

Advisory Circular

GUIDANCE ON INSTRUMENT AND EQUIPMENT REQUIREMENTS IN ANR-121

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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-121.

APPLICABILITY

This AC is applicable to AOC holder who is operating in accordance with ANR-121

RELATED REGULATIONS

This AC relates specifically to Division 6 in Part 2 of ANR-121.

RELATED ADVISORY CIRCULARS

- AC 91-6-1 Guidance on Instrument and Equipment requirements in ANR-91
- 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 Devices

CANCELLATION

This AC supercedes AC 121-6-1 (Rev0). In this Revision 1, guidance for Regulations 117 and 120A of ANR-121 are included as recommendations for the installation of certain flight recorders.

EFFECTIVE DATE

This AC is effective from 21 December 2018.

OTHER REFERENCES

Nil.

GUIDANCE 121REG80**GUIDANCE FOR REGULATION 80 OF ANR-121 – GENERAL**

- 1 Regulation 80(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 listed in ANR-121 (in the Third Schedule) are therefore not required to be included in Second Schedule:
 - (a) Glucose toffee tablets;
 - (b) Fresh water.

GUIDANCE 121REG81**GUIDANCE FOR REGULATION 81 OF ANR-121 –
INOPERATIVE INSTRUMENTS AND EQUIPMENT**

- 1 In seeking the DGCA's permission under Regulation 81(1) of ANR-121, 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 continue the flight;
 - (b) The mitigating actions taken to assure the flight may be conducted safely;
 - (c) The safety assessment relating to 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 nature of the flight, 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 82, such authorisation shall be incorporated in the MEL.
- 3 In relation to Regulation 81(5) of ANR-121, 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 aeroplane. The AOC holder should conduct a risk assessment and justify 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 81(5)(b)(v) ANR-121, 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.

- 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 deferments.
 - (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 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 81 of ANR-121 (see GUIDANCE 121REG81).

GUIDANCE 121REG 87 GUIDANCE FOR REGULATION 87 OF ANR-121– SEATING AND RESTRAINTS

- 1 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-121, and its proper use.

INFO 121REG95 INFORMATION FOR REGULATION 95 OF ANR-121 – COMMUNICATION EQUIPMENT

- 1 In relation to Regulation 95(3) of ANR-121, 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 aeroplane as required in Regulation 94(1).

INFO 121REG96**INFORMATION FOR REGULATION 96 OF ANR-121 –
NAVIGATION EQUIPMENT**

- 1 In relation to Regulation 96(2) of ANR-121, 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 aeroplane as required in Regulation 96(1).
- 2 In relation to Regulation 96(3) of ANR-121, 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 aeroplane as required in Regulation 95(1).

INFO 121REG97**INFORMATION FOR REGULATION 97 OF ANR-121 –
SURVEILLANCE EQUIPMENT**

- 1 In relation to Regulation 97(2) of ANR-121, 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 aeroplane as required in Regulation 97(1).

GUIDANCE 121REG103**GUIDANCE FOR REGULATION 103 OF ANR-121– 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-121.
 - 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 precaution 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.

1.3 Medical kit

1.3.1 Equipment

- (a) list of contents of the medical kit;
- (b) stethoscope;
- (c) sphygmomanometer (electronic preferred);
- (d) 3 different sizes of oropharyngeal airways;
- (e) syringes in the appropriate range of sizes;
- (f) needles in the appropriate range of sizes;
- (g) intravenous catheters in the appropriate range of sizes;
- (h) antiseptic wipes;
- (i) disposable gloves;
- (j) needle disposal box;
- (k) urinary catheter;
- (l) system for delivering intravenous fluids;
- (m) venous tourniquet;
- (n) sponge gauze;
- (o) adhesive tape;
- (p) surgical mask;
- (q) emergency tracheal catheter or a large gauge intravenous cannula;
- (r) umbilical cord clamp;
- (s) non-mercury thermometers;
- (t) basic life support cards;
- (u) bag-valve mask;
- (v) flashlight and batteries.

1.3.2 Medication

- (a) Epinephrine 1:1000;
- (b) Antihistamine – injectable;
- (c) Dextrose 50% (or equivalent) – injectable: 50ml;
- (d) Nitroglycerin tablets, or spray;
- (e) Major analgesic;
- (f) Sedative anticonvulsant – injectable;
- (g) Antiemetic – injectable;
- (h) Bronchial dilator – inhaler;
- (i) Atropine – injectable;
- (j) Adrenocortical steroid – injectable;
- (k) Diuretic – injectable;
- (l) Medication for postpartum bleeding;
- (m) Sodium chloride 0.9% (minimum 250 ml);

- (n) Acetyl salicylic acid (aspirin) for oral use; and
- (o) Oral beta blocker

If a cardiac monitor is available (with or without an AED), epinephrine 1:10000 (can be a dilution of epinephrine 1:1000) should be added to the list of medication.

- 2 For the purpose of Regulation 102(4) of ANR-121, 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 102(5) of ANR-121, 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 121REG103 GUIDANCE FOR REGULATION 103 OF ANR-121–
DANGEROUS GOODS EMERGENCY RESPONSE KIT**

- 1 A typical “Dangerous goods emergency response kit” for use aboard aircraft should contain:
 - (a) Large, good quality polyethylene bags;
 - (b) Bag ties; and
 - (c) Long rubber gloves.

**GUIDANCE 121REG104 GUIDANCE FOR REGULATION 104 OF ANR-121 –
REGISTRATION OF ELT**

- 1 As required in Regulation 104(4) of ANR-121, 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.

**INFO 121REG108 INFO FOR REGULATION 108 OF ANR-121 – UNDERWATER
LOCATING DEVICE**

- 1 Performance requirements for an underwater locating device (ULD) referred to in Regulation 108(5) of ANR-121 are contained in the SAE AS6254, Minimum Performance Standard for Underwater Locating Devices (Acoustic) (Self-Powered), or equivalent documents”.

**GUIDANCE 121REG110 GUIDANCE FOR REGULATION 110 OF ANR-121–
PASSENGER SAFETY CARDS**

- 1 The passenger safety card, required in Regulation 110(2) of ANR-121, supplement the passenger briefing required under Regulation 18 of ANR-121. Information contained in the card should be lodged with the CAAS.
- 2 The card should be designed and produced as an entity separate from any other literature. It should be located so that the seated passenger can readily see and identify it. A distinctive message that it contains safety information should be placed at the top of the card.
- 3 The card should be in colour and pictorial and, contain information that is unambiguous and easily understood by the passengers. Equipment and operating methods should be depicted pictorially, using internationally recognised symbols wherever possible. Any wording should be kept to a minimum.
- 4 The following information should be included in the card:
 - (a) seat belts - instructions for fastening, adjusting and unfastening;
 - (b) useable exit location - routes to exits should be indicated for crash landing and ditching. This includes over wing emergency exits where the emergency escape routes from the cabin, via the wing to the ground should also be clearly depicted;
 - (c) exit operation - for all types of exit fitted. Illustrations should depict the operation of the exit with the direction of the movement of handles clearly indicated;
 - (d) use of evacuation slides - depicting the correct method of use, the manual inflation handle and discarding high heeled shoes;
 - (e) brace positions to be adopted in the event of an emergency landing - for all types of seat orientation and pitch in use of the aircraft;
 - (f) oxygen masks - instructions of locating, donning and adjusting the mask; initiating oxygen flow. Instructions should be given that masks should be fitted to children only after their guardians have fitted their own;
 - (g) life-jackets - removal from stowage, removal from container and inflation. The card must show that, excepting children, the life-jackets must not be inflated within the cabin;
 - (h) life-raft - location, removal, preparation for use; inflation and launching. Launching locations should be indicated;
 - (i) smoking restrictions;
 - (j) seatbacks and trays - upright and stowed for take-off and landing;
 - (k) emergency floor path lighting systems; and
 - (l) Informational guidance on the use of electronic devices, if applicable.

GUIDANCE 121REG117 GUIDANCE FOR REGULATION 117 OF ANR-121 – FLIGHT RECORDERS

- 1 As a recommendation over the requirement in Regulation 117(1)(f) of ANR-121, 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.

GUIDANCE 121REG120A GUIDANCE FOR REGULATION 120A OF ANR-121 – FLIGHT CREW-MACHINE INTERFACE RECORDINGS

- 1 As a recommendation over the requirement in Regulation 120A(1) of ANR-121, 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 121REG122 GUIDANCE FOR REGULATION 122 OF ANR-121 – GROUND PROXIMITY WARNING SYSTEM

- 1 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 TAWS/EGPWS Equipment