or unserviceable, or with minor damage to, or missing airframe or engine parts of secondary importance.
- 2 The MEL should contain:
- (a) A general preamble which states:
 - (i) The AOC holder's basic policies regarding operation of an aircraft, components or equipment.
 - (ii) The pilot-in-command's responsibilities to report such defects or damage, and the aspects to be considered by him in deciding whether to continue a flight without rectification.
 - (iii) The responsibilities of engineering staff regarding the deferment of rectification action and their notification and advice to the pilot-in-command.
 - (iv) The certifications required for the deferment of rectification action and notification within the company that a deferment has been authorised.
 - (b) A list of the items that may be unserviceable for a flight to commence. The following should be included for each item:
 - (i) The quantity installed per aircraft and the quantity and location of the items required to be serviceable in specific circumstances.
 - (ii) The limits and conditions applicable in deferring the rectification of the defect together with the notification and advice to flight crews of deferrals.
 - (iii) Any inspection or assessment required before the deferment of defect rectification may be authorised.
 - (iv) The allowable periods within which the defect must be rectified.

- (v) Any limitations imposed on the operation of an aircraft with:
 - (1) other unserviceable or inoperative, components, equipment, parts or systems;
 - (2) missing components or parts; or
 - (3) minor damage.

- 3 The MEL should indicate clearly items which have different dispatch requirements for various special operations, such as EDTO, where applicable in accordance with ANR-98.

- 4 Any amendment submitted for approval must be accompanied with justification. The following information should be provided when an item is proposed to be included into the MEL, or the amendment to an item in the MEL:
 - (a) The part number and manufacturer's name of the item, except where a complete system is involved.
 - (b) Evidence of prior approval by the State of Design, of a similar proposal e.g. Inclusion of the item in an approved master minimum equipment list or configuration deviation list etc.
 - (c) A statement of the effect an unserviceability will have on the airworthiness and/or the operational status of the aircraft including the various classes of operations in which the aircraft may operate.
 - (d) In respect of amendments, a review of the failure rate of the item and a statement on any action taken by the AOC holder to improve its reliability.
 - (e) A statement that the AOC holder has ensured that his relevant departments, especially flight operations and engineering departments, are ready to implement the proposed inclusion or amendment.

- 5 Operation of an aircraft with either unserviceable or inoperative components or equipment that are not specified in a minimum equipment list, or with damage exceeding that specified in the minimum equipment list may only be authorised under a permission granted by the DGCA in accordance with Regulation 83 of ANR-135 (see GUIDANCE 135REG83).

GUIDANCE 135REG88

GUIDANCE FOR REGULATION 88 OF ANR-135 – SEAT AND RESTRAINTS

- 1 Depending on the design, the lock on an inertia reel device may be sufficient to meet the requirements of Regulation 88(2) regarding safety harness for each flight crew seat.

- 2 The AOC holder may refer to AC 121-6-3 for guidance on an acceptable child restraint device referred to in Regulation 88(3) of ANR-135, and its proper use.

INFO 135REG95**INFORMATION FOR REGULATION 95 OF ANR-135 –
COMMUNICATION EQUIPMENT**

- 1 In relation to Regulation 95(3) of ANR-135, an AOC holder is reminded to obtain an approval from DGCA under Division 12 in Part 2 of ANR-98 before conducting performance-based communication operations. This is in addition to equipping the aircraft as required in Regulation 95(1).

INFO 135REG96**INFORMATION FOR REGULATION 96 OF ANR-135 –
NAVIGATION EQUIPMENT**

- 1 In relation to Regulation 96(2) of ANR-135, an AOC holder is reminded to obtain an approval from DGCA under Division 2 in Part 2 of ANR-98 before conducting specified navigation performance operations. This is in addition to equipping the aircraft as required in Regulation 96(1).
- 2 In relation to Regulation 96(3) of ANR-135, the an AOC holder is reminded to obtain an approval from DGCA under Division 3 in Part 2 of ANR-98 before conducting RVSM operations. This is in addition to equipping the aircraft as required in Regulation 96(1).

INFO 135REG97**INFORMATION FOR REGULATION 97 OF ANR-135 –
SURVEILLANCE EQUIPMENT**

- 1 In relation to Regulation 97(2) of ANR-135, an AOC holder is reminded to obtain an approval from DGCA under Division 12 in Part 2 of ANR-98 before conducting performance-based surveillance operations. This is in addition to equipping the aircraft as required in Regulation 97(1).

GUIDANCE 135REG103**GUIDANCE FOR REGULATION 103 OF ANR-135 – MEDICAL
AND EMERGENCY EQUIPMENT**

- 1 The following lists provide details of the contents of first-aid, universal precaution and medical kits, referred to in Regulation 103 of ANR-135.
 - 1.1 First-aid kit
 - (a) list of contents of the first aid kit;
 - (b) antiseptic swabs (10/pack);
 - (c) bandage with adhesive strips;
 - (d) bandage gauze measuring 7.5 cm by 4.5 m;
 - (e) triangular bandage with safety pins;
 - (f) dressing for burns measuring 10 cm by 10 cm;
 - (g) sterile dressing for compress measuring 7.5 cm by 12 cm;
 - (h) sterile dressing gauze measuring 10.4 cm by 10.4 cm;
 - (i) adhesive tape measuring 2.5 cm in a roll;
 - (j) sterile strips (or equivalent adhesive strip);
 - (k) hand cleanser or cleansing towelettes;
 - (l) pad, shield or tape for the eye;
 - (m) a pair of scissors measuring 10 cm;
 - (n) adhesive surgical tape measuring 1.2 cm by 4.6 m;

- (o) splinter tweezers;
- (p) multiple pairs of disposable gloves;
- (q) non-mercury thermometers;
- (r) mouth to mouth resuscitation mask with one-way valve;
- (s) mild to moderate analgesic;
- (t) antiemetic;
- (u) nasal decongestant;
- (v) antacid;
- (w) antihistamine;
- (x) incident record form; and
- (y) a current edition of a first-aid manual.

1.2 Universal protect kit

- (a) dry powder that can convert small liquid spill into a sterile granulated gel;
- (b) germicidal disinfectant for surface cleaning;
- (c) skin wipes;
- (d) face/eye mask (separate or combined);
- (e) disposable gloves;
- (f) protective apron;
- (g) large absorbent towel;
- (h) pick-up scoop with scraper;
- (i) bio-hazard disposal waste bag; and
- (j) instructions.

2 For the purpose of Regulation 103(4) of ANR-135, at least one fire extinguisher is to be located –

- on or near the flight deck, readily accessible from the flight crew station;
- near the entrance to each Class A, B, and E cargo compartment accessible to the crew;
- in a galley not in a passenger or crew compartment;
- in a class E, F or baggage compartment that is accessible by a crew while in flight;
- in a crew rest compartment; and
- in any other compartment that a crew member may access to from a galley.

3 In relation to Regulation 103(5) of ANR-135, the AOC holder may refer to the following for guidance on a suitable fire extinguishing agent to replace Halon.

- AC 91-6-2 Halon Replacement for Fire Extinguishing Agents

**GUIDANCE 135REG104 GUIDANCE FOR REGULATION 104 OF ANR-135 –
REGISTRATION OF ELT**

- 1 As required in Regulation 104(4) of ANR-135, the AOC holder should register with the agency responsible for the aircraft register for an ELT, capable of transmitting on 406 MHz, installed on its aircraft. In the case of a Singapore-registered aircraft, the AOC holder will need to register the ELT with CAAS. GUIDANCE 91REG104 in AC 91-6-1 provides advice on the registration.

GUIDANCE 135REG116 GUIDANCE FOR REGULATION 116 OF ANR-135 – FLIGHT RECORDERS

- 1 As a recommendation over the requirement in Regulation 116(1)(e) of ANR-135, the AOC holder may consider providing an aeroplane of MCTOM over 5700kg for which the *individual certificate of airworthiness is first issued* on or after 1 January 2023 with a FDR that records at least the 82 parameters listed in Table 1-1 of the Aviation Specification 2 – Flight Recorders.
- 2 As a recommendation over the requirement in Regulation 116(2)(f) of ANR-135, the AOC holder may consider providing a helicopter of MCTOM over 3175kg for which the individual certificate of airworthiness is first issued on or after 1 January 2023. with a FDR that records at least the first 53 parameters listed in Table 2-1 of the Aviation Specification 2 – Flight Recorders.
- 3 As a recommendation over the requirement in Regulation 116(2)(d) of ANR-135, the AOC holder may consider providing a helicopter of MCTOM not exceeding 2250 kg, for which the individual certificate of airworthiness is first issued on or after 1 January 2018 — one of the following flight data recorders:
 - (i) an FDR that records at least the first 48 parameters specified in Table 2-1 of the Aviation Specifications 2 — Flight Recorders;
 - (ii) a Class C AIR or AIRS that records at least the flight path and speed parameters displayed to the pilot, as defined in the Aviation Specifications 2 — Flight Recorders;
 - (iii) an ADRS that records at least the first 7 parameters specified in Table 2-3 of the Aviation Specifications 2 — Flight Recorders;
- 4 As a recommendation, the AOC holder may consider providing an aeroplane of MCTOM over 5 700 kg, up to and including 27 000 kg, for which the application for type certification is submitted to a Contracting State on or after 1 January 2023 with a crash-protected flight recorder that records –
 - (a) the information displayed to the flight crew from electronic displays; and
 - (b) the operation of switches and selectors by the flight crew,that are specified in the Aviation Specifications 2 — Flight Recorders issued by the Director General of Civil Aviation as matters to be recorded in the flight recorder.

GUIDANCE 135REG120 GUIDANCE FOR REGULATION 120 OF ANR-135 – GROUND PROXIMITY WARNING SYSTEM

- 1 Terrain Awareness and Warning System (TAWS) Class B will provide the parameters required in Regulation 120(2) of ANR-135.
- 2 Terrain Awareness and Warning System (TAWS) Class A will provide the parameters required in Regulation 120(3) of ANR-135.
- 3 The AOC holder should ensure that the ground proximity warning system, if installed, remains effective and may refer to the following for guidance.
 - AC 121-6-2 Effectiveness of EGPWS/TAWS Equipment