Civil Aviation Safety Authority
of Papua New Guinea

Advisory Circular

AC91-32

VERIFICATION OF OPERATIONS-DERIVED EQUIPMENT NOT PART OF THE TYPE CERTIFICATION OF AIRCRAFT

Original

30 November 2024

GENERAL

Civil Aviation Safety Authority Advisory Circulars (AC) contain information about standards, practices and procedures that the Director has found to be an **Acceptable Means of Compliance (AMC)** with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices or procedures are found to be acceptable, they will be added to the appropriate Advisory Circular.

This Advisory Circular also includes **Explanatory Material (EM)** where it has been shown that further explanation is required. Explanatory Material must not be regarded as an acceptable means of compliance.

PURPOSE

This Advisory Circular provides procedures for the verification of operations-derived equipment which are not part of the type certification of the aircraft and provides explanatory material to assist in showing compliance.

RELATED CAR

This AC relates specifically to operations-derived equipment not part of the Type Certification of aircraft in Civil Aviation Rules Part 91 Subpart F, Part 121 Subpart F, Part 125 Subpart F, Part 135 Subpart F and Part 136 Subpart J.

CHANGE NOTICE

This AC is the Original and there is no change notice.

APPROVAL

This AC has been approved for publication by the Director of Civil Aviation.

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1. EM Part 91 Subpart F Instruments and Equipment

1.1 CASA PNG may issue a Certificate of Airworthiness to an aircraft on the Papua New Guinea civil aircraft register, if it is fitted with operations-derived equipment (ODE) not part of the Type Certification of the aircraft, for example:

1. FDR
2. CVR
3. VFR Flights
4. Overwater operations
5. Flight Over designated land areas
6. High Altitude Flights
7. Icing conditions
8. GPWS
9. ELT
10. ACAS /TAWS/TCAS;
11. Other ODEs as prescribed in the PNG Civil Aviation Rules, as applicable to the aircraft operations.

1.2 Prior to issuance of the Certificate of Airworthiness, CASA will inspect each aircraft and verify that operations-derived equipment which are not part of aircraft Type Certification are fitted as required by the Civil Aviation Rules.

1.3 The owner or operator normally submits a C of A Application form CA 21-02 for the Issue of a Certificate of Airworthiness as prescribed in Civil Aviation Rule Part 21 together with records of the aircraft equipment and system installations in accordance with the requirement of Part 91 Subpart F - Instruments and Equipment.

1.4 A CASA Airworthiness Inspector will normally carry out inspections of the aircraft and associated records to verify the installation of operations-derived equipment not part of the aircraft type certification in accordance with the following CASA checklists prescribed for each category:

(1) For Part 121 - Large Transport Aircraft, Use Checklist CA021-121. (see Appendix A)
(2) For Part 125 – Medium Transport Aircraft, Use Checklist CA021-125.(see Appendix B)
(3) For Part 135 – Small Transport Aircraft, Use Checklist CA021-135. (see Appendix C)
(4) For Part 136 – Helicopters, Use Checklist CA021-136. (see Appendix D)

1.5 Specific rule-requirements and procedures provided in this Advisory Circular indicate compliance with ICAO Annex 6 Part I requirements and are used by the CASA Airworthiness Inspector during the C of A Inspection, to guide them when verifying installation of operations-derived equipment (ODE) not part of the type certification of aircraft.

2. List of Acronyms

For the purposes of this AC, the following acronyms apply:

ACAS II – Airborne Collision Avoidance System

CASA PNG -Civil Aviation Safety Authority of Papua New Guinea

CAR – Civil Aviation Rules

C of A – Certificate of Airworthiness (Aircraft)

ELT – Emergency Locator Transmitter [Either be fixed or portable]

ELT (DT) – ELT Distress Tracking (autonomous transmission)

EGPWS – Enhanced Ground Proximity Warning System

GPWS – Ground Proximity Warning System

ODE – Operations-Derived Equipment not part of the aircraft TC

TAWS – Terrain Avoidance Warning System

TCAS – Terrain Collision Avoidance System

TC – Type Certificate (Aircraft)

VFR – Visual Flight Rules

3. Flight Data Recorder (FDR) - ICAO Annex 6 Part I, 6.3

Airworthiness Inspectors should check and verify compliance of all aircraft to PNG Rules: 121.85, 121.371, Part 121 Appendix A.6, 125.77; 125.369; Part 125 Appendix A.4; 135.71; 135.365; Part 135 Appendix A.3; 136.71; 136.515; and Part 136 Appendix A.2 for installation of operations-derived FDR equipment, as applicable, per the below ICAO Annex 6 Part 1, 6.3 standards:

For Large Transport Aircraft operated under CAR Part 121

Rule 121.85(b), (d) - (i) Flight Recorder Requirements states:

(b) A flight crew member shall ensure that—

(1) the **flight data recorder** required by 121.371 is operated continuously from the instant the aeroplane begins the take-off until it has completed the landing; and

(2) all **recorded data** is kept until the aeroplane has been operated for at least **25 hours** after each operating cycle; and

(3) no more than 1 hour of recorded data is erased for the purpose of testing the **flight recorder** or the **flight recorder system**; and

(4) any erasure made in accordance with paragraph (b)(3) is— (i) of the oldest recorded data accumulated at the time of testing; and

(ii) recorded in the appropriate maintenance documentation.

…

(d) The certificate holder shall maintain sufficient documentation concerning **flight data recorder** parameter allocation, conversion equations, periodic calibration and information as appropriate; and

(e) The certificate holder shall ensure that documentation in paragraph (d) is made available to the Director or the Authority responsible for accident investigation.

(f) The certificate holder must ensure that **flight recorders** are deactivated upon completion of flight time following an accident or incident to preserve **flight recorder** records.

(g) The certificate holder must ensure that **flight recorders** must not be reactivated before their disposition as determined by the Director or the Authority responsible for accident investigation.

(h) The certificate holder must ensure that operational checks and evaluations of recordings from the **flight recorder** systems must be conducted to ensure the continued serviceability of the recorders.

(i) The certificate holder must ensure that all aeroplanes of a maximum certified take-off mass of over 15, 000 kg for which the application for type certification is submitted to the Director on or after 1 January 2016, and which are required to be equipped with both a CVR and **FDR**, are equipped with two combination recorders (**FDR**/CVR). One **recorder** shall be located as close to the cockpit as practicable and the other **recorder** located as aft as practicable.

Rule 121.371 Flight Data Recorder Requirements states:

A holder of an air operator certificate must ensure that:

(a) each of the certificate holder's turbine powered aeroplanes is equipped with a **flight data recorder.**

(b) all aeroplanes –

(1) having a maximum take-off mass of over 27000kg for which the individual certificate of airworthiness is issued on or after 01 January 2023 shall be equipped with a **flight data recorder**, which shall record the information displayed to the flight crew from electronic displays, as well as the operation of switches and selectors by the flight crew; and
(2) record a minimum duration of the **flight recordings** required by paragraph (a), of at least for the last 2 hours; and
(3) with the **flight recordings** required by paragraph (b)(1) shall be able to be correlated to the recorded cockpit audio.

(c) all aeroplanes –

(1) having a maximum take-off mass of over 27000kg for which the type acceptance certificate is issued on or after 01 January 2021 and is authorised to carry more than 19 passengers shall be equipped with a means approved by the Director, to recover **flight data recorder** data and to make it available in a timely manner; and

(2) in approving the means to make the **flight data recorder** data available in a timely manner, the Director shall take into account the following:

(i) the capabilities of the operator; and
(ii) the overall capabilities of the aeroplane and its systems as approved by the State of Design; and
(iii) the reliability of the means to recover the appropriate CVR channels and appropriate **FDR data**; and
(iv) specific mitigation measures.

CAR Part 121 Appendix A.6 Flight data recorder Requirements states:

Flight data recorders shall—

(1) meet the requirements of the TSO C124a; and

(2) be fitted with an underwater locating device that meets the requirements of the TSO C121b and shall operate for a minimum of 90 days; and

(3) be of a non- ejectable type and capable of recording and storing 25 hours of data in a digital form; and

(4) record the parameters as detailed in—

(i) Figure 1; and

(ii) as applicable, Table 1 and Table 2 of Appendix A.

(5) not use engraving metal foil, frequency modulation, photographic film or magnetic tape.

CAR Part 121 Appendix A -FDR Parameter requirements are self-explanatory.

PNG Advisory Circular AC 121-7 FDRs, CVRs, ULD, refers.

For Medium Transport Aircraft operated under CAR Part 125

Similar to the write-up above for FDRs in CAR Part 121- Large Transport Aircraft:

Rule 125.77 on Flight Recorder Requirements are self-explanatory.

Rule 125.369 on Flight Data Recorder requirements are self-explanatory.

Rule Part 125 Appendix A.4 FDR Equipment Standards are self-explanatory.

For Small Transport Aircraft operated under CAR Part 135

Similar to the write-up above for FDRs in CAR Part 121- Large Transport Aircraft:

Rule 135.71 Flight Recorder Requirements are self-explanatory.

Rule 135.365 Flight Data Recorder are self-explanatory.

Rule Part 135 Appendix A.3 FDR Equipment Standards are self-explanatory.

PNG Advisory Circular AC 91-14 Light Weight Recorders, refers.

For Helicopters operated under CAR Part 136

Similar to the write-up above for FDRs in CAR Part 121- Large Transport Aircraft:

Rule 136.71 Flight Recorder requirements are self-explanatory.

Rule 136.515 Flight Data Recorder requirements are self-explanatory.

Rule Part 136 Appendix A.2 FDR Equipment Standards are self-explanatory.

PNG Advisory Circular AC 136-2 Installation, Operation and Maintenance of FDRs in Helicopters, refers.

4. Cockpit Voice Recorder (CVR) - ICAO Annex 6 Part I, 6.3

Airworthiness Inspectors should check and verify compliance of all aircraft to PNG Rules: 121.85, 121.369, Part 121 Appendix A.5, 125.77; 125.367; Part 125 Appendix A.3; 135.71; 135.363; Part 135 Appendix A.2; 136.71; 136.513; and Part 136 Appendix A.1 for installation of operations-derived CVR equipment, as applicable, per the below ICAO Annex 6 Part 1, 6.3 standards:

For Large Transport Aircraft operated under CAR Part 121

Rule 121.85(a), (d) - (i) Cockpit Voice Recorder Requirements states:

(a) A flight crew member shall ensure that—

(1) the **cockpit-voice** recorder required by 121.369 is—

(i) operated continuously from the start of the checklist commenced before engine start until the completion of the final checklist at the termination of flight; or

(ii) if a flight manual engine starting procedure precludes compliance with paragraph (i), operated continuously when the aeroplanes electrical power is activated before engine start until the completion of the final checklist at the termination of flight; and

(iii) if the aeroplane is equipped to record the uninterrupted audio signals received from a boom or a mask microphone, the boom microphone is used below 10 000 feet altitude; and

(iv) if an erasure feature is used in the **cockpit-voice recorder**, only information recorded more than 30minutes earlier than the last record is erased or otherwise obliterated.

(b)…

(c) A flight crew member shall ensure that—

(1) the data link recorder required by 121.383 minimum recording duration must be equal to the duration of the **CVR**; and

(2) data link recording must be able to be correlated to the **recorded cockpit audio**.

(d)…

(e)…

(f) The certificate holder must ensure that flight recorders are deactivated upon completion of flight time following an accident or incident to preserve **flight recorder records**.

(g) The certificate holder must ensure that **flight recorders** must not be reactivated before their disposition as determined by the Director or the Authority responsible for accident investigation.

(h) The certificate holder must ensure that operational checks and evaluations of recordings from the **flight recorder systems** must be conducted to ensure the continued serviceability of the recorders.

(i) The certificate holder must ensure that all aeroplanes of a maximum certified take-off mass of over 15, 000 kg for which the application for type certification is submitted to the Director on or after 1 January 2016, and which are required to be equipped with both a **CVR** and FDR, are equipped with two **combination recorders** (FDR/**CVR**). One recorder shall be located as close to the cockpit as practicable and the other recorder located as aft as practicable.

Rule 121.369 Cockpit voice recorder requirements states:

(a) A holder of an air operator certificate must ensure that each of the certificate holder's turbine powered aeroplanes for which the individual certificate of airworthiness is first issued after 01 January 2003 is equipped with a **cockpit voice recorder**.

(b) A holder of an air operator certificate must ensure that all aeroplanes of a maximum certificated take-off mass of over 27000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2018 must be provided with an alternate power source that powers the c**ockpit voice recorder** or the **forward cockpit voice recorder** in the case of combination recorders.

(c) A holder of an air operator certificate must ensure that the **alternate power source** required under paragraph (b) must—

(1) automatically engage and provide ten minutes, plus or minus one minute, of operation whenever aeroplane power to the recorder ceases, either by normal shutdown or by any other loss of power; and

(2) provide power to the **cockpit voice recorder** and its associated **cockpit area microphone** components; and

(3) be located as close as practicable to the alternate power source.

(d) A holder of an air operator certificate must ensure that all aeroplanes of a maximum certificated take-off mass of over 27000kg for which the individual certificate of airworthiness is issued on or after 01 January 2022 is equipped with a **cockpit voice recorder** which shall retain the information recorded during at least the last **25 hours** of its operation.

(e) A holder of an air operator certificate must ensure that all aeroplanes of a maximum certificated take-off mass of over 27000kg for which the individual certificate of airworthiness is issued on or after 01 January 2025 that are required to be equipped with **Cockpit Audio Recording Systems** shall retain the information recorded during at least the last **2 hours** of their operation.

Rule Part 121 Appendix A.5 Cockpit voice recorder requirements states:

Cockpit voice recorders shall—

(1) meet the requirements of the TSO C123a; and

(2) be fitted with an **underwater locating device** that meets the requirements of the TSO C121b that shall operate for a minimum of **90 days**; and

(3) have a minimum capacity of **2 hours continuous recording time** before any erasure; and

(4) not use magnetic tape or wire.

Rule Part 121 Appendix A.5.1 Cockpit audio Recorder states:

Cockpit audio recording systems shall—
(1) not use magnetic tape or wire.

PNG Advisory Circular AC 121-7 FDRs, CVRs, ULDs, etc. refers.

CVR Requirements for Medium Transport Aircraft operated under CAR Part 125

Similar to the write-up above for CVRs in CAR Part 121- Large Transport Aircraft:

Rule 125.77 on Flight Recorder Requirements are self-explanatory.

Rule 125.367 on CVR requirements are self-explanatory.

Rule Part 125 Appendix A.3 CVR Equipment Standards are self-explanatory.

CVR requirements for Small Transport Aircraft operated under CAR Part 135

Similar to the write-up above for FDRs in CAR Part 121- Large Transport Aircraft:

Rule 135.71 Flight Recorder Requirements are self-explanatory.

Rule 135.363 CVR are self-explanatory.

Rule Part 135 Appendix A.2 CVR Equipment Standards are self-explanatory.

PNG Advisory Circular AC 91-14 Light Weight Recorders, refers.

CVR Requirements for Helicopters operated under CAR Part 136

Similar to the write-up above for FDRs in CAR Part 121- Large Transport Aircraft:

Rule 136.71 Flight Recorder requirements are self-explanatory.

Rule 136.513 CVR requirements are self-explanatory.

Rule Part 136 Appendix A.1 CVR Equipment Standards are self-explanatory.

PNG Advisory Circular AC 91-14 Light Weight Recorders, refers.

5. VFR Flights - ICAO Annex 6 Part I, 6.4

Airworthiness Inspectors should check and verify compliance of all aircraft to PNG Rules: 91.509, 91.511, 91.513, 91.515 and 91.517 for operations-derived equipment required for VFR flights and controlled VFR flights, as per the below ICAO Annex 6 Part 1, 6.4 standards:

ICAO Annex 6 Part I, 6.4 states:

All aircraft when operated as VFR flights shall be equipped with:

(1) A magnetic compass (see rule 91.509);
(2) an accurate timepiece indicating the time in hours, minutes and seconds (see rule 91.509);
(3) a sensitive pressure altimeter (see rule 91.509);
(4) an airspeed indicator (see rule 91.509); and
(5) such additional instruments or equipment as may be prescribed by the appropriate authority (see rule 91.509).

ICAO Annex 6 Part 1, 6.4 and 6.9 states:

All aircraft when operated under controlled VFR, IFR or when the aircraft cannot be maintained in the desired attitude without reference to one or more flight instruments shall be equipped with:

(1) a magnetic compass;
(2) an accurate timepiece indicating the time in hours, minutes and seconds;
(3) two sensitive pressure altimeters with counter drum-pointer or equivalent presentation [*Note.— Neither three-pointer nor drum-pointer altimeters satisfy this requirement];*
(4) *an airspeed indicating system with means of preveting malfunctioning due to either condensation or icing;*
(5) a turn and slip indicator;
(6) an attitude indicator (artificial horizon);
(7) a heading indicator (directional gyroscope);
(8) a means of indicating whether the power supply to the gyroscopic instrument is adequate;
(9) a means of indicating in the flight crew compartment the outside air temperature;
(10) a rate-of-climb and descent indicator; and
(11) Such additional instruments or equipment as prescribed by CASA in rule 91.509 and rule 91.511 from time to time.

Note.— The requirements of 5), 6) and 7) 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.

Rule 91.513 VFR Communication states:

Each aircraft operating under VFR shall be equipped with radio communications equipment that meets level 1 or 2 standards specified in Part 91 Appendix A.9 that is capable of providing continuous two-way communications with an appropriate ATS unit.

6. Overwater Operations - ICAO Annex 6 Part I, 6.5

Airworthiness Inspectors should check and verify compliance of all seaplanes, amphibians and landplanes to PNG Rules: 91.515 -VFR Comms/Nav; 91.525; 91.526; and 91.527 for operations-derived equipment required for overwater operations as per the below ICAO Annex 6 Part 1, 6.5 standards:

ICAO Annex 6 Part I, 6.5.1 states for Seaplanes operating flights over water:

All Seaplanes shall be equipped with:

a) one life jacket, or equivalent individual flotation device, for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided;

b) equipment for making the sound signals prescribed in the International Regulations for Preventing Collisions at Sea, where applicable; and

c) one sea anchor (drogue).

ICAO Annex 6 Part I, 6.5.2 states for Landplanes operating flights over water:

All Landplanes when operating over-water flights shall carry the equipment which shall comprise: **one life jacket or equivalent individual flotation device** for each person on board, stowed in a position easily accessible from the seat or berth of the person for whose use it is provided. This is required for:

(a) Landplanes flying over water and at a distance of more than 93 km (50 NM) away from the shore, in the case of landplanes operated in accordance with EDTO operations;

b) Landplanes flying en route over water beyond gliding distance from the shore, in the case of all other landplanes; and

c) Landplanes taking off or landing at an aerodrome where, in the opinion of the State of the Operator, 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.

[Note 1.— "Landplanes" includes amphibians operated as landplanes.

Note 2.— Life jackets accessible from seats or berths located in crew rest compartments are required only if the seats or berths concerned are certified to be occupied during take-off and landing.

Note 3. — Information regarding the acceptable means of compliance with this Standard, particularly in the case of infants, can be found in the Guidance on the Preparation of an Operations Manual *(Doc 10153), Chapter11, Attachment D.*

Note 4: "Seaplanes" includes amphibians operated as seaplanes]

ICAO Annex 6 Part I, 6.5.3 states for All Aircraft operating long-range flights over water:

All aircraft on long-range over-water flights shall:

(1) In addition to the equipment prescribed above in 6.5.1 (Seaplanes) or 6.5.2 (Landplanes), whichever is applicable, the following equipment shall be installed in all aircraft when used over routes on which the aeroplane may be over water and at more than a distance corresponding to 120 minutes at cruising speed or 740 km (400 NM), whichever is the lesser, away from land suitable for making an emergency landing in the case of aircraft operated in accordance with EDTO operations, and 30 minutes or 185 km (100 NM), whichever is the lesser, for all other aircraft:

a) life-saving rafts in sufficient numbers to carry all persons on board, stowed so as to facilitate their ready use in emergency, provided with such life-saving equipment including means of sustaining life as is appropriate to the flight to be undertaken;

b) equipment for making the pyrotechnical distress signals described in Annex 2; and

c) at the earliest practicable date, but not later than 1 January 2018, on all aeroplanes of a maximum certificated take-off mass of over 27 000 kg, a securely attached underwater locating device operating at a frequency of 8.8 kHz. This automatically activated underwater locating device shall operate for a minimum of 30 days and shall not be installed in wings or empennage.

(2) Each life jacket and equivalent individual flotation device, shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons, except where the requirement is met by the provision of individual flotation devices other than life jackets.

Note 1: Underwater locator beacon (ULB) performance requirements are as contained in the SAE AS6254, Minimum Performance Standard for Low Frequency Underwater Locating Devices (Acoustic) (Self-Powered)*, or equivalent documents.*

Note 2: Refer to PNG Advisory Circular AC 121-7 for information and guidance on Underwater Locating Devices (ULDs)

7. Flight Over Designated Land Areas -ICAO Annex 6 Part I, 6.6

Airworthiness Inspectors should check and verify compliance of all aircraft to PNG Rule 91.513(i) for operations-derived equipment required for flights over designated land areas as per the below ICAO Annex 6 Part 1, 6.6 standards:

ICAO Annex 6 Part I, 6.6 states:

Aircraft, when operated across land areas which have been designated by the Director, as areas in which search and rescue would be especially difficult, shall be equipped with such signalling devices and life-saving equipment (including means of sustaining life) as may be appropriate to the area overflown.

8. High Altitude Flights (Oxygen) - ICAO Annex 6 Part I, 6.7 & 6.12

Airworthiness Inspectors should check and verify compliance of all aircraft to PNG Rules: 91.532 and 91.535 for operations-derived equipment required for High Altitude flights, as applicable, comply with the below ICAO Annex 6 Part 1, 6.7 and 6.12 standards:

ICAO Annex 6 Part I, 6.7 states:

(1) An aircraft intended to be operated at flight altitudes above FL100 shall be equipped with oxygen storage and dispensing apparatus capable of storing and dispensing oxygen.

(2) An aircraft intended to be operated at flight altitudes above FL100 but which is provided with means of maintaining cabin altitude less than FL100 shall be provided with oxygen storage and dispensing apparatus capable of storing and dispensing the oxygen.

(3) All Pressurized aeroplanes newly introduced into service on or after 1 July 1962 and intended to be operated at flight altitudes above FL250 shall be equipped with a device to provide positive warning to the flight crew of any dangerous loss of pressurization.

(4) **ICAO Recommends that All** *Pressurized aeroplanes introduced into service before 1 July 1962 and intended to be operated at flight altitudes above FL250 should be equipped with a device to provide positive warning to the flight crew of any dangerous loss of pressurization.*

(5) An aircraft intended to be operated at flight altitudes above FL250, or which, if operated at flight

altitudes below FL250, cannot descend safely within four minutes to a flight altitude of FL130 and for which the individual certificate of airworthiness is first issued on or after 9 November 1998, shall be provided with automatically deployable oxygen equipment. The total number of oxygen dispensing units shall exceed the number of passenger and cabin crew seats by at least 10 per cent.

(6) **ICAO Recommends that** *an aircraft intended to be operated at flight altitudes above FL250, or which, if operated at flight altitudes below FL250 but cannot descend safely within four minutes to a flight altitude at FL130, and for which the individual certificate of airworthiness was first issued before 9 November 1998, should be provided with automatically deployable oxygen equipment. The total number of oxygen dispensing units should exceed the number of passenger and cabin crew seats by at least 10 per cent.*

Note: Approximate altitude in the Standard Atmosphere corresponding to the value of absolute pressure used in this text is as follows:

Absolute pressure	Metres	Feet
700 hPa	*3 000*	*10 000*
620 hPa	*4 000*	*13 000*
376 hPa	*7 600*	*25 000*

ICAO Annex 6 Part I, 6.12 requirements for High Altitude Flights above FL490

RADIATION INDICATOR (as applicable)

All aircraft intended to be operated above 15 000 m (49 000 ft) shall carry equipment to measure and indicate continuously the dose rate of total cosmic radiation being received (i.e. the total of ionizing and neutron radiation of galactic and solar origin) and the cumulative dose on each flight. The display unit of the equipment shall be readily visible to a flight crew member.

Note: The equipment is calibrated on the basis of assumptions acceptable to the Director.

9. Icing Conditions -ICAO Annex 6 Part I, 6.8

Airworthiness Inspectors should check and verify compliance of all aircraft to PNG Rule 91.433 for operations-derived equipment required for flights in Icing conditions to comply with the below ICAO Annex 6 Part 1, 6.8 standards:

ICAO Annex 6 Part I, 6.8 states:

All aircraft shall be equipped with suitable de-icing and/or anti-icing devices when operated in circumstances in which icing conditions are reported to exist or are expected to be encountered.

10. GPWS - ICAO Annex 6 Part I, 6.15

Airworthiness Inspectors should check and verify compliance of all aircraft to PNG Rule 91.362, 91.377 and 91.379 for operations-derived equipment required for GPWS installations to comply with the below ICAO Annex 6 Part 1, 6.15 standards:

ICAO Annex 6 Part I, 6.15 states:

6.15.1 All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than nine passengers shall be equipped with a ground proximity warning system which has a forward-looking terrain avoidance function. (Refer Rule 125.362(a))

6.15.2 The operator shall implement database management procedures that ensure the timely distribution and update of current terrain and obstacle data to the ground proximity warning system. (Refer Rule 121.377 (c))

6.15.3 ICAO **Recommendation.—** *All turbine-engined aeroplanes of a maximum certificated take-off mass of 5 700 kg or less and authorized to carry more than five but not more than nine passengers should be equipped with a ground proximity warning system which provides the warnings of 6.15.7 a) and c), warning of unsafe terrain clearance and a forward looking terrain avoidance function. (Refer Rule 121.362)*

6.15.4 All turbine-engined aeroplanes of a maximum certificated take-off mass of 5 700 kg or less and authorized to carry more than five, but not more than nine, passengers for which the individual certificate of airworthiness is first issued on or after 1 January 2026, shall be equipped with a ground proximity warning system which provides the warnings of 6.15.7 a) and c), warning of unsafe terrain clearance, and a forward looking terrain avoidance function. (Refer Rule 121.362)

6.15.5 All piston-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than nine passengers shall be equipped with a ground proximity warning system which provides the warnings in 6.15.7 a) and c), warning of unsafe terrain clearance and a forward-looking terrain avoidance function. (Refer Rule 121.379(b))

6.15.6 A ground proximity warning system shall provide automatically a timely and distinctive warning to the flight crew when the aeroplane is in potentially hazardous proximity to the earth's surface. (Refer Rule 121.377(b) & 121.379)

6.15.7 A ground proximity warning system shall provide, unless otherwise specified herein, warnings of the following circumstances:

a) excessive descent rate;

b) excessive terrain closure rate;

c) excessive altitude loss after take-off or go-around;

d) unsafe terrain clearance while not in landing configuration:

1) gear not locked down;

2) flaps not in a landing position; and

e) excessive descent below the instrument glide path. (Refer Rule 121.377)

11. ELT - ICAO Annex 6 Part I, 6.17 & 6.18 for ELT (DT)

Airworthiness Inspectors should check and verify compliance of all aircraft to PNG Rule 91.529 for operations-derived equipment required for ELT installations to comply with the below ICAO Annex 6 Part 1, 6.17 standards:

For ELT: ICAO Annex 6 Part I, 6.17 states:

6.17.1 **ICAO Recommendation.—** *All aeroplanes should carry an automatic ELT. (Refer Rule 91.529 & Part 91 Appendix A.15)*

6.17.2 Except as provided for in 6.17.3, all aeroplanes authorized to carry more than 19 passengers shall be equipped with at least one automatic ELT or two ELTs of any type. *(Refer Rule 91.529 & Part 91 Appendix A.15)*

6.17.3 All aeroplanes authorized to carry more than 19 passengers for which the individual certificate of airworthiness is first issued after 1 July 2008 shall be equipped with either *(Refer Rule 91.529 & Part 91 Appendix A.15)*:

a) at least two ELTs, one of which shall be automatic; or

b) at least one ELT and a capability that meets the requirements of 6.18.

Note.— In the case where the requirements for 6.18 are met by another system no automatic ELT is required.

6.17.4 Except as provided for in 6.17.5, all aeroplanes authorized to carry 19 passengers or less shall be equipped with at least one ELT of any type. *(Refer Rule 91.529 & Part 91 Appendix A.15*

6.17.5 All aeroplanes authorized to carry 19 passengers or less for which the individual certificate of airworthiness is first issued after 1 July 2008 shall be equipped with at least one automatic ELT. *(Refer Rule 91.529 & Part 91 Appendix A.15)*

6.17.6 ELT equipment carried to satisfy the requirements of 6.17.1, 6.17.2, 6.17.3, 6.17.4 and 6.17.5 shall operate in accordance with the relevant provisions of Annex 10, Volume III.

Note: The judicious choice of numbers of ELTs, their type and placement on aircraft and associated floatable life support systems will ensure the greatest chance of ELT activation in the event of an accident for aircraft operating over water or land, including areas especially difficult for search and rescue. Placement of transmitter units is a vital factor in ensuring optimal crash and fire protection. The placement of the control and switching devices (activation monitors) of automatic fixed ELTs and their associated operational procedures will also take into consideration the need for rapid detection of inadvertent activation and convenient manual switching by crew members.

[Refer Rule 91.529 & Part 91 Appendix A.15]

For ELT (DT): ICAO Annex 6 Part I, 6.18 states:

6.18.1 As of 1 January 2025, all aircraft of a maximum certificated take-off mass of over 27 000 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2024, **shall autonomously transmit information from which a position can be determined** by the operator **at least once every minute**, when in distress, in accordance with Appendix 9. (See Rule 91.531)

6.18.2 **ICAO Recommendation.—** *All aircraft of a maximum certificated take-off mass of over 5 700 kg for which the individual certificate of airworthiness is first issued on or after 1 January 2023, should autonomously transmit information from which a position can be determined at least once every minute, when in distress, in accordance with Appendix 9.*

6.18.3 The operator shall make **position information of a flight in distress available** to the appropriate organizations, as established by the State of the Operator.

Note 1: Operational procedures for monitoring and making position information of a flight in distress available to the appropriate organizations in a timely manner are contained in PANS-OPS, Volume III, Section 10.

Note 2: CASA PNG Advisory Circular AC 91-31 GADSS & LADR provides detailed guidance on LADR.

12. ACAS II -ICAO Annex 6 Part I, 6.19

Airworthiness Inspectors should check and verify compliance of all aircraft to PNG Rule 91.381 for operations-derived equipment required for ACAS II installations to comply with the below ICAO Annex 6 Part 1, 6.19 standards:

For ACAS II: ICAO Annex 6 Part I, 6.19 states:

6.19.1 All turbine-engined aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg or authorized to carry more than 19 passengers shall be equipped with an airborne collision avoidance system (ACAS II). (See Rule 121.381)

6.19.2 **ICAO Recommendation —** *All aeroplanes should be equipped with an airborne collision avoidance system (ACAS II).*

6.19.3 An airborne collision avoidance system shall operate in accordance with the relevant provisions of Annex 10, Volume IV. (See Part 121 Appendix A.11)

13. APPENDIX A: Certificate of Airworthiness Checklist CA21-121 for Large Transport Aircraft

This CASA CofA Checklist is self-explanatory and is used by the CASA Airworthiness Inspector during a CofA Inspection to verify installation of operations-derived equipment not part of the aircraft type certification.

14. APPENDIX B: Certificate of Airworthiness Checklist CA21-125 for Medium Transport Aircraft

This CASA CofA Checklist is self-explanatory and is used by the CASA Airworthiness Inspector during a CofA Inspection to verify installation of operations-derived equipment not part of the aircraft type certification.

15. APPENDIX C: Certificate of Airworthiness Checklist CA21-135 for Small Transport Aircraft

This CASA CofA Checklist is self-explanatory and is used by the CASA Airworthiness Inspector during a CofA Inspection to verify installation of operations-derived equipment not part of the aircraft type certification

16. APPENDIX D: Certificate of Airworthiness Checklist CA21-136 for Helicopters

This CASA CofA Checklist is self-explanatory and is used by the CASA Airworthiness Inspector during a CofA Inspection to verify installation of operations-derived equipment not part of the aircraft type certification