CIVIL AVIATION SAFETY AUTHORITY OF PAPUA NEW GUINEA

PNG
Civil Aviation Rule
Part 121

Air Operations – Large Aeroplanes

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DESCRIPTION

Part 121 prescribes the operating requirements for air operations conducted by a holder of an Air Operator Certificate issued in accordance with Part 119 using an aeroplane that has-

1. a seating configuration of more than 20 seats, excluding any required crew member seat; or
2. a payload capacity of more than 2500kg or
3. a MCTOW greater than 5700kg.

Part 121 also implements standardisation of regulatory requirements for all aircraft operators in these categories by establishing rules applicable to—

- a person performing an air operation
- a holder of an air operator certificate conducting an air operation
- a pilot-in-command performing an air operation
- additional aircraft equipment, instrument, and certification requirements and specifications
- aircraft maintenance
- crew training and competency
- management of flight crew fatigue

BULLETIN

This Part first came into force on 1 January 2011 and now incorporates the following amendment.

Amendment	Applicable Date
Amendment 1	01 January 2011
Amendment 2	01 April 2015
Amendment 3	01 May 2017
Amendment 4	01 February 2018
Amendment 5	13 November 2018
Amendment 6	04 December 2019
Amendment 7	14 December 2020
Amendment 8	02 November 2021
Amendment 9	03 April 2023
Amendment 10	03 November 2023
Amendment 11	04 November 2024
Amendment 12	21 March 2025
Amendment 13	19 November 2025
Amendment 14	26 November 2026

Summary of amendments:

Amendment 14 aligns Part 121 with Amendment 51 of ICAO Annex 6 Part I requirements

Amendment 14:
(Docket26/17/CAR121/28)

(a) New Rules:

(1) 121.69 (b) (3) - transposing Annex 6 Part I standard 4.1.6

(2) 121.363 (a) - transposing Annex 6 Part I standard 6.2.2 and recommendation

(3) 121.363 (a)(1) - transposing Annex 6 Part I standard 6.2.2 and recommendation

(4) 121.363 (a) (2)- transposing Annex 6 Part I standard 6.2.2 and recommendation

(5) 121.363 (b)- transposing Annex 6 Part I standard 6.2.2 and recommendation

(6) 121.363 (b) (1) - transposing Annex 6 Part I standard 6.2.2 and recommendation

(7) 121.363 (b) (2)- transposing Annex 6 Part I standard 6.2.2 and recommendation

(8) 121.363 (b) (3)- transposing Annex 6 Part I standard 6.2.2 and recommendation

(9) 121.363 (b) (4)- transposing Annex 6 Part I standard 6.2.2 and recommendation

(10) 121.565 (b) (4) - establishing requirement for cabin crew member recurrent training schedule

(b) Amendments:

(1) 121.69 (b) deleted the following words “the aerodrome has”

(2) 121.69 (b)(1) deleted the following words “rescue fire equipment that is appropriate to the aeroplane type and is acceptable to the Director”

(3) 121. 69 (b) (1) transposing Annex 6 Part I standard 4.1.5

(4) 121.69 (b) (2) - added word “and”

(5) 7121.363 - amended current rule to include Annex 6 Part I standard 6.2.2 and recommendation

(6) 121.565 (b) (3)

(7) Appendix A.2 - deleted current texts

(c) Editorials

(1) 121.69 (b) delete word “of” and replacing with word “or”

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Subpart A — General

121.1 Purpose

This Part prescribes rules governing air operations using an aeroplane —

(1) having a certificated seating configuration of 20 seats or more, excluding any required crew member seat; or

(2) a payload capacity of more than 2500 kg; or

(3) a MCTOW greater than 5700kg.

121.3 Definitions and Abbreviations

In this Part—

Certificate holder means the holder of an air operator certificate.

Behavioural indicator means an overt action performed or statement made by any flight crew member that indicates how the crew is handling the event.

Core Competencies means a group of related behaviours, based on job requirements, which describe how to effectively perform a job and what proficient performance looks like. They include the name of the competency, a description, and a list of behavioural indicators.

Consolidation means the process by which a person, through practice and practical experience, increases proficiency in newly acquired knowledge and skills.

Evidence-based training (EBT) means training and assessment based on operational data that is characterized by developing and assessing the overall capability of a trainee across arange of core competencies rather than by measuring the performance in individual events or manoeuvres**.**

Fixed fuel reserve means a reserve of fuel for the safe completion of a flight taking account of any unplanned manoeuvring at a destination or alternate aerodrome that in ordinary circumstances is the fuel remaining on the aircraft on completion of the landing.

Line-operating flight time means flight time performed in air operations to which this Partapplies:

Manoeuvres means a sequence of deliberate actions to achieve a desired flight path. Flight path control may be accomplished by a variety of means including manual aircraft control and the use of auto flight systems.

121.5 Laws, regulations, and procedures

The certificate holder shall ensure that all persons employed, engaged, or contracted, by the certificate holder are familiar with the appropriate sections of the Act, Civil Aviation Rules,and procedures specified in the certificate holder’s exposition.

121.7 Crew member grace provisions

If a crew member who is required by Subparts H, I, or J, to take a test, a flight check, or be assessed completes the test, flight check or assessment within three calendar months beforethe date on which the test, flight check or assessment is required, the crew member is deemedto have completed the test, flight check or assessment on the date that it is required to be completed.

121.9 Flight simulator and other training device approval

(a) A holder of an air operator certificate must ensure that each flight simulator, or training device, on which flight credits may be accrued is specifically approved for—

(1) use by the certificate holder; and

(2) the aeroplane type and, if applicable, the particular variant within that type, for which the training or check is being conducted; and

(3) the particular manoeuvre, procedure, or crew member function involved.

(b) The certificate holder must ensure that any flight simulator or any training device that is used to accrue flight credits—

(1) has the same performance and functional characteristics as the aircraft type flown by the flight crew members for whom flight credits is sought; and

(2) is given a daily functional pre-flight check before being used and any discrepancy is logged by the appropriate flight crew supervisor or instructor at the end of each training or check flight.

Subpart B - Operating Rules

121.51 Purpose

This Subpart prescribes operating rules governing air operations.

121.53 Aeroplane airworthiness

The certificate holder shall ensure that each aeroplane operated by the holder has a current standard category airworthiness certificate.

121.55 Common language

A holder of an air operator certificate must ensure that—

(1) every crew member can communicate in a common language with flight crew members being able to communicate in the English language; and

(2) every operations person is able to understand the language in which the applicableparts of the certificate holder’s exposition are written.

121.57 Aeroplane proving flights

(a) A certificate holder who intends to introduce a new aeroplane type shall, prior to that aeroplane type being used in air operations, ensure that a programme of provingflights is conducted, in addition to the aeroplane certification tests, when proving flights acceptable to the Director have not been previously conducted in accordance with the requirements of the State of certification.

(b) The programme required by paragraph (a) shall consist of at least 100 hours of proving flights, including a representative number of flights into en-route aerodromes, and at least 10 hours’ night flight.

(c) A certificate holder who intends to introduce into its operation an aeroplane type that has been materially altered in design since the last proving flights shall, prior to that aeroplane type being used in air operations, ensure that a programme comprising at least 50 hours of proving flight is conducted.

(d) For the purpose of paragraph (c), an aeroplane type is considered to be materially altered in design if the alterations include—

(1) the installation of power plants of a type dissimilar to those installed at initial certification; or

(2) alterations to the aeroplane or its components that materially affect flight characteristics.

(3) A certificate holder who carries out an aeroplane proving flight shall restrict the carriage of personnel during the flight to necessary crew members and topersonnel who are—

(i) receiving familiarization or training; or

(ii) gaining line operating flight time; or

(iii) authorised to represent the Director.

121.59 Authorisation and control of operations

The certificate holder shall establish procedures for the authorisation and control of air operations including initiation, continuation and termination of an operation or series of airoperations.

121.60 Duties and qualification of flight operations officers or flightdespatchers

(a) A flight operations officer or despatcher engaged by the certificate holder in conjunction with the holder's approved method of control and supervision must:

(1) assist the pilot-in-command in flight preparation and provide the relevant information.

(2) assist the pilot-in-command in preparing the operational and ATS flight plans,sign when applicable and file the ATS flight plan with the appropriate ATS unit; and

(3) furnish the pilot-in-command while in flight, by appropriate means, with information which may be necessary for the safe conduct of the flight; and

(4) notify the appropriate ATS unit when the position of the aeroplane cannot be determined by an aircraft tracking capability and attempts to establish communication are unsuccessful.

(b) In the event of an emergency, a flight operations officer or flight dispatcher must.

(1) initiate such procedures as outlined in the certificate holder's expositions while avoiding taking any action that will conflict with ATC procedures; and

(2) convey safety-related information to the pilot-in-command that may be necessary for the safe conduct of the flight, including information related to any amendments to the flight plan that become necessary in the course of theflight.

(c) The certificate holder must not assign a flight operations officer or despatcher to duty unless that person has satisfactorily completed the operator-specific training course approved by the Director.

121.61 Flight preparation and planning

(a) The holder of an air operator certificate must ensure that for each air operation conducted under the authority of that certificate, appropriate information is available to the pilot-in-command to complete the preparation for the intended operation.

(b) The holder of an air operator certificate must ensure that prior to each air operationconducted under the authority of that certificate, an operational flight plan meetingthe requirements of 91.307 or 91.407 as appropriate for the type of operation is prepared.

(c) The holder of an air operator certificate must ensure that the operational flight planis approved and signed by the pilot-in-command and, where applicable, signed by the flight operations officer or flight dispatcher, and a copy must be filed with the operator or a designated agent, or, if these procedures are not possible, it must be left with the aerodrome authority or on record in a suitable place at the point of departure.

(d) Where operations personnel prepare an operational flight plan, the holder of the airoperator certificate must ensure that the personnel.

(1) are trained and competent to perform the task; and

(2) are notified as soon as practicable of each change in equipment and operating procedure or facilities.

(e) For the purpose of paragraph (d)(2), notifiable changes include changes to the use of navigation aids, aerodromes, ATC procedures and regulations, local aerodrome traffic control rules, and known hazards to flight including potentially hazardous meteorological conditions and irregularities in ground and navigation facilities.

(f) Notwithstanding 91.307(a), the holder of the air operator certificate must ensure that prior to any air operation the flight plan required by paragraph (b) is submitted to an appropriate ATS unit.

121.63 Operational flight plans

(a) The certificate holder shall establish an operational flight plan on which a scheduleof air operations is to be based.

(b) When establishing the operational flight plan, the certificate holder shall ensure that—

(1) the aeroplane operating cycle is calculated using data for that aeroplane that is contained in, or derived from, the manufacturer’s manuals and that conforms to the parameters contained in the aeroplanes type certificate; and

(2) the prevailing en-route winds are considered; and

(3) enough time is allowed for the proper servicing of each aeroplane at intermediate stops.

(c) The certificate holder shall ensure that during any 365-day period at least 80% of its regular air operations arrive at the planned destination within the parameters of the operational flight plan used to establish the schedule.

121.65 Emergency and survival equipment information

(a) The certificate holder shall have available, for immediate communication to rescue co-ordination centres, information on the emergency and survival equipment carried on board each of its aeroplanes.

(b) For extended over-water operations the information required by paragraph (a) shall include—

(1) the number, colour, and type of life rafts; and

(2) whether pyrotechnics are carried; and

(3) details of emergency medical supplies and water supplies; and

(4) the type and operating frequencies of any emergency portable radio equipment.

121.67 Ditching certificate

A holder of an air operator certificate must ensure that an aeroplane used on an extended over water operation is certified for ditching.

121.69 Use of aerodromes

(a) A holder of an air operator certificate must ensure that an aeroplane performing an air operation under the authority of the holder's certificate does not use an aerodrome for landing or taking off unless:

(1) the aerodrome has physical characteristics, obstacle limitation surfaces, and visual aids that meet the requirements of—

(i) the characteristics of the aeroplane being used; and

(ii) the lowest meteorological minima to be used.

(2) subject to their published condition of use, the aerodromes and their facilities are kept continuously available for flight operations during their published hours of operations, irrespective of weather conditions.

(b) A holder of an air operator certificate must ensure that an aeroplane performing an air operation under the authority of the holder's certificate does not use an aerodrome for landing or taking off unless–

(1) the level of rescue and firefighting service protection available at any aerodrome intended to be specified in the operational flight plan has been assessed to ensure that an acceptable level of protection is available for the aeroplane intended to be used;

(2) for turbojet and turbofan powered aeroplanes, an operating visual approach slope indicator system, except when the aeroplane is performing a precision instrument approach that includes glideslope guidance; and

(3) the information related to the level of rescue and firefighting service protection that is deemed acceptable shall be contained in the operations manual.

(c) A holder of an air operator certificate must ensure that an aeroplane performing an air operation under the authority of the holder's certificate does not use an aerodrome for landing or taking off unless the aerodrome is specified, individually or by grouping, in the certificate holder's exposition.

(d) Notwithstanding paragraph (e)(1), an aerodrome specified under paragraph (c), that is to be used as an alternate aerodrome by an aeroplane that has a certificated seating capacity of more than 20 passengers and is engaged on domestic air operations, may be a non-certificated aerodrome.

(e) Each aerodrome specified in the certificate holder's exposition under paragraph (c), that is to be used by an aeroplane that has a certificated seating capacity of more than 20 passengers and is engaged on a regular air operation, must be an aerodrome that—

(1) for Papua New Guinea aerodromes, is associated with an aerodrome operating certificate issued in accordance with Part 139; or

(2) for aerodromes outside Papua New Guinea, is associated with a certificatethat meets a standard that is equivalent to that required under Part 139 andissued by an ICAO contracting State.

(f) A holder of an air operator certificate must ensure the following information specified in a route guide or similar, for each aerodrome or groups of aerodromes specified under paragraph (c)—

(1) the route or segment of a route.

(2) the necessary level of flight crew training.

(3) the minimum flight crew experience.

(4) the flight crew pairing restrictions.

(5) the type of authorised flight operations.

(6) for non-certificated aerodromes used in accordance with the provisions of paragraph (d)-

(i) the aerodrome data; and

(ii) procedures for ensuring that the condition of the aerodrome is safefor that operation; and

(iii) procedures for ensuring that the condition of any required equipment,including safety equipment, is safe for that operation; and

(iv) details of any limitations on the use of the aerodrome.

(g) Except as provided in paragraph (h), a holder of an air operator certificate must ensure that any aeroplane performing an air operation under the authority of the holder's certificate does not land at or take off from a runway unless-

(1) the width of the runway to be used is at least that width determined in accordance with Table 2 of Appendix B.

(2) the width of the runway strip for the runway to be used is at least that width determined in accordance with Appendix B for the aeroplane and the runway type.

(h) A runway that has a width that is less than that required under paragraph (g) may be used by an aeroplane performing an air operation under the authority of an air operator certificate if-

(1) a lesser runway width is determined by certificated flight testing and is prescribed in the aeroplanes flight manual; or

(2) a lesser runway width is acceptable to the Director.

121.71 Fuel

(a) The certificate holder shall establish a fuel policy for the purpose of flight planning,and in-flight re-planning, to ensure that each aeroplane carries sufficient fuel for the planned operation meeting the applicable requirements of Part 91, including reserves to cover deviations from the planned flight.

(b) The fuel policy shall ensure that the planning of fuel requirements is based upon—

(1) procedures, tables, and graphs, that are contained in, or derived from, the manufacturer's manuals and that conform to the parameters contained in the aeroplanes type certificate; and

(2) the operating conditions under which the flight is to be conducted, including—

(i) normal aeroplane fuel consumption data; and

(ii) anticipated weights; and

(iv) expected meteorological conditions; and

(iv) ATS requirements and restrictions; and

(v) the geographic location of the destination aerodrome; and

(vi) the effect on fuel consumption of identified contingencies.

(c) Except as provided in paragraph (d), the certificate holder shall ensure that the calculation of usable fuel required for an operation takes into account the followingfactors—

(1) taxi fuel; and

(2) trip fuel; and

(3) reserve fuel, consisting of—

(i) contingency fuel; and

(ii) alternate fuel, if an alternate aerodrome is required; and

(iii) fixed fuel reserve; and

(iv) additional fuel, if required by the type of operation.

(d) The certificate holder may vary the factors required to be taken into account in paragraph (c) to accommodate the en-route re-planning procedure if the variation isprovided for in the certificate holder's exposition.

121.73 Flight check system

(a) The certificate holder shall ensure that flight crew members have available for use a flight check system that includes

(1) instructions and guidelines for the safe and efficient management of the flightdeck; and

(2) methods used to conduct the flight safely.

(3) The certificate holder shall ensure that the system enables safe real-time decision making and aeroplane management by conforming with the principles—

(i) contained in the aeroplane flight manual; and

(ii) contained in the manufacturer's technical and safety instructions; and

(iii) of crew resource management; and

(iv) of human factors and psychology; and

(v) of ergonomics.

(4) The certificate holder shall ensure that the system includes—

(i) an expanded checklist in the operations manual; and

(ii) scan checks; and

(iii) a quick reference handbook; and

(iv) a checklist for procedures, including emergency procedures.

(5) The certificate holder shall ensure that the system contains procedures,available for use at each flight crew member’s duty station, to be followed bythem—

(i) prior to and during take-off; and

(ii) in flight; and

(iii) on landing; and

(iv) during normal, non-normal, and emergency situations.

121.75 Emergency light operation

The certificate holder shall ensure that each emergency light system required by Part 26 Appendix D is armed or turned on during taxiing, take-off, and landing.

121.77 Passenger safety

The certificate holder shall ensure that—

(1) passengers are seated where, in the event of an emergency evacuation, they will nothinder evacuation from the aeroplane; and

(2) any passenger who appears to be under the influence of alcohol or drugs or exhibits behavioural characteristics, to the extent where the safety of the aeroplane or its occupants is likely to be endangered, is refused embarkation or, where appropriate,removed from the aeroplane; and

(3) disabled passengers are appropriately cared for, including allocation of appropriate seating positions and handling assistance in the event of an emergency; and

(4) children under the age of 15 years, and adults with an infant, are not seated in any seat row next to an emergency exit; and

(5) escorted passengers do not constitute a safety hazard to other passengers or to the aeroplane, and that prior arrangements for their carriage have been made in accordance with procedures specified in the certificate holder’s exposition; and

(6) the senior cabin crew member, or the pilot-in-command, is notified when a disabled or escorted person is to be carried on board the aeroplane.

121.79 Passenger information

(a) If illuminated *Fasten Seat Belt* signs are installed in an aeroplane, they must be lit—

(1) while the aeroplane is moving on the ground; and

(2) for each take-off; and

(3) for each landing; and

(4) at any other time considered necessary by the pilot-in-command.

(5) The certificate holder shall ensure that passengers are informed, either by illuminated *No Smoking* signs or by approved *No Smoking* placards, when smoking is prohibited in the aeroplane.

(6) If illuminated *No Smoking* signs are installed in an aeroplane, they must be lit when smoking is prohibited.

121.81 Flight compartment admission

(a) The certificate holder shall ensure at least one forward-facing observer's seat is available in the flight compartment, on each aeroplane performing air operations, that is suitable for the carriage of those persons listed in paragraph (b).

(b) The certificate holder shall ensure that no person, other than the flight crew members assigned to the flight, is admitted to, or carried in, the flight compartment,or occupies a pilot seat, unless that person is permitted by the pilot-in-command, and is—

(1) a crew member; or

(2) an authorised representative of the Director; or

(3) permitted by the holder of the air operator certificate in accordance with procedures specified in the certificate holder's exposition; and

(4) a holder of a jump seat approval issued by the Director.

(c) The certificate holder shall ensure that all persons admitted to the flight compartment or occupying a pilot seat are familiarised with the appropriate safety procedures specified in the certificate holder's exposition.

121.83 Manipulation of controls

(a) The certificate holder shall ensure that no person is permitted to manipulate the flight controls of its aeroplanes that are performing air operations, unless the personis—

(1) a flight crew member qualified in accordance with 121.503 and authorised bythe certificate holder; or

(2) an authorised representative of the Director, qualified in accordance with121.503, who—

(i) has the permission of the certificate holder and the pilot-in-command;and

(ii) is performing a required duty.

(b) No person shall manipulate the controls of an aeroplane performing an air operation, unless the person is authorised in accordance with paragraph (a)(1) or (2).

121.85 Flight recorder requirements

(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 isused 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) 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.

(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) 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 beforetheir 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-offmass 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.

121.87 Refuelling and de-fuelling operations

(a) Despite the requirements of rule 91.15(2), a person operating an aeroplane under the authority of an air operator certificate may refuel or defuel the aeroplane with a Class 3.1 C or a Class 3.1D flammable liquid (aviation turbine grade fuel) when a person is embarking, on board, or disembarking the aeroplane, providing the person operating the aeroplane ensures that-

(1) safety and aeroplane evacuation precautions are taken in accordance with procedures specified in the certificate holder's exposition; and

(2) two-way communication must be maintained by the aeroplanes inter- communication system or other suitable means between the ground crew supervising the refuelling and the qualified personnel on board the aeroplane.

(b) A person operating an aeroplane under the authority of an air operator certificate may refuel or defuel the aeroplane with a Class 3.1C or a Class 3.1D flammable liquid (aviation turbine grade fuel) with one or more propulsion engines running, provided that—

(1) every passenger is disembarked under supervision of a crew member and is clear of the immediate area before refuelling or defueling commences; and

(2) the pilot-in-command is responsible for every aspect of the fuelling operation.

121.89 Fuel spillage

The certificate holder shall ensure that, where fuel is spilled onto an impermeable surface while fuelling an aeroplane and that fuel is likely to endanger persons or property—

(1) fuelling is stopped; and

(2) immediate action is taken to cover the fuel with sand, sawdust, dry earth, or an agent such as foam or dry chemical extinguisher powder, to reduce the fire hazard; and

(3) the aeroplane is then moved clear of the contaminated area before any engine is started.

121.91 Reserved

121.93 Restriction or suspension of operations

The certificate holder of an air operator certificate shall, on becoming aware of any condition that is a hazard to safe operations, restrict or suspend operations as necessary until the hazard is removed.

121.95 Emergency situation action plans

(a) Each holder of an air operator certificate shall ensure action plans are developed for handling in- air and on-ground emergency situations and minimizing risk of injuryto persons.

(b) The certificate holder's emergency situation action plan shall be based upon data including

but not restricted to—

(1) type and length of routes over which operations are carried out; and

(2) aerodrome ground facilities; and

(3) local emergency services; and

(4) ATC facilities; and

(5) type, seating configuration, and payload of the aeroplane likely to be involved.

(c) The certificate holders in-air emergency plan shall include the following—

(1) if management personnel become aware of an emergency situation arising on an aeroplane during flight that requires immediate decision and action,procedures to be followed by those personnel to ensure that—

(i) the pilot-in-command is advised of the emergency; and

(ii) the decision of the pilot-in-command is ascertained; and

(iii) the decision is recorded; and

(2) if management personnel are unable to communicate with the pilot-in- command in accordance with paragraph (c)(1), procedures to be followed by those personnel to ensure that—

(i) an emergency is declared; and

(ii) any action considered necessary under the circumstances is taken.

(d) The certificate holder shall ensure appropriate staff are trained and competent to perform during emergencies in accordance with the emergency situation action plan.

121.97 Security of the flight crew compartment

(a) The pilot-in-command of an aeroplane performing an air transport operation carrying passengers must ensure that the flight crew compartment door is closed and locked when all the external doors have been closed following embarkation until an external door is opened for disembarkation, except to permit entry or exit of a person permitted by the pilot-in-command.

(b) The holder of an air operator certificate who conducts an international air transport operation, must ensure that an approved flight crew compartment door is fitted to each passenger-carrying aeroplane with:

(1) a maximum certificated take-off mass in excess of 54 500 kg; or

(2) a maximum certificated take-off mass in excess of 45 500 kg and a passenger seating capacity greater than 19; or

(3) a passenger seating capacity greater than 60.

(c) The flight compartment door referred to in paragraph (b), must be capable of:

(1) resisting penetration by small arms fire, grenade shrapnel and forcible intrusions by unauthorized persons; and

(2) being locked and unlocked from either pilot’s station.

121.99 Monitoring the area outside the flight crew compartment door

The pilot-in-command of an aeroplane which is equipped with a flight crew compartment door in accordance with 121.97(b) performing an international air transport operation carrying passengers must ensure that a crew member does not unlock the flight crew compartment door unless the crew member uses a visual device and an audio procedure acceptable to the Director to verify that—

(1) the entire door area outside the flight crew compartment is secure and monitored from either pilot's station; and

(2) the person seeking to have the flight crew compartment door opened is not being forced to do so; and

(3) The person(s) requesting entry is identified and there is no suspicious behaviour or potential threat.

121.101 Discreet communication with a flight crew member

A holder of an air operator certificate who conducts an air transport operation carrying passengers must establish procedures that are acceptable to the Director for ensuring that a cabin crew member can discreetly notify a flight crew member if suspicious activity or a security breach is detected in the cabin.

121.103 Search and Rescue Information

Each holder of an air operator certificate shall, for each aeroplane it operates, ensure that all relevant information concerning the search and rescue services in the area over which the aeroplane will be flown is available on board.

121.105 Aircraft Tracking

(a) Each holder of an air operator certificate shall.

(1) establish an aircraft tracking capability to track aeroplanes throughout its area of operation.

(2) track the position of an aeroplane through automated reporting at least every 15 minutes for the portion(s) of the in-flight operation(s) that is planned in an oceanic area(s) under the following conditions:

(i) the aeroplane has a maximum certificated take-off mass of over 45 500kg and a seating capacity greater than 19.

(ii) where an ATS unit obtains aeroplane position information at greater than 15-minute intervals

(b) Each holder of an air operator certificate shall establish procedures, approved by the Director for the retention of aircraft tracking data to assist SAR in determining the last known position of the aircraft.

(c) Notwithstanding paragraph (a), the Director may, based on the results of an approved risk assessment process implemented by the operator, allow for variations to automated reporting intervals. The process shall demonstrate how risks to the operation, resulting from such variations, can be managed and must include at least the following:

(1) capability of the operator's operational control systems and processes, including those for contacting ATS units.

(2) overall capability of the aeroplane and its systems.

(3) available means to determine the position of, and communicate with, the aeroplane.

(4) frequency and duration of gaps in automated reporting.

(5) human factors consequences resulting from changes to flight crew procedures; and

(6) specific mitigation measures and contingency procedures.

Subpart C — Operating Limitations and Meteorological Requirements

121.151 Purpose

This Subpart prescribes the rules governing VFR and IFR operations and associated meteorological requirements.

121.153 Meteorological information

(a) The certificate holder shall ensure that each air operation is planned, performed, and controlled using, if available, meteorological information provided for aviationpurposes by—

(1) subject to paragraph (b), for each flight sector originating within Papua New Guinea, the holder of an aviation meteorological service organisation certificate issued under Part 174; or

(2) for each sector originating from an aerodrome outside Papua New Guinea, an aviation meteorological service organisation that is authorised by an ICAO contracting State.

(b) A pilot-in-command may, for each flight sector that originates and terminates within Papua New Guinea, if available, use a basic weather report that is provided in accordance with 174.6 to perform an instrument approach and landing.

121.155 Meteorological conditions – VFR flight

(a) The pilot-in-command shall not commence a flight under VFR unless, if available,current meteorological reports, or a combination of current reports and forecasts, indicate VFR minima prescribed in 91.301 can be complied with along the route, or that part of the route to be flown under VFR.

(b) A pilot-in-command shall not carry out an air operation under VFR above more than broken cloud unless—

(1) the aeroplane meets the requirements for IFR flight and the required minimum flight crew for IFR operation, holding current instrument rating qualifications, is at the controls; and

(2) the instruments and equipment, including radio navigation equipment, required for IFR flight are operative; and

(3) the aeroplane is capable, with one engine in operative, of maintaining a net flight path that has a positive slope at 1000 feet above the cloud; and

(4) the aeroplane carries radio navigation equipment enabling it to be navigated by IFR to an aerodrome where an instrument approach procedure may be carried out for landing; and

(5) if the pilot-in-command cannot determine that the meteorological conditions at the destination aerodrome are suitable for an approach and landing under VFR, the aeroplane carries sufficient fuel and fuel reserves to proceed by IFR to an aerodrome where an instrument approach procedure may be carried out for landing.

121.157 Meteorological conditions and alternate aerodromes – IFR flight

(a) The pilot-in-command shall not commence a flight under IFR unless current meteorological reports, or a combination of current reports and forecasts, if available, indicate that conditions will, at the estimated time of arrival, or at the estimated time of commencing an instrument approach, taking any "INTER" or "TEMPO" meteorological conditions into account at the applicable destination aerodrome, be at or above the minimum prescribed under Part 95 for the instrument approach procedure likely to be used at that aerodrome; and

(b) Each person performing EDTO shall ensure that before the aeroplane is further than one hour from an adequate aerodrome each aerodrome designated as an en-route alternate aerodrome will, at the possible time of use, be at or above the approved weather minima specified in the certificate holder's exposition.

(c) The time of one hour specified in paragraph (b) shall be at the one-engine inoperative cruising speed under standard conditions in still air.

(d) Notwithstanding paragraphs (a), (b) and (c), the Director may approve operational variations to alternate aerodrome selection criteria based on the result of specific safety risk assessments demonstrating that a certificate holder will maintain an equivalent level of safety. The specific safety risk assessment must include at least the:

(1) capabilities of the certificate holder.

(2) overall capability of the aeroplane and its systems.

(3) available aerodrome technologies, capabilities and infrastructure.

(4) quality and reliability of meteorological information.

(5) identified hazards and safety risks associated with each alternate aerodrome variation; and

(6) specific mitigation measures

(e) The certificate holder in determining whether or not an approach and landing can be safely carried out at each alternate aerodrome must.

(1) specify appropriate incremental values for height of cloud base and visibilityto be added to the certificate holder's established aerodrome operating minima that ensures an adequate margin of safety is observed; and

(2) the incremental values must be acceptable to the Director.

121.159 Aerodrome Operating Minima – IFR flights

(a) A pilot-in-command of an aeroplane must not continue an instrument approach to an aerodrome past the final approach fix or, if a final approach fix is not used, must not

commence the final approach segment of the instrument approach procedure if,before passing the final approach fix or before commencing the final approach segment, current meteorological information indicates that the visibility at the aerodrome is less than the minimum visibility published in the applicable AIP for the instrument approach procedure being used.

(b) For the purpose of paragraph (a), the final approach segment begins—

(1) at the final approach fix or facility specified in the instrument approach procedure; or

(2) if a final approach fix is not specified in the instrument approach procedure and the procedure includes a procedure turn, at the point where the procedure turn is completed and the aeroplane is established on the final approach coursewithin the distance specified in the instrument approach procedure.

(c) Notwithstanding paragraphs (a) and (b), a certificate holder establishing aerodrome operating minima for aerodromes to be used in air operations must ensure that—

(1) the method of determining aerodrome operating minima is approved by the Director; and

(2) the operator takes full account of; —

(i) the type, performance and handling characteristics of the aeroplane andany conditions or limitations stated in the flight manual

(ii) the composition of the flight crew, their competence and experience.

(iii) the dimensions and characteristics of the runways which may be selected for use.

(iv) the adequacy and performance of the available visual and non-visual ground aids.

(v) the equipment available on the aeroplane for the purpose of navigation, acquisition of visual references and/or control of the flight path during the approach, landing and the missed approach.

(vi) the obstacles in the approach and missed approach areas and the obstacle clearance altitude/height for the instrument approach procedures.

(vii) the means used to determine and report meteorological conditions.

(viii) the obstacles in the climb-out areas and necessary clearance margins.

(ix) the conditions prescribed in the operations specifications; and

(x) any minima that may be promulgated by the state of the aerodrome

121.161 IFR departure limitations

The pilot-in-command shall not commence a flight under IFR when the meteorological conditions at the aerodrome of departure are below the authorised minimum altitude prescribed under Part 95 for the instrument approach procedure likely to be used at the aerodrome of departure, unless there is an aerodrome meeting the requirements of 121.69 —

(1) for a two-engine aeroplane, within a maximum of one-hour flying time, in still air at one engine inoperative cruising speed, determined from the aircraft operating manual, calculated in ISA and still-air conditions using the actual take-off mass: or

(2) for an aeroplane having three or more engines, within a maximum of two hours flying time, in still air at an all-engines operating cruising speed, determined from the aircraft operating manual, calculated in ISA and still-air conditions using the actual take-off mass; or

(3) for aeroplanes engaged in extended diversion time operations (EDTO) where an alternate aerodrome meeting the distance criteria of (1) or (2) is not available, the first available alternate aerodrome located within the distance of the operator's specified maximum diversion time considering the actual take-off mass.

121.163 Reduced take-off minima

(a) The certificate holder may operate an aircraft at lower take-off minima than that prescribed in 91.413(a) provided the certificate holder ensures that the operation is conducted in accordance with the reduced minima take- off procedure specified in the certificate holder's exposition.

(b) The reduced take-off minima procedure shall ensure that, in addition to the requirements of 91.413(b)—

(1) the pilot-in-command and the second-in-command are qualified for reduced minima take-offs in accordance with rule 121.513; and

(2) the runway visibility is established using RVR; and

(3) the method for observing and confirming that the required visibility exists for the take-off is acceptable to the Director.

121.165 Route distance limitations

(a) A holder of an air operator certificate must not operate a piston engine aeroplane on an air operation on a route that requires the aeroplane to be more than 60 minutes' flight time (calculated at a one engine inoperative cruise speed in still air and ISA conditions)from an adequate aerodrome.

(b) A holder of an air operator certificate must not operate an aeroplane with 2 turbine powered engines on an air operation on a route that requires the aeroplane to be more than 60 minutes' flight time (calculated at a one engine inoperative cruise speed in stillair and ISA conditions) from an adequate aerodrome unless—

(1) except as provided in rule 121.955(b), the aeroplane is certificated to type design specifications for operating more than 60 minutes' flight time (calculated at a one engine inoperative cruise speed in still air and ISA conditions) from an adequate aerodrome; and

(2) the certificate holder is issued a specific approval in accordance with Subpart Nto conduct EDTO; and

(3) the aeroplane is operated in accordance with applicable EDTO requirements prescribed in this Part.

(c) Subject to paragraph (d), a holder of an air operator certificate must not operate an aeroplane with more than 2 turbine powered engines on an air operation on a route that requires the aeroplane to be more than 180 minutes' flight time (calculated at a one engine inoperative cruise speed in still air and ISA conditions) from an adequate

aerodrome unless the certificate holder is authorised in accordance with Subpart N to conduct EDTO and the aeroplane is operated in accordance with applicable EDTO requirements prescribed in this Part.

(d) Paragraph (c) does not apply to a holder of an air operator certificate until 01 January 2019.

121.167 Reserved

121.169 IFR procedures

(a) The pilot-in-command shall conduct IFR air operations on routes prescribed under Part 95, except when—

(1) it is necessary to avoid potentially hazardous conditions; or

(2) operating under radar control from an ATS; or

(3) operating under an off-route clearance obtained from the appropriate ATC unit; or

(4) otherwise specified in the exposition of the holder of the air operator certificate that authorises the operation.

(b) Unless a clearance has been obtained from the appropriate ATC unit, in controlled airspace, the pilot-in- command shall comply with any IFR departure and approach procedures prescribed under Part 95 for the appropriate aerodrome.

(c) In uncontrolled airspace the pilot-in-command shall comply with any IFR departure and approach procedures prescribed under Part 95 for the appropriate aerodrome.

Subpart D — Performance

121.201 Purpose

This Subpart prescribes aeroplane performance operating limitations.

121.203 Applicability

(a) A certificate holder shall ensure that each aeroplane it operates under this Part complies with the requirements of this Subpart.

(b) A certificate holder operating an aeroplane under Part 125 or Part 135 that is certificated to FAR 25 standards or equivalent airworthiness standard must ensure compliance with the requirements of this Subpart.

(c) Aeroplanes that cannot fully comply with the requirements of this Subpart may be approved to operate under alternative performance operating limitations.

121.205 General performance

A certificate holder shall ensure that, for each aeroplane it operates—

(1) the take-off weight at the start of take-off is not greater than the weight permitted under this Subpart for the flight to be undertaken allowing for—

(i) expected reductions in weight as the flight proceeds; and

(ii) such fuel jettisoning as is provided for under this Subpart; and

(2) the performance data used to determine compliance with the performance requirements of this Subpart is—

(i) contained in the aeroplane flight manual; or

(ii) in the case of contaminated runway landing distance data, provided by the aeroplane manufacturer and acceptable to the Director.

121.207 Take-off limitations

(a) A certificate holder shall ensure that, for each aeroplane it operates, the take-off weight does not exceed the maximum take-off weight specified in the aeroplane flight manual.

(b) When calculating the maximum take-off weight to determine compliance with paragraph (a), the certificate holder shall, assuming that the critical engine fails at VEF and using a single V1, ensure that—

(1) the accelerate-stop distance required does not exceed the accelerate-stop distance.

(2) available; and

(3) the take-off distance required does not exceed the take-off distance available;and

(4) any clearway forming part of the take-off distance available shall not exceed half the length of the take-off run available; and

(5) in the case of a contaminated runway, the take-off distance is calculated to the point at which the aircraft reaches a height of 15 feet above the take-off surface using a reduced V1; and

(6) the take-off run required does not exceed the take-off run available using V1for the rejected and continued take-off.

(c) When calculating the maximum take-off weight in accordance with paragraph (b),the certificate holder shall take account of—

(1) aerodrome elevation; and

(2) the pressure altitude of the aerodrome when the atmospheric pressure varies by more than 1% from the International Standard Atmosphere; and

(3) ambient temperature at the aerodrome; and

(4) the type of runway surface and the runway surface condition; and

(5) the runway slope in the direction of take-off; and

(6) not more than 50% of the reported headwind component or not less than 150%of the reported tailwind component.

121.209 Runway surface correction factors

A certificate holder shall ensure that, unless alternative performance data acceptable to the Director is available and used, the take-off distance calculated for a runway surface type under121.207(c)(4) and the landing distance calculated under 121.221(c)(3), are corrected for use of other runway surface types by applying the factors in Table 1.

Table 1

Surface Type	Take-off Distance	Accelerate-stop Distance	LandingDistance
Paved	x 1.00	x 1.00	x 1.00
Coral	x 1.00	x 1.03	x 1.05
Metal	x 1.05	x 1.06	x 1.08
Rolled earth	x 1.08	x 1.14	x 1.16
Grass	x 1.14	x 1.20	x 1.18

121.211 Net take-off flight path

(a) For the purposes of this rule, the net take-off flight path begins at the point the take-off distance required finishes, (which is either at a point where a 35ft screen height is achieved or another height specified in the approved flight manual) and finishes at the point the aircraft either attains a height of 1500ft above the take-off surface, or reaches the take-off power time limit or completes the transition to en route configuration.

(b) A certificate holder shall ensure that, for each aeroplane it operates, assuming the critical engine is inoperative, all obstacles within the net take-off flight path are cleared vertically by at least—

(1) 35 feet in the case of a take-off performed by an aeroplane that is intended touse a bank angle not exceeding 15°; and

(2) 15 feet in the case of a take-off that is—

(i) performed by an aeroplane that is intended to use a bank angle not exceeding 15°; and

(ii) conducted in compliance with 121.207(b)(4); and

(3) 50 feet in the case of a take-off performed by an aeroplane that is intended touse a bank angle exceeding 15°; and

(4) 30 feet in the case of a take-off that is—

(i) performed by an aeroplane that is intended to use a bank angle exceeding 15°; and

(ii) conducted in compliance with 121.207(b)(4).

(c) For the purpose of paragraph (b), an obstacle shall be deemed to be within the net take-off flight path if the lateral distance from the obstacle to the intended line of flight does not exceed—

(1) where the intended flight path does not require a track change exceeding 15°—

(i) 75 m plus 0.125D, to a maximum of 600 m or, if the certificate holder has established visual or radio navigation track guidance procedures forthe pilot, to a maximum of 300 m; or

(ii) for day operations in VMC by aeroplanes not exceeding 22 700 kg MCTOW, 45 m plus 0.125D, to a maximum of 600 m or, if the certificate holder has established visual or radio navigation track guidance procedures for the pilot, to a maximum of 300 m; or

(2) where the intended flight path requires a track change exceeding 15°—

(i) 75 m plus 0.125D, to a maximum of 900 m or, if the certificate holder has established visual or radio navigation track guidance procedures forthe pilot,

to a maximum of 600 m.

(ii) for day operations in VMC by aeroplanes not exceeding 22 700 kg MCTOW, 45 m plus 0.125D, to a maximum of 900 m or, if the certificate holder has established visual or radio navigation track guidance procedures for the pilot, to a maximum of 600 m.

(d) For the purpose of paragraph (c), D is the horizontal distance the aeroplane will travel from the end of the take-off distance available.

(e) When calculating the net take-off flight path in accordance with paragraph (b), the certificate holder shall ensure that—

(1) the following factors are taken into account—

(i) take-off weight at the commencement of the take-off run; and

(ii) aerodrome elevation; and

(iii) pressure altitude at the aerodrome when the atmospheric pressure variesby more than 1% from the International Standard Atmosphere; and

(iv) ambient temperature at the aerodrome; and

(v) not more than 50% of the reported head-wind component or not less than 150% of the reported tail-wind component; and

(2) a track change exceeding 15° is not made before a height of 50 feet above the take-off surface has been achieved; and

(3) unless otherwise authorised by the Director—

(i) a bank angle exceeding 15° is not made before a height of 50 feet above the take-off surface has been achieved; and

(ii) the bank angle up to and including a height of 400 feet above the take-off surface does not exceed 20°; and

(iii) the bank angle above a height of 400 feet above the take-off surface does not exceed 25°; and

(4) allowance is made for—

(i) the effect of the bank angle on operating speeds and flight path; and

(ii) distance increments resulting from increased operating speeds; and

(iii) retention of stall margin and loss of climb gradient in accordance with 121.213.

(f) The certificate holder shall establish contingency procedures to—

(1) satisfy the requirements of this Part; and

(2) provide a safe route avoiding obstacles; and

(3) enable the aeroplane to land safely at the aerodrome of departure, or at analternate aerodrome required by 121.161.

121.213 Engine inoperative – gradient and stall corrections

A certificate holder shall, unless performance data is available, for compliance with 121.211(e)(4)(iii), retain the stall margin and calculate loss of climb gradient by applying the factors in Table 2.

Table 2

Bank angle	Speed correction	Gradient correction
15° to 19°	V2	1 x Aeroplane flight manual 15° gradient loss
20° to 24°	V2 + 5 knots	2 x Aeroplane flight manual 15° gradient loss
25°	V2 + 19 knots	3 x Aeroplane flight manual 15° gradient loss

121.215 En-route critical engine inoperative

(a) For the purposes of this rule, the en-route flight path begins where the take-off flight path finishes and continues to the point where the aircraft is 1500ft above the surface of the destination or alternate aerodrome.

(b) A certificate holder shall ensure that, for each aeroplane it operates, using the one engine inoperative en- route net flight path data—

(1) the flight path has a positive slope at an altitude of at least 1000 feet above all terrain and obstructions within, except as otherwise provided in paragraph (c), 10 nm of the intended track to be flown and at 1500 feet above the aerodrome where the landing is assumed to be made after engine failure; and

(2) the net flight path clears all terrain and obstructions within, except as otherwise provided in paragraph (c), 10 nm of the intended track by at least 2000 feet vertically; and

(3) the net flight path permits the aeroplane to continue flight from the cruising altitude to an aerodrome where a landing can be made in accordance with 121.221 or 121.223 as appropriate, taking account of—

(i) engine failure at the most critical point along the route; and

(ii) the effect of the icing protection systems if the meteorological conditions require their operation; and

(iii) the forecast ambient temperature; and

(iv) the effects of forecast wind on the flight path; and

(v) fuel jettisoning to an extent consistent with reaching the aerodrome with the required fuel reserves: and

(4) the aerodrome where the aeroplane is assumed to land after engine failure meets the following criteria—

(i) the performance requirements at the expected landing weight are met; and

(ii) weather reports and forecasts, or any combination thereof, and aerodrome condition reports indicate that a safe landing can be accomplished at the time of the intended landing.

(5) If the pilot is able, by the use of radio navigation aids or GPS, to maintain the intended track by a margin of 5 nm the distance of 10 nm required by paragraphs (b)(1) and (2) may be reduced to 5 nm.

121.217 En-route – 90-minute limitation

(a) Except as provided in paragraph (b), a certificate holder shall ensure that each aeroplane it operates with three or more engines is not more than 90 minutes away from an

aerodrome at which the performance requirements specified in the aeroplane flight manual applicable at the expected landing weight are met.

(b) The certificate holder may operate an aircraft with three or more engines more than 90 minutes away from an aerodrome at which the performance requirements specified in the aeroplane flight manual applicable at the expected landing weight are met, provided that—

(1) the two-engine inoperative en-route flight path data permits the aeroplane to continue the flight, in the expected meteorological conditions, from the pointwhere two engines are assumed to fail simultaneously, to an aerodrome at which it is possible to land using the prescribed procedure for a landing withtwo engines inoperative; and

(2) the net flight path, taking into account the effect of icing protection systems if the meteorological conditions require their operation has a positive slope clearing at an altitude of at least 2000 feet above all terrain and obstructions within, except as provided in paragraph (c), 10 nm of the intended track to be flown; and

(3) the net flight path has a positive slope at an altitude of 1500 feet above the aerodrome where the landing is assumed to be made after the failure of two engines; and

(4) the expected weight of the aeroplane at the point where the two engines are assumed to fail shall be not less than that which would include sufficient fuelto proceed to an aerodrome where the landing is assumed to be made, and to arrive there at an altitude of at least 1500 feet directly over the aerodrome and thereafter to fly level for at least 15 minutes.

(c) If the pilot is able, by the use of radio navigation aids or GPS, to maintain the intended track by a margin of 5 nm the distance of 10 nm required by paragraph (b)(2) may be reduced to 5 nm.

(d) When calculating compliance with paragraph (b), the certificate holder shall assumethe two engines fail at the most critical point of that portion of the route where the aeroplane is more than 90 minutes, at the all-engines long-range cruising speed at standard temperature and still air, away from an aerodrome at which the performance requirements applicable at the calculated landing weight are met.

121.219 Landing-climb – destination and alternate aerodromes

A certificate holder shall ensure that, for each aeroplane it operates—

(1) the landing weight of the aeroplane does not exceed the maximum approach and landing-climb weight, taking into account the altitude and the ambient temperature expected for the estimated time of landing at a destination and alternate aerodrome; and

(2) for instrument approaches with decision heights below 200 feet, the approach weight of the aeroplane, taking into account the take-off weight and the fuel expected to be consumed in flight, allows a missed approach net-climb-gradient assuming that the critical engine is inoperative in the approach configuration of—

(i) at least 2.5%; or

(ii) at least the net-climb gradient required to clear any obstacles in the missed approach

flight path in accordance with 121.211.

121.221 Landing distance – dry runways

(a) A certificate holder shall ensure that, for each aeroplane it operates, the landing weight for the estimated time of landing will not exceed the landing weight specified in the aeroplane flight manual.

(b) A certificate holder shall ensure that, for each aeroplane it operates, the landing weight for the estimated time of landing at the destination aerodrome and at any alternate aerodrome allows a full stop landing on a dry runway from a point 50 feet above the threshold within—

(1) 60% of the landing distance available at the destination and at any alternate aerodrome for a turbojet or turbofan powered aeroplane; and

(2) 70% of the landing distance available at the destination aerodrome and at any alternate aerodrome for a propeller powered aeroplane; and

(c) When calculating the landing weight in accordance with paragraph (b), thecertificate holder shall take account of—

(1) aerodrome elevation; and

(2) ambient temperature at the aerodrome; and

(3) the type of runway surface and the runway surface condition; and

(4) the runway slope in the direction of landing; and

(5) not more than 50% of the reported headwind component or not less than 150%of the reported tailwind component.

(d) The certificate holder shall, for dispatch of an aeroplane to land in accordance with paragraphs (b) and (c), assume that the aeroplane will land on the most favourable runway taking into account—

(1) the forecast meteorological conditions; and

(2) surrounding terrain; and

(3) approach and landing aids; and

(4) obstacles within the missed approach flight path.

(e) If the certificate holder is unable to comply with paragraph (d) for the destination aerodrome, the certificate holder may dispatch an aeroplane if an alternate aerodrome is designated that permits compliance with paragraphs (a), (b), and (c).

121.223 Landing distance – wet and contaminated runways

A holder of an air operator certificate must ensure that, for each aeroplane it operates—

(1) when the appropriate weather reports or forecasts, or a combination thereof, indicate that the runway at the estimated time of arrival may be wet, the landing distance available is at least 115% of the landing distance required by 121.221; and

(2) when the appropriate weather reports or forecasts, or a combination thereof, indicate that

the runway at the estimated time of arrival may be contaminated, the landing distance is at least—

(i) 115% of the landing distance required by 121.221; or

(ii) the landing distance determined in accordance with contaminated- landing- distance data.

121.225 Steep approach and short landing techniques

(a) A certificate holder may perform steep approach procedures using approach slope angles of 4.5°, or more, and with screen heights of less than 50 feet but not less than 35 feet, providing—

(1) the aeroplane flight manual states the maximum approved approach slope angle, any other limitations, procedures, including emergency procedures, forthe steep approach, as well as amendments for the field length data when using steep approach criteria; and

(2) for IFR operations, an approach slope indicator system comprising of at least a visual approach slope indicating system is available at each aerodrome at which steep approach procedures are to be conducted; and

(3) for IFR operations, weather minima are specified and approved for each runway to be used with a steep approach; and

(4) for IFR operations, consideration is given to—

(i) obstacles; and

(ii) the type of approach slope indicator reference and runway guidance such as visual aids, MLS, GPS, ILS, LLZ, VOR, or NDB; and

(iii) the minimum visual reference to be required at DH and MDA; and

(iv) usable airborne equipment; and

(v) pilot qualification and special aerodrome familiarization; and

(vi) aeroplane flight manual limitation and procedures; and

(vii) missed approach criteria.

Subpart E — Weight and Balance

121.301 Purpose

This Subpart prescribes the rules governing the control of loading and weight and balance on an aeroplane.

121.303 Goods, passenger, and baggage weights

(a) Subject to paragraphs (b), (c), and (d), a holder of an air operator certificate must ensure that for every air operation conducted under the authority of the certificate the weights of the following items that are carried on the aeroplane are established:

(1) the total actual weight of goods, excluding baggage:

(2) the total weight of passengers and their carry-on baggage:

(3) the total weight of crew members and their carry-on baggage:

(4) the total weight of checked baggage.

(b) The total weight of passengers and their carry-on baggage must be established by using only 1 of the following:

(1) the actual weight of every passenger and their carry-on baggage:

(2) a standard weight for every passenger and their carry-on baggage that is established by the certificate holder and detailed in the certificate holder's exposition:

(3) the following applicable standard weight for every passenger and their carry-on baggage:

(i) 15 kg for a child under 2 years of age:

(ii) 46 kg for a child of the age of 2 years and under the age of 13 years:

(iii) 86 kg for a person of or over the age of 13 years.

(c) The total weight of crew members and their carry-on baggage must be established by using only 1 of the following:

(1) The actual weight of every crew member and their carry-on baggage:

(2) A standard weight for every crew member and their carry-on baggage that is established by the certificate holder and detailed in the certificate holder's exposition:

(3) A standard weight of 86 kg for every crew member and their carry-on baggage.

(d) The weight of checked baggage must be established by using—

(1) the actual weight of the baggage; or

(2) for international flights originating outside of Papua New Guinea where actual weights are unable to be obtained, a standard weight that is establishedby the certificate holder and detailed in the certificate holder's exposition.

(e) A certificate holder who intends to establish a standard weight to be detailed in the certificate holder's exposition for use under paragraphs (b)(2), (c)(2), or (d)(2) must establish the respective standard weight in accordance with a survey programme that is acceptable to the Director.

(f) A certificate holder who intends to use a standard weight for passengers under paragraphs (b)(2) or (b) (3), or for crew members under paragraphs (c)(2) or (c)(3)must establish procedures that are acceptable to the Director to ensure that, if the weight of a passenger or crew member with their carry- on baggage is clearly greater than the applicable standard weight being used, a weight that is more representative of the actual weight of the person and their carry-on baggage issued.

121.305 Aeroplane load limitations

The certificate holder shall ensure that—

(1) the limitations contained in the aeroplane flight manual, or other approved document, relating to the weight and balance of an aeroplane are complied with;and

(2) maximum allowable weights are not exceeded for zero fuel, manoeuvre, take-off,and landing; and

(3) the aeroplanes centre of gravity is within the limits referred to in subparagraph (1) at departure and will remain within those limits throughout the operating cycle.

121.307 Load manifest

A holder of an air operator certificate must ensure that—

(1) a load manifest is completed before every air operation; and

(2) the load manifest is certified by the pilot-in-command; and

(3) the following details are accurately recorded on the load manifest—

(i) the name of pilot-in-command, except where this is recorded by the certificate holder in another document.

(ii) the date of the operation.

(iii) the aeroplane type and registration mark.

(iv) the name or identification of the departure and destination aerodromes.

(v) the flight number or estimated time of departure.

(vi) the surname and initial of every crew member and passenger, except where these details are recorded by the certificate holder in another document.

(vii) the total of, the aeroplanes empty weight, the weight of any removable equipment, the weight of consumables, and the weight of crew members.

(viii) the total weight of passengers and their carry-on baggage, the total weight of goods, the total weight of checked baggage, and the total weight of usable fuel.

(ix) the take-off weight of the aeroplane.

(x) evidence that the centre of gravity of the aeroplane is within the limits specified in the flight manual.

(xi) the maximum allowable weights for the operation, including zero fuel weight, take-off weight, and landing weight.

(xii) the total of any weight adjustment made under rule 121.303(f).

Subpart F — Instruments and Equipment

121.351 Purpose

This Subpart prescribes the instruments and equipment required for aeroplanes.

121.353 General

(a) A holder of an air operator certificate must ensure that an air operation does not commence unless—

(1) the aeroplane is equipped with—

(i) the type of instruments and equipment required by Part 91 and this Subpart; and

(ii) for an aeroplane that is performing a regular air transport service to, from, and within countries outside of Papua New Guinea, after 1 October 2009, an additional ELT that meets the requirements prescribed in A.15 of Appendix A to Part 91; and

(iii) the number of instruments and equipment to ensure that the failure of any independent system required for either communication or navigation

purposes, or both, will not result in the inability to communicate and navigate safely as required for the route being flown;and

(2) the instruments and equipment installed in the aeroplane comply with the specifications and airworthiness design standards listed in—

(i) Appendix A to this Part; or

(ii) Appendix B to Part 21; or

(iii) Part 26; or

(iv) alternative specifications or standards acceptable to the Director; and

(3) the instruments and equipment have been installed in accordance with the aeroplane manufacturer's instructions or other equivalent instructions acceptable to the Director; and

(4) except as may be provided by a MEL approved under rule 91.539 for use of the aeroplane, the instruments and equipment installed in the aeroplane are inoperable condition.

(b) The additional ELT required by paragraph (a)(1)(ii) may be of any type that meets the requirements prescribed in A.15 of Appendix A to Part 91 instead of the automatic ELT required by rule 91.529(a).

121.355 Additional equipment

A certificate holder shall ensure that each of its aeroplanes is equipped with—

(1) a windshield wiper or equivalent for each pilot station; and

(2) a door between the passenger and flight crew compartments, with a means of locking that prevents passengers from opening it without the flight crew's permission; and

(3) for each door that separates a passenger compartment from another compartment, except the flight crew compartment, that has emergency exit provisions—

(i) a key, readily available for each crew member; and

(ii) a placard that indicates the door must be open during take-off and landing.

(4) An emergency power supply and distribution system that –

(i) is independent of the main electrical generating system, for the purpose of operating and illuminating, for a minimum period of 30 minutes, an aeroplane attitude indicating instrument, clearly visible to the pilot-in-command; and

(ii) operates automatically after the total failure of the main electrical generating system; and

(iii) gives a clear indication on the instrument panel that the attitude indicator is being operated by emergency power.

(5) a means of indicating the adequacy of the power being supplied to required flight instruments.

121.357 Night flight

A certificate holder shall ensure that each of its aeroplanes operated at night is equipped with —

(1) two landing lights or a single landing light unit with two independent filaments; and

(2) a light providing general illumination in each passenger compartment.

121.359 Instrument flight rules

(a) Except as provided in paragraph (b), a holder of an air operator certificate must ensure that every aeroplane that is operated under IFR under the authority of the certificate is equipped with—

(1) the following that must be in addition to, and independent of, the instruments and equipment required under Subpart F of Part 91:

(i) a means of indicating airspeed, calibrated in knots, with a means of preventing malfunctioning due to either condensation or icing; or

(ii) a means of indicating sensitive pressure altitude, calibrated in feet; and

(2) spare bulbs for flight compartment instrument illumination if these bulbs can be changed in flight; and

(3) spare fuses if the aeroplane is fitted with fuses that can be changed in flight

(b) An additional means of indicating aeroplane attitude, powered by a power source that is separate from the power source for the attitude indication required under Subpart F of Part 91, may be installed in lieu of the additional means of indicatingairspeed required by paragraph (a)(1)(i).

121.361 Flights over- water

A holder of an air operator certificate must ensure that each of the certificate holder's aeroplanes configured for more than 30 passenger seats and operated over-water on flights where life rafts are required by rule 91.525 to be carried, is equipped with sufficient life rafts with buoyancy and overload capacity to accommodate every occupant of the aeroplane in the event of a loss of one raft of the largest rated capacity.

121.363 Emergency equipment

(a) A holder of an air operator certificate must ensure that an aeroplane performing an air operation under the authority of the holder's certificate is equipped with;

(1) emergency equipment referred to in rule 91.523 as applicable; and

(2) accessible adequate medical supplies acceptable to the Director.

(b) The medical supplies referred to in paragraph(a)(2) must include, as applicable:

(1) one or more first aid kits for the use of cabin crew in managing incidents of ill health; and

(2) at least one universal precaution kit for the use of cabin crew in managing incidents of ill health associated with:

(i) a suspected communicable disease; or

(ii) illness involving contact with body fluids; and

(3) for aeroplanes authorised to carry more than 250 passengers, two universal precaution kits of the type referred to in paragraph (b)(2); and

(4) for aeroplanes authorised to carry more than 100 passengers, on a sector length of more than two hours, at least one emergency medical kit for the use of medical doctors or other suitably qualified persons in treating inflight medical emergencies.

121.365 Protective breathing equipment

A holder of an air operator certificate holder must ensure that each aeroplane that is operated under the authority of the certificate is equipped with protective breathing equipment that—

(1) is conveniently located and easily accessible to each-

(i) flight crew member at his or her normally seated position; and

(ii) crew member; and

(2) is installed—

(i) on the flight deck; and

(ii) in each passenger compartment within 1 metre of each required handheld fire extinguisher or at some distance acceptable to the Director; and

(iii) in a galley that contains a hand held fire extinguishers; and

(iv) outside each Class A, B and E cargo compartment in the immediate vicinity of the point of access to the compartment.

121.367 Public address and crew member intercom systems

A certificate holder shall ensure that each of its aeroplanes is equipped with—

(1) a public address system; and

(2) a crew member intercom system.

121.369 Cockpit voice recorder

(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 cockpit 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.

121.371 Flight data recorder

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.

121.373 Additional attitude indicator

A certificate holder shall ensure that each of its turbine powered aeroplanes is equipped witha third presentation of attitude.

121.375 Weather radar

A certificate holder shall ensure that each of its turbine powered aeroplanes operating under IFR is equipped with a weather radar.

121.377 Ground proximity warning system

(a) Except as provided for in paragraph (b), a holder of an air operator certificate must ensure that a turbine powered aeroplane operated under that certificate is equipped with GPWS

which has a forward-looking terrain avoidance function;

(b) the holder of an air operator certificate is not required to comply with paragraph (a)if the aeroplane is fitted with a TAWS Class A;

(c) the holder of an air operator certificate must implement database management procedures that ensure the timely distribution and update of current terrain and obstacle data to the ground proximity warning system.

121.379 Terrain awareness warning system (TAWS)

(a) A holder of an air operator certificate must ensure that a turbine-powered aeroplane operated under that certificate which is certificated for more than 30 passengers is equipped with TAWS Class A.

(b) A holder of an air operator certificate must ensure that a piston aeroplane operated under that certificate which is certificated for more than 30 passengers is equippedwith a TAWS Class B.

121.381 Airborne collision avoidance system (ACAS II)

A holder of an air operator certificate must ensure that a turbine-powered aeroplane operated under that certificate which is certificated for more than 19 passengers is equipped with ACAS II Version 7.1.

121.383 Data link recorders

A holder of an air operator certificate must ensure that all aeroplanes –

(1) for which the individual certificate of airworthiness is first issued on or after 1 January 2016, which use any of the data link communications applications prescribed in A.12 of Appendix A and are required to carry a CVR, must record ona flight recorder the data link communications messages on a FDR, CVR or DLR.

(2) which are modified on or after 1 January 2016 to install and use any of the data link communications applications prescribed in A.12 of Appendix A and are required to carry a CVR must record the data link communications messages on a FDR, CVR or DLR unless –

(i) the installed data link communications equipment is compliant with a type certificate issue; or

(ii) aircraft modification first approved prior to 1 January 2016.

121.385 Runway Overrun Awareness and Alerting System

A holder of an air operator certificate must ensure that all turbine-engine aeroplanes of a maximum certificated take-off mass in excess of 5 700 kg, for which the individual certificate of airworthiness is first issued on or after 1 January 2026, shall be equipped with a runway overrun awareness and alerting system (ROAAS) as acceptable to the Director.

Subpart G —Maintenance

121.401 Purpose

This Subpart prescribes rules for maintenance of aeroplanes operated under this Part.

121.403 Responsibility for airworthiness

(a) A holder of an air operator certificate is responsible for the airworthiness of –

(1) every aeroplane that is operated under the authority of the certificate; and

(2) any equipment installed or attached to the aeroplane.

(b) A holder of an air operator certificate must ensure that –

(1) every aeroplane that is operated under the authority of the certificate is maintained in accordance with the maintenance programme required under rule 119.63; and

(2) the maintenance is performed by–

(i) a maintenance organisation certificated in accordance with Part 145; or

(ii) for maintenance that is performed in another State that is party to a technical arrangement, a maintenance organisation that is certificated or appropriately authorised by the State to perform maintenance on the aircraft type in accordance with the conditions specified in the technical arrangement.

121.405 Condition monitored maintenance programmes

A holder of an air operator certificate who utilises condition monitoring as part of a maintenance programme for an aeroplane must provide the Director, each month, with maintenance reliability report that contains details of—

(1) aeroplane utilization; and

(2) a pilot report regarding aeroplane airworthiness; and

(3) aeroplane mechanical delay and flight cancellation; and

(4) unscheduled engine shutdown; and

(5) unscheduled engine removal; and

(6) unscheduled component removal; and

(7) confirmed component failure; and

(8) an incident regarding aeroplane airworthiness; and

(9) MEL usage.

121.407 Aircraft airworthiness review

(a) A holder of an air operator certificate may certify completion of an aircraft airworthiness review required by rule 91.615 on the basis of a continuing compliance assurance programme if—

(1) the programme samples every requirement of rule 43.153(a) during the review period of 365 consecutive days; and

(2) the operator's exposition required under rule 119.75 contains procedures acceptable to the Director for conducting the continuing assurance programme; and

(3) the operator maintains records of every sample taken; and

(4) the airworthiness review is individually certified for each of the certificate holder's aeroplanes.

(b) The holder of an air operator certificate must ensure that the person certifying completion of an airworthiness review carried out under paragraph (a)—

(1) confirms that the records required by paragraph (a) (3) provide evidence of compliance with paragraph (a)(1); and

(2) identifies in the statement of certification the sampling period over which there view is deemed to have been completed; and

(3) enters the following statement in the appropriate maintenance aircraft logbook or other approved technical record:

"I hereby certify that an airworthiness review has been completed out on this aircraft for the period in accordance with the continuingcompliance assurance programme requirements of the Papua New Guinea Civil Aviation Rules 121.407"; and

(4) adjacent to the statement required by paragraph (b)(3), enters:

(i) the person's name; and

(ii) the person's signature, except if the maintenance logbook is in electronic format; and

(iii) the person's inspection authorisation number, and

(iv) the date that the review was completed; and

(v) is independent of any direct involvement in the control of airworthiness of the aircraft under review.

(c) The procedures required by paragraph (a)(2) must include the means whereby the continuing compliance assurance programme sampling is recommenced following certification of a completed review in accordance with paragraph (b).

(d) Notwithstanding rule 43.151, a person certifying completion of an aircraft airworthiness review under paragraph (b) maybe a person authorised for the purpose by the holder of the air operator certificate if–

(1) the person has qualifications that are at least equivalent to those of the holder of an inspection authorisation issued under Part 66 in respect to aircraft conformity and type design; and

(2) the person has experience in the control of airworthiness and the conduct of maintenance on that type of aircraft.

121.409 Maintenance Elements for EDTO

(a) Subject to paragraphs (b), (c), (d), and (e), a holder of an air operator certificate who is authorised to operate an aeroplane with 2 turbine powered engines on an EDTO must ensure that the maintenance programme required by rule 119.61 includes, for every aeroplane authorised for use on an EDTO—

(1) the inspection and maintenance requirements specified in the CMP or type design document for the airframe and engine combination; and

(2) an EDTO pre-departure service check that must be completed immediately before the aeroplane is dispatched on an EDTO to—

(i) verify the serviceable status of the aeroplane including every EDTO significant system; and

(ii) verify that oil levels for each engine, and APU if an APU is required foran EDTO, are within the acceptable limits; and

(3) a schedule of maintenance activities that are required to be performed on an EDTO significant system on a scheduled basis; and

(4) procedures for performing maintenance on an EDTO significant system; and

(5) procedures for performing multiple identical system maintenance; and

(6) an engine condition monitoring programme; and

(7) an engine oil consumption monitoring programme for each engine, and APU if an APU is required for an EDTO, that includes an alert procedure if any individual uplift of oil for an engine or APU exceeds the manufacturer's recommendations; and

(8) if APU in-flight start capability is required for an EDTO, a cold soak in-flight APU start and run reliability programme; and

(9) an EDTO significant system list; and

(10) a parts control programme for ensuring—

(i) that the aeroplane continues to conform with the type certification standard; and

(ii) the proper identification of parts to maintain the airframe/engine configuration for the authorized EDTO.

(b) The schedule of maintenance activities required by paragraph (a)(3) for the maintenance of EDTO significant systems must not schedule any multiple identical system maintenance to be performed on an aeroplane during any period of scheduled maintenance except where multiple identical system maintenance—

(1) cannot be avoided; or

(2) is required for the performance of an EDTO pre-departure service check required by paragraph (a)(2).

(c) The procedures required by paragraph (a)(4) for performing maintenance onan EDTO significant system must include—

(1) a means for verifying that the aeroplane is serviceable for an EDTO after the performance of maintenance on an EDTO significant system; and

(2) if the requirements of paragraph (1) cannot be met with ground-based test procedures, an EDTO verification flight.

(d) If any maintenance performed on an aeroplane that is authorised for use on an EDTO requires the disturbance of a multiple identical system, that maintenance must be performed in accordance with the multiple identical system maintenance procedures required by paragraph (a)(5).

(e) The procedures required by paragraph (a)(5) for multiple identical system maintenance must include requirements for—

(1) a separate, appropriately authorised person to perform the maintenance actionon each of the identical EDTO significant systems; and

(2) another appropriately authorised person to perform an independent physical check of the maintenance performed by the person required by paragraph (e)(1); and

(3) on completion of the maintenance, —

(i) testing of the systems in accordance with the maintenance manual and any applicable modification instructions; and

(ii) ground testing to verify that the aeroplane is serviceable for EDTO; and

(iii) an EDTO verification flight to be completed if ground testing under paragraph (ii) cannot positively verify that the aeroplane is serviceable for EDTO.

121.411 EDTO Quarterly Report

A holder of an air operator certificate who is authorised to conduct an EDTO must, before the 21st day of the following quarter, provide a summary report to the Director of the following for the preceding 3 months of EDTO:

(1) every operation and utilisation of an aeroplane authorised for use on an EDTO:

(2) every engine operation and utilisation on an aeroplane conducting an EDTO:

(3) every interruption, delay or cancellation of an EDTO due to a technical reason:

(4) every unscheduled termination or diversion from an EDTO route caused by an actual or suspected technical malfunction:

(5) IFSD rates and events:

(6) every event where there is an inability to control the engine or obtain the desired power:

(7) every event where there is a precautionary thrust reduction (except for normal troubleshooting as allowed in the flight manual:

(8) every event where there is a degraded propulsion in-flight start capability:

(9) every incident that is associated with an aeroplane authorised for use on an EDTO and is required by rule 12.55(e) to be notified to the Authority within 72 hours of the incident occurring:

(10) any system defect summary report where the EDTO significant system defect rate exceeds the alert level established by the certificate holder:

(11) every usage of a minimum equipment list for EDTO significant systems:

(12) every unscheduled removal of an EDTO significant system component from an aeroplane.

Subpart H — Crew Member Requirements

121.501 Purpose

This Subpart prescribes the rules governing the use of flight crew members, cabin crew, and other crew member

121.503 Flight crew qualification and assignment of duty

(a) The certificate holder shall not assign a person to act as a flight crew member, nor shall a person act as a flight crew member, on an air operation, unless that person is—

(1) the holder of an applicable and current licence and rating issued under Part 61 or 63 authorising the holder to perform that air operation; and

(2) currently qualified in accordance with the requirements of Subpart I; and

(3) currently competent in accordance with Subpart J.

(b) The certificate holder shall designate, for each period of an air operation—

(1) a pilot-in-command; and

(2) a second-in-command when more than two pilots are required; and

(3) any other flight crew member that may be required by the type of operation to be performed to augment the minimum crew specified in the aeroplane flight manual.

(c) The certificate holder shall not require any crew member to perform any duties during critical phases of flight except those duties required for the safe operation ofthe aeroplane.

(d) The critical phases of flight referred to in paragraph (e) include—

(1) for flight crew members, all operations involving push back, taxi, take-off, approach and landing, and all other air operations conducted below 10 000 feet, except in cruise flight; and

(2) for crew members, all ground operations after leaving the apron area to join a main taxiway, take- off until passing 1000 feet on climb, and all flight below 5000 feet on the landing approach phase of the flight.

(e) The certificate holder shall, for each aeroplane type operated, assign in writing, to all operating crew members, the operational and safety functions they are to perform.

(f) A person acting as a flight crew member on an air operation outside Papua New Guinea shall have in their possession the licence required by paragraph (a).

121.505 Pilot-in-command experience requirements

The certificate holder must not designate a pilot to act as pilot-in-command of an aeroplane conducting an air operation under the authority of the certificate unless the pilot:

(1) holds a current airline transport pilot licence (aeroplane) with an applicable aircraft type rating; and

(2) holds a current instrument rating; and

(3) has successfully completed the applicable training and competency requirements specified in Subparts I and J, or is participating in, and is assessed as competent in accordance with an advanced qualification programme specified in Subpart M; and

(4) has at least 1500 hours of flight time experience as a pilot, including:

(i) 500 hours in the type of operations to which this Part applies or in equivalent operations that are acceptable to the Director; and

(ii) 100 hours of instrument time at least 50 hours of which is acquired in actual flight; and

(iii) 100 hours of night-flight time if designated as pilot-in-command for flights at night.

121.507 Second-in-command experience

The certificate holder shall ensure that any person designated as second-in-command of an air operation—

(1) holds at least a current commercial pilot licence (aeroplane) with an applicable aircraft type rating; and

(2) holds a current instrument rating; and

(3) has successfully completed—

(i) the applicable training and competency requirements specified in Subparts I and J, or is participating in, and is assessed as competent in accordance with an advanced qualification programme specified in Subpart M; or

(ii) the applicable introduction, transition, or upgrade segment of the flight crew member training programme required by Subpart I and is assessed as competent for the flight crew member position under Subpart J, and is completing the pilot line training or pilot consolidation referred to in rules 121.567 or 121.569; and

(4) is capable, in the event of the pilot-in-command being incapacitated—

(i) of operating the aeroplane safely under the prevailing and anticipated forecast weather conditions; and

(ii) of performing the functions of the pilot-in-command; and

(iii) of landing the aeroplane at the intended destination aerodrome or a suitable alternate aerodrome.

121.509 Cruise Relief Pilot experience

(a) A holder of an air operator certificate must not designate a pilot to act as cruise relief pilot conducting an air operation under the authority of the certificate unless the pilot—

(1) holds at least a current commercial pilot licence (aeroplane) with an applicable aircraft type rating; and

(2) holds a current instrument rating; and

(3) has completed the applicable training and competency requirements specified in Subparts I and J; and

(4) is capable of operating the aeroplane safely in the cruise phase referred to in rule 121.533(b) until—

(i) the second-in-command is summoned to the flight deck, if the pilot-in-command becomes incapacitated; or

(ii) the pilot-in-command is summoned to the flight deck, if the second-in-command becomes incapacitated.

121.511 Pilot operating limitations

(a) The certificate holder shall ensure that, subject to paragraph (b), the pilot-in- command conducts each take-off and each landing.

(b) A pilot other than the pilot-in-command of an aeroplane performing an air operationmay conduct the take-off and landing if—

(1) the certificate holder has established a method of categorizing aerodromes interms of operational difficulty and demand on the operating crew demand; and

(2) if necessary, established limitations and experience requirements to be met by a pilot other than the pilot-in-command.

(c) If a cruise relief pilot is designated for an air operation under rule 121.509, the holder of the air operator certificate must ensure that the cruise relief pilot does notoccupy a flight crew seat—

(1) at any time when the aeroplane is operating below FL200 or below the transition level, whichever is higher; or

(2) at any other time during the flight unless the other flight crew seat is occupied by a pilot who is—

(i) the pilot-in-command; or

(ii) designated by the pilot-in-command and qualified by the holder to act as pilot-in- command in the cruise phase of the flight while supervising a cruise relief pilot.

(d) The procedures required by paragraph (b) must be based on risk management principles and take into account—

(1) pilot-in-command qualifications:

(2) pilot training and experience:

(3) aircraft status and performance:

(4) runway dimensions and conditions:

(5) cloud ceiling:

(6) prevailing visibility:

(7) crosswind component.

121.513 Category II or III approaches and reduced take-off minimaqualifications

(a) The certificate holder shall ensure that Category II or III precision approaches, and departures with reduced take-off minima, are conducted with both the pilot-in- command and second-in-command qualified for such approaches and departures.

(b) For the purpose of paragraph (a)—

(1) where the pilot-in-command is qualified only as the pilot flying, the pilot-in-command shall conduct all Category II and III precision approaches and departures as the pilot flying; and

(2) where the second-in-command is qualified only as the pilot non-flying, the pilot-in- command shall conduct all Category II and III precision approaches and departures as the pilot flying.

121.515 Pilot operational and age limitations

(a) A holder of an air operator certificate must, after the applicable training requirements of Subpart I are completed, ensure that for each air operation no morethan one pilot of an operating flight crew has, in the aeroplane type used—

(1) accumulated less than an additional 75 hours in the type of operations to which this Part applies; or

(2) completed less than 75 operating cycles in the type of operations to which this Part applies.

(b) No person shall act as pilot of an aircraft engaged in international commercial air transport operations if that person has attained his 60th birthday or, in the case of operations with more than one pilot, his 65th birthday; and

(c) For aircraft engaged in domestic commercial air transport operations crewed by more than one pilot, where the pilot has attained his 60th birthday, the holder of the air operator certificate must ensure the other pilot is below the age of 60 years.

121.517 Cabin Crew duty assignment

(a) A holder of an air operator certificate must ensure the certificate holder's aeroplanes are operated with at least the minimum number of cabin crew carried as crew members—

(1) specified by the manufacturer's recommended emergency evacuation procedures for the aeroplane configuration being used; and

(2) specified by the certified design criteria for the aeroplane; and

(3) that will ensure at least one cabin crew is present in each occupied compartment; and

(4) in accordance with the minimum number specified in Table 3.

Table 3. Required cabin crew

Aeroplane Passenger Capacity:	Cabin Crew required
20 through 50	1
51 through 100	2
101 through 150	3
151 through 200	4
201 through 250	6
251 through 300	7
301 through 350	9
351 through 400	10
401 through 450	11
451 through 500	12
for each further 50 passengers	1

(b) The certificate holder must designate—

(1) for each air operation requiring two or more cabin crew members, a senior cabin crew member responsible to the pilot-in-command for the operational and safety

functions of each cabin crew member; and

(2) for each air operation requiring six or more cabin crew members, a deputy senior cabin crew member.

(c) Notwithstanding the requirements of paragraph (a)(4), one less cabin crew member than that specified in Table 3 may be carried to allow the continuation of an air operation in the event a required cabin crew becomes unfit because of sickness or injury during their duty period, provided—

(1) the requirements of paragraphs (a)(1), (2), and (3) can be met; and

(2) the remaining cabin crew are trained and competent to operate safely with the reduced number of cabin crew in accordance with the procedures specified in the certificate holder's exposition; and

(3) numbers are restored to comply with the requirements of paragraph (a)(4) at the first aerodrome of landing where a replacement would normally be expected to be available.

121.519 Crew member health and safety

A holder of an air operator certificate must establish procedures to ensure that meals consumed by a crew member during a period of duty do not result in the impairment of thecrew member to perform assigned duties.

Subpart I - Training

121.551 Purpose

This Subpart prescribes rules governing the establishment and operation of a training programme for crew members

121.553 Training programme

(a) The certificate holder shall establish a training programme in accordance with this Subpart to qualify each of its crew members.

(b) The certificate holder shall establish a training programme to ensure that each assigned crew member is trained and competent to perform their assigned duties.

(c) The certificate holder shall ensure that the training programme is conducted safely and without unacceptable risk to the equipment and personnel, or third parties.

(d) The certificate holder shall ensure the training programme contains segments for—

(1) introduction training; and

(2) transition training; and

(3) upgrade training; and

(4) recurrent training.

(e) The certificate holder shall ensure that each segment required by paragraph (d) includes a syllabus that is acceptable to the Director.

(f) The certificate holder shall ensure that its syllabus provides for consolidation in accordance with 121.567.

(g) The certificate holder shall ensure that the person responsible for its training

programme meets the requirements of 121.583.

(h) The certificate holder must ensure that:

(1) its training programme required by paragraph (a) is controlled; and

(2) is approved by the Director.

(i) The certificate holder may—

(1) conduct the training programme; or

(2) contract with the holder of an aviation training organisation certificate issued under Part 141, to conduct the training programme where the Part 141certificate authorises the holder to conduct that training: or

(3) for a training programme conducted outside Papua New Guinea, contract with an organisation that meets an equivalent standard specified by Part 141.

(j) The certificate holder must record each separate crew member qualification and inform the crew member involved in writing of the qualification gained.

(k) The certificate holder must ensure that the person responsible for its cabin crew training programme is qualified as specified in rule 121.591, or rule 121.593, or rule 121.595, or has appropriate qualifications and experience that is acceptable tothe Director.

121.555 Training equipment

(a) The certificate holder shall ensure that the crew member training programme includes both ground and flight instruction using—

(1) training devices; and

(2) if required under 121.579, a flight simulator appropriate for the aeroplane type.

(b) The certificate holder shall ensure that each flight simulator and each training device that is used in its training programme:

(1) approved for use by the certificate holder; and

(2) approved for the aeroplane type, and if applicable, the particular variant within that type, for which the training or check is being conducted; and

(3) approved for the particular manoeuvre, procedure, or crew member function involved; and

(4) specified in the exposition required by rule 119.75.

(c) When conducting training that requires equipment or resources that are not used solely for training, the certificate holder shall ensure that sufficient access is available to the equipment or resources to enable the training to be completed—

(1) without unplanned interruption; and

(2) in an environment that is conducive to the objective and safety of the task.

(d) The certificate holder must ensure that any flight simulator or training device used for flight training in the training programme, —

(1) maintains the performance, functional, and other characteristics that are required for approval; and

(2) is modified to conform with any modification to the aeroplane being simulated that results in changes to performance, functional, or other characteristics required

for approval; and

(3) is given a functional pre-flight check before being used, and any discrepancy detected during use is logged by the appropriate pilot instructor or flight examiner at the end of each training or flight assessment.

(e) The certificate holder must ensure that for each aeroplane type operated under the authority of the certificate, a flight simulator and training device for that aeroplane type is used for the crew training components of the training programme.

(f) Despite paragraph (e), if a flight simulator and training device for a particular aeroplane type is not available, the certificate holder may apply to the Director to amend the training programme to conduct training in an aeroplane.

(g) The certificate holder must ensure that training conducted in an aeroplane referred to in paragraph (f) is carried out in accordance with a safe flight practice guide that is acceptable to the Director.

121.557 Syllabus for crew member training programme

(a) Each segment of the crew member programme must include a syllabus that is applicable to the certificate holder's operations and is acceptable to the Director.

(b) Each syllabus required by paragraph (a) must include, at least the following elements as applicable to:

(1) the aeroplane type to be used, including special equipment fitted for the intended operation.

(2) the routes and aerodromes appropriate to the intended operation.

(3) crew member assignments, functions, and responsibilities.

(4) location and operation of emergency equipment available for use by crew members.

(5) location and use of oxygen equipment.

(6) location and use of all normal and emergency exits, including evacuation slides and escape ropes.

(7) the certificate holder's policies and procedures appropriate to its air operations.

(8) training in all types of emergency and abnormal situations or procedures caused by power plant, airframe or system malfunctions, fire or other abnormalities:

(9) include upset prevention and recovery training.

(10) training on human factors and crew resource management:

(11) training in strategies to manage risks including threat and error management:

(12) the requirements of Part 92 regarding the carriage of dangerous goods:

(13) security training in accordance with the air operator security programme required by rule 119.69:

(14) evidence based training (EBT):

(15) training on airborne collision avoidance system (ACAS):

(16) instructions and training on the avoidance of controlled flight into terrain (CFIT):

(17) training on policy and use of ground proximity warning system (GPWS).

(18) training on continuous descent final approach (CDFA) including stabilised approach criteria:

(19) training on performance-based navigation (PBN):

(c) If a holder of an air operator certificate is unable to present or sustain the aircraft flight or systems operations functions of the training programme using an aeroplane in a manner acceptable to the Director, the holder of the certificate must use a flight simulator for all or part of the training programme.

121.559 Crew member introduction segment

(a) The certificate holder shall ensure that each crew member who is not qualified and currently serving as a crew member in an operation authorised by the certificate holder's certificate, completes the introduction segment of its training programme—

(1) in a structured manner; and

(2) in accordance with the syllabus required by 121.557.

(b) The certificate holder may vary the syllabus required by 121.557 for individual crew members if—

(1) the varied training is recorded in the crew member's record of training; and

(2) the certificate holder certifies the variation made and the reasons for the variation in the crew member's record of training.

(c) The certificate holder must ensure that the introduction segment of the training programme includes training on human factors, and crew resource management.

(d) A pilot may not commence an introduction segment of the training programme under paragraph (a) unless the pilot—

(1) has acquired at least 500 hours of flight time experience as pilot; or

(2) completes the certificate holder's airline pilot training programme acceptable to the Director; and

(3) holds a current instrument rating; and

(4) has acquired at least 25 hours of night flight time experience as pilot.

(e) The Director may accept a lesser minimum flight time experience than that required by 121.559(d)(1) subject to the pilot completing an enhanced introductory training programme and undergoing an increased level of competency assessment.

121.561 Crew member transition segment

(a) The certificate holder shall ensure that personnel already qualified and serving ascrew members on an air operation authorised by the certificate holder's certificate, completes the transition segment of its training programme in accordance with the syllabus required by 121.557 if—

(1) the crew member is changing from one aeroplane type or variant to another type or variant: or

(2) new procedures or equipment are introduced on an existing aeroplane type or

variant.

(b) The transition segment shall address—

(1) the use of all safety and emergency equipment and procedures applicable to the aeroplane type or variant; and

(2) new procedures or equipment introduced on the existing aeroplane type or variant; and

(3) any required human factors and crew resource management training brought about by the different aeroplane, equipment, or procedures.

121.563 Crew member upgrade segment

(a) The certificate holder shall ensure that each of its crew members completes the upgrade segment of its training programme in accordance with the syllabus required by 121.557, if the crew member is changing from one crew position to a more responsible crew position on the same aeroplane type or variant.

(b) The certificate holder shall ensure its upgrade segment addresses the use of all safety and emergency equipment and procedures applicable to the crew position on the aeroplane for which the upgrade is sought and shall—

(1) include training on human factors, and crew resource management, with particular emphasis on the changes brought about by the different crew position; and

(2) include training in supervisory skills.

121.565 Crew member recurrent segment

(a) The certificate holder shall ensure that each of its crew members are adequately trained, current, and proficient for each aeroplane, crew member position, and type of operation, in which the crew member serves.

(b) The certificate holder shall ensure that each crew member completes the recurrent segment of its training programme—

(1) in a structured manner; and

(2) in accordance with the syllabus required by 121.557; and

(3) for a flight crew member twice in each calendar year at intervals of not less than four months.

(c) The certificate holder shall ensure that each crew member completes the recurrent segment of its training programme —

(1) in a structured manner; and

(2) in accordance with the syllabus required by 121.557; and

(3) for a flight crew member, twice in each calendar year at intervals of not less than four months; and

(4) for a cabin crew member, conducted annually at intervals not exceeding 12 calendar months

(d) The certificate holder must ensure that the recurrent segment of the training programme addresses training on human factors and crew resource management.

121.567 Consolidation segment

The certificate holder shall ensure, after each crew member completes an introduction, transition, or upgrade, segment of its training programme the crew member undergoes consolidation by acquiring—

(a) the appropriate operating experience—

(1) for a pilot, required by 121.569; and

(2) for a cabin crew member, required by 121.577; and

(b) the appropriate line-operating flight time—

(1) for a pilot, required by 121.571; and

(2) for a flight engineer, required by 121.573.

121.569 Pilot operating experience

(a) The certificate holder shall ensure that each person performing the functions of a pilot holds the licences and ratings required to be held under Part 61 and has completed, on the make and basic model aeroplane and in the crew member position that the person will serve in, the following operating experience as applicable:

(1) for the introduction segment—

(i) for multi-engine, turbine powered aeroplanes – 20 hours and 10 take-offs and landings; and

(ii) for turbojet and turbofan powered aeroplanes – 25 hours and 10 take-offs and landings; and

(iii) for all aeroplanes, including those referred to in paragraphs (a)(1)(i) and (ii) — four operating cycles of which at least two must be as the pilot flying:

(2) for the transition or upgrade segment—

(i) for multi-engine, turbine powered aeroplanes – 12 hours and 8 take-offs and landings; and

(ii) for turbojet and turbofan powered aeroplanes – 20 hours and 10 take-offs and landings for pilot-in-command, or 10 hours and 8 take-offs and landings for second-in-command; and

(iii) for all aeroplanes, including those referred to in paragraphs (a)(2)(i) and (ii) — four operating cycles of which at least two must be as the pilot flying.

(b) The operating experience required by paragraph (a) shall be acquired on the appropriate aeroplane type as follows—

(1) after satisfactory completion of the appropriate ground and flight training for the aeroplane type and crew member position in accordance with Part 61; and

(2) under the supervision of an instructor who meets the requirements in 121.585;and

(3) under air operations—

(i) simulated in a flight simulator for the aeroplane type; or

(ii) conducted in the aeroplane type.

(c) Any time accrued in a flight simulator under paragraph (b)(3)(i) may be multiplied by 1.30 for the purpose of calculating the total time required to satisfy paragraph (a), provided that—

(1) any procedures and manoeuvres not approved for completion in the simulator have been conducted in the appropriate aeroplane; and

(2) the pilot has demonstrated proficiency in all procedures, including emergency procedures, and manoeuvres specified by the training programme; and

(3) the pilot has satisfactorily completed the appropriate training phases for that aeroplane and crew member position.

(d) For the purpose of paragraph (b)(3)(ii) the instructor shall—

(1) act as pilot-in-command at all times; and

(2) occupy a pilot station when supervising a pilot acquiring the experience necessary for a pilot-in- command position, until the qualifying pilot has—

(i) made at least two take-offs and landings in the aeroplane type for which the pilot-in- command qualification is required; and

(ii) demonstrated to the instructor the ability to perform the duties of a pilot-in-command for that aeroplane type; and

(iii) if the qualifying pilot-in-command is completing introduction or upgrade training, demonstrated to a flight examiner the ability to satisfactorily perform the prescribed duties during at least one complete operating cycle.

(e) The instructor may occupy the observer's seat upon the requirements of paragraph(d)(2) being met.

121.571 Pilot line-operating flight time

(a) The certificate holder shall ensure that after each pilot completes an introduction or transition segment of its training programme, the pilot completes the line-operating flight time required by paragraph under the supervision of an instructor who meets the requirements in 121.587.

(b) The combined total of introduction flight time, line-operating flight time and the operating experience required by 121.567 shall be—

(1) at least 100 hours of flight time, or 50 operating cycles, for consolidation; and

(2) completed within 120 days from completing the introduction or transition segment, with a maximum extension of 30 days if the pilot—

(i) continues to meet all other requirements of the training programme; and

(ii) satisfactorily completes and passes either a refresher course acceptable to the Director, or a supervised line-operating flight, conducted by an instructor or flight examiner, on or before the 120th day.

(c) The pilot shall operate exclusively on the appropriate aeroplane type while completing line- operating flight time experience unless refresher training that is acceptable to the Director is provided and satisfactorily passed.

121.573 Flight engineer line-operating flight time

(a) The certificate holder shall ensure that each person performing the functions of a cadet flight engineer or flight engineer holds the licences and ratings required to beheld under Part 63.

(b) The certificate holder shall ensure that, within 120 days of a cadet flight engineer being rated, for consolidation, that flight engineer completes at least 100 hours of flight time or 75 operating cycles performing the functions of a flight engineer.

(c) The consolidation required by paragraph (b) may be extended by 30 days if the flight engineer satisfactorily completes and passes either a refresher course acceptable to the Director, or a supervised line- operating flight, conducted by a person approved for that purpose, on or before the 120th day.

(d) The flight engineer shall operate exclusively on the appropriate aeroplane type while completing line- operating flight time experience unless refresher training that is acceptable to the Director is provided and satisfactorily passed.

121. 575 Cabin Crew training programme

(a) A holder of an air operator certificate must ensure that a person performing the functions of a cabin crew member on an air operation has satisfactorily completed the appropriate ground and flight training for the aeroplane type on which the cabincrew member is to perform duties and for the crew member position designated.

(b) The cabin crew member training required by paragraph (a) must ensure that each person is —

(1) aware of the authority structure of the aeroplane crew members; and

(2) competent to execute those safety duties and functions which the cabin crew member is assigned to perform in the event of an emergency or in a situation requiring emergency evacuation.

(3) drilled and capable in the use of emergency and life-saving equipment required to be carried, such as life jackets, life rafts, evacuation slides, emergency exits, portable fire extinguishers, oxygen equipment, first-aid anduniversal precaution kits, and automated external defibrillators.

(4) competent to carry out procedures for passenger handling, including-

(i) procedures to be followed in dealing with special classes of passengers according to the certificate holder’s exposition; and

(ii) procedures to be followed in handling passengers whose conduct might jeopardize safety; and

(iii) procedures for seating and evacuation of persons who might need assistance; and

(5) competent on the procedures for briefing of passengers; and

(6) when serving on aeroplanes operated above 10,000 feet, knowledgeable as regards the effect of lack of oxygen and, in the case of pressurized aeroplanes, as regards physiological phenomena accompanying a loss of pressurisation; and

(7) aware of other crew members’ assignments and functions in the event of an emergency so far as is necessary for the fulfilment of the cabin crew member’s

own duties; and

(8) aware of the types of dangerous goods which may, and may not, be carried in a passenger cabin; and

(9) knowledgeable about human performance as related to passenger cabin safety duties including flight crew-cabin crew coordination; and

(10) drilled and capable in the use of cabin health and first aid in accordance with ICAO Doc 10002 Cabin Crew Safety Training Manual, Chapter 9:

(11) Knowledgeable on the Civil Aviation Rules and supporting documentation; and

(12) Knowledgeable on the certificate holder's documentation and procedures.

121.577 Cabin crew operating experience

(a) The certificate holder shall ensure that each person performing the functions of a cabin crew—

(1) has completed the crew member training for cabin crew required by 121.575;and

(2) has completed, on the make and basic model aeroplane, and in the crew member position that the person will serve in, for the introduction or transition training segment of its training programme, five hours' line-operating flight time including at least two operating cycles.

(b) For the purpose of paragraph (a)(2), up to 2.5 hours of the required line-operating flight time may be conducted in a full scale, type-specific, cabin training device.

(c) The operating experience required by paragraph (a) shall be acquired—

(1) after satisfactory completion of the appropriate ground training for the aeroplane and crew member position in accordance with a syllabus acceptable to the Director; and

(2) under the supervision of an appropriately qualified trainer of cabin crew who has experience acceptable to the Director.

121.579 Manoeuvres requiring a flight simulator

The certificate holder shall ensure a flight simulator is used where a non-normal or emergency manoeuvre is to be conducted during training, practice, or a competency check that—

(1) if mishandled, would create an unacceptable risk to the aeroplane, crew members, or third parties; or

(2) involves the need to fail any system for training that cannot be readily failed in the aeroplane without an unacceptable risk to the aeroplane, crew members, or third parties: or

(3) involves actions necessary to complete any procedures required by 121.73(d)(4) that cannot be realistically carried out in an aeroplane.

121.581 Crew members training records

The certificate holder shall maintain records of all required training and consolidation undertaken by its crew members.

121.583 Pilot flight examiner requirements

The certificate holder shall ensure that each person performing the functions of an aeroplane or simulator flight-examiner, for an aeroplane type, in an operational competency assessment programme that is established under this Part—

(1) has satisfactorily completed the appropriate competency checks required to serve as pilot-in-command in air operations in the aeroplane type; and is—

(i) the holder of an appropriate and current flight examiner rating; or

(ii) a person approved for that purpose; and

(2) has acquired

(i) 200 hours exercising the privileges of a flight instructor for the particular aeroplane type involved; or

(ii) 100 hours exercising the privileges of a flight examiner rating on another aeroplane type to which this Part applies; and

(3) has completed a training course in the methods for assessing crew member competency in the technical and non-technical aspects of aircraft operation including human factors and crew resource management

121.585 Pilot instructor requirements

The certificate holder shall ensure that each person performing the functions of an aeroplane or simulator instructor in a pilot training programme that is established under this Part—

(1) has satisfactorily completed the appropriate training required to serve as pilot-in-command in air operations in the aeroplane type; and is—

(i) the holder of an appropriate and current flight instructor rating; or

(ii) a person approved for that purpose; and

(2) has acquired at least 3000 hours of flight time as a pilot, including—

(i) 500 hours' line-operating flight time experience for the particular aeroplane type involved; or

(ii) 100 hours exercising the privileges of a flight instructor rating instructing pilots on another aeroplane type to which this Subpart applies; and

(3) has completed a training course in the methods for assessing crew member competency in the technical and non-technical aspects of aircraft operation including human factors and crew resource management.

121.587 Pilot instructor supervisor requirements

(a) The certificate holder shall ensure that supervisory functions in a pilot training programme established under this Part are performed by an aeroplane or simulator instructor.

(b) The certificate holder shall ensure that each instructor performing supervisory functions—

(1) has satisfactorily completed the appropriate training required to serve as pilot-in-command in air operations; and is

(i) the holder of an appropriate and current flight instructor rating; or (ii) a person approved for that purpose; and

(2) has acquired at least 2000 hours of flight time as a pilot including—

(i) 200 hours' line-operating flight time experience for the particular aeroplane type involved: or

(ii) 100 hours supervising pilots on another aeroplane type to which this Subpart applies; and

(3) has completed a training course in the methods for assessing crew member competency in the technical and non-technical aspects of aircraft operation including human factors and crew resource management

121.589 Simulator instructor and examiner requirements

(a) The certificate holder shall ensure that, where instruction or competency checks are carried out in a flight simulator, the person performing the functions of an instructor, or flight examiner—

(1) meets the appropriate requirements of 121.583 or 121.585; and

(2) continues to demonstrate competency as pilot-in-command in the simulator to the standard and frequency required by Subpart J; and

(3) has received proficiency training in the operation of the training equipment; and

(4) has completed a training course in the methods for assessing crew member competency in the technical and non-technical aspects of aircraft operation including human factors and crew resource management.

(b) Where an instructor or flight examiner does not hold a current medical certificate,flight instructor rating, or flight examiner rating, the requirements under paragraph 121.583 (4) or 121.585(3) may be met in a flight simulator by—

(1) acting as a crew member—

(i) during simulated line operating flight time in a flight simulator for the type; or

(ii) for flight crew members under training who are undertaking the programmes required by 121.553(a) and (b); and

(2) completing the training requirements which would have been necessary to maintain the currency of, or be issued with, an appropriate flight instructor rating, or flight examiner rating, under Part 61 or Part 63, and Part 121.

121.591 Cabin crew instructor requirements

A holder of an air operator certificate must not designate a cabin crew member to perform the function of a cabin crew instructor in the flight crew member training programme required by this Part unless that cabin crew—

(1) has completed applicable training segments of the crew member training programme specified in rule 121.553; and

(2) has completed a training course in the methods for assessing cabin crew competency in the technical and non-technical aspects of aircraft operation including human factors and crew resource management; and

(3) is approved for that purpose.

121.593 Cabin crew examiner requirements

A holder of an air operator certificate must not designate a cabin crew member to perform the function of a cabin crew examiner for the purpose of rule 121.611 unless the cabin crew—

(1) has completed the training segments and course referred to in rule 121.591; and

(2) is qualified as specified in rule 121.577; and

(3) is approved for that purpose.

121.595 Ground instructor requirements

A holder of an air operator certificate must not designate a person to perform the functions of a ground instructor in its crew member training programme required by rule 121.553, unless that person has completed—

(1) an instructional techniques course acceptable to the Director; and

(2) human factors course acceptable to the Director; and

(3) a comprehensive training course in the subject matter area in which instruction is being provided; and

(4) is approved for that purpose.

Subpart J — Crew Member Competency Requirements

121.601 Purpose

This Subpart prescribes the rules governing the operational competency assessment of flight crew members, cabin crew, and other crew members, who are trained under the provisions of Subpart I.

121.603 Operational competency assessment programme

(a) The certificate holder shall establish an operational competency assessment programme in accordance with this Subpart that is controlled by the certificate holder.

(b) The certificate holder may—

(1) conduct the operational competency assessment programme; or

(2) contract with the holder of an aviation training organization certificate issued under Part 141, to conduct the operational competency assessment programme where the Part 141 certificate authorises the holder to conduct that training: or

(3) for an operational competency assessment programme conducted outside Papua New Guinea, contract with an organization that meets an equivalent standard specified by Part 141.

(c) The certificate holder shall ensure that the person responsible for its operational competency assessment programme holds a flight examiner rating or is a person approved for that purpose.

121.605 Operational competency assessment programme responsibilities

(a) The certificate holder shall be ultimately responsible for its operational competency assessment programme.

(b) The certificate holder shall ensure that each crew member that is subject to an operational competency assessment is assessed in accordance with that programme.

(c) The certificate holder shall ensure that each crew member released to conduct an air operation is properly trained and competent to perform the operation.

121.607 Flight crew competency checks

A holder of an air operator certificate must ensure—

(1) **each pilot acting as pilot-in-command has,** within the immediately preceding 12 months, successfully completed a check of route and aerodrome proficiency that is administered bya flight examiner and that—

(i) consists of at least one flight over one route segment and one or more landings at aerodromes representative of the operations to be flown; and

(ii) establishes that the pilot can satisfactorily perform the duties and responsibilities of a pilot- in-command in operations appropriate to this Part;and

(2) **each pilot conducting VFR operations has,** within the immediately preceding 12 months, successfully completed a competency check, that is administered by a flight examiner and that covers procedures, including emergency procedures, of the pilot's flying skill in an aeroplane type normally used by the pilot in the operation;and

(3) **each pilot acting as a flight crew member of an aeroplane operating under IFR has**, within the immediately preceding 6 months, passed a check that is administered by a flight examiner and that—

(i) covers procedures, including emergency procedures, appropriate to the equipment fitted to the aeroplane and to the type of operations to which the pilot is assigned by the certificate holder; and

(ii) is conducted in the same aeroplane type used by the pilot in the operation or a flight simulator of the same aeroplane type; and

(4) **each pilot has**, within the immediately preceding 12 months, successfully completed a written or oral test of the pilot's knowledge of the following—

(i) the relevant Civil Aviation Rules and the certificate holder’s operations specifications and exposition:

(ii) the aeroplane systems, performance, and operating procedures, and the content of the flight manual for each aeroplane type normally flown by the pilot:

(iii) navigation, ATS, and meteorology:

(iv) special flight operations as appropriate to the type of operation normally conducted by the pilot:

(v) new equipment, procedures, and techniques:

(vi) location and operation of the emergency equipment fitted to an aeroplane of the type normally flown by the pilot.

(5) **each flight engineer has**, within the immediately preceding 12 months, passed a check that is administered by a flight engineer examiner and that—

(i) covers procedures, including emergency procedures, appropriate to the equipment fitted to the aeroplane and to the type of operations to which the flight engineer is assigned by the certificate holder; and

(ii) is conducted in the same aeroplane type operated by all the flight engineer inthe operation, or in a flight simulator of the same aeroplane type; and

(6) **each flight engineer has**, within the immediately preceding 12 months, successfully completed a written or oral test of the flight engineer's knowledge of the following:

(i) the relevant Civil Aviation Rules and the certificate holder's operations specifications and exposition.

(ii) the aeroplane systems, performance, operating procedures, and the content of the flight manual for the aeroplane type normally operated by the flight engineer.

(iii) special flight operations that are appropriate to the type of operation normally conducted by the flight engineer.

(iv) new equipment, procedures, and techniques.

(7) in the case of checks and tests required under paragraphs (1), (2), (3), and (4), the flight examiner who administered the check or tests.

(i) certifies in the training record for the pilot that the check or test has been completed and certifies the result of the check or test; and

(ii) if the check or test was completed satisfactorily, certifies in the pilot log book in accordance with rule 61.29(a)(3) satisfactory completion of the check or test; and

(8) in the case of checks and tests under paragraphs (5) and (6), the flight engineer examiner who administered the check or test certifies in the training record for theflight engineer that the check or test has been completed and certifies the result of the check or test; and

(9) flight crew competency checks are carried out in an aeroplane or simulator approved for the purpose.

121.609 Flight-instructor competency checks

The certificate holder shall ensure that each person who conducts training or competency checks receives instruction and maintains proficiency as appropriate in—

(1) the methods of imparting instruction on how to operate, and how to ensure the safe operation of, a particular make and series aeroplane, or variant; and

(2) the methods of recovery from mishandled, non-normal, and emergency manoeuvres; and

(3) the operation of the aeroplane, equipment, or flight simulator used and, in operational flight, procedures and manoeuvres under normal, non-normal, and emergency conditions.

121.611 Cabin crew competency requirement

A holder of an air operator certificate must not use a cabin crew, and a person must not serve as a cabin crew member unless, within the immediately preceding 12 months, the certificate holder has determined by appropriate introduction and recurrent assessment and flight check as may be appropriate, that the person has adequate knowledge and is competent in the following areas as

appropriate to assigned duties and responsibilities—

(1) authority of the pilot-in-command; and

(2) procedures for passenger handling, including-

(i) procedures to be followed in dealing with special classes of passengers according to the certificate holder's exposition; and

(ii) procedures to be followed in handling passengers whose conduct might jeopardize safety; and

(iii) procedures for seating and evacuation of persons who might need assistance;and

(3) crew member assignments, functions, and responsibilities during emergencies, and

(4) briefing of passengers; and

(5) use of cabin equipment and controls; and

(6) location and operation of items of emergency equipment; and

(7) location and operation of oxygen equipment; and

(8) location and operation of every normal and emergency exits, including evacuation chutes and escape ropes; and

(9) first aid, including CPR; and

(10) for a senior cabin crew and his or her deputy, ability to supervise other cabin crew carrying out their duties.

121.613 Competency and testing records

The certificate holder shall maintain records of all competency assessments and testing of its crew members.

Subpart K — Fatigue of Flight Crew

121.801 Flight and duty time limitations

A holder of an air operator certificate must not assign a person for duty as a crew member, nor must a person undertake duties as a crew member, unless that person can do so in compliance with the fatigue risk management system or flight and duty time limitations prescribed under Part 122.

121.803 Safety critical positions

(a) A holder of an air operator certificate must identify safety critical positions in the air operator organization and establish a fatigue management scheme for those positions.

(b) For the purpose of applying paragraph (a), a safety critical position is one where a failure to perform a critical function by the person holding that position, either on afull time or shift basis, has a high likelihood of causing an accident or serious incident.

(c) The safety critical positions required by paragraph (a) must include the following:

(1) the person responsible for airworthiness and the control of maintenance.

(2) the person responsible for aircraft load control and dispatch.

Subpart L — Manuals, Logs, and Records

121.851 Purpose

This Subpart prescribes the rules governing the use and retention of the manuals, logs and records required for air operations performed.

121.853 Operating information

(a) The certificate holder shall ensure that the parts of the certificate holder's exposition relevant to the duties of a crew member are current and are accessible to the crew member for pre-flight planning, and in-flight operation.

(b) The certificate holder shall ensure that information provided for the compliance ofits operations personnel, in place of the AIP, has been reproduced accurately and iscurrent.

(c) A certificate holder that elects to use non-State charts and similar in-flight documentation shall ensure that this non-State material is identical in substance to the applicable State documentation.

(d) The certificate holder shall ensure that any amendments issued to them are properly actioned and documents remain current.

121.855 Documents to be carried

(a) A holder of an air operator certificate must ensure that the following documents are carried on each individual air operation—

(1) details of the operational flight plan; and

(2) NOTAM and aeronautical information service briefing documentation appropriate to the operation; and

(3) meteorological information appropriate to the operation; and

(4) the load manifest; and

(5) notification of dangerous goods; and

(6) copies of the relevant flight guide charts and plates; and

(7) for a regular air operation, a route guide covering each route flown and alternate aerodromes' that may be used.

(b) The holder of an air operator certificate must ensure that separate copies of the documents referred to in paragraph (a)(6) are available for each pilot performing flight crew duties on the flight.

121.857 Operation record

(a) The certificate holder shall for each air operation that it conducts, record—

(1) the planned aspects of the operation; and

(2) the actual accomplishment of the operation.

(b) The record shall be of a permanent nature.

121.859 Information retention period

(a) A holder of an air operator certificate must ensure that—

(1) the following information is retained for 12 months from the date it was completed operational records:

(i) load manifest:

(ii) notification of dangerous goods.

(iii) as applicable, flight data analysis records; and

(2) records of training, checking, and qualifications of every crew member are retained until 12 months after the individual has left the certificate holder's employment; and

(3) the following information is retained for two years after the date it was produced:

(i) occurrence reports.

(ii) hazard reports.

(iii) safety assessments.

(iv) records of emergency response exercise.

(v) audit reports.

Subpart M — Advanced Qualification Programme

121.901 Purpose

This Subpart prescribes rules governing the establishment and operation of an advanced qualification programme for qualifying, training, certifying, and otherwise ensuring competency of crew members and other personnel.

121.903 General

(a) Each holder of an air operator certificate shall establish an advanced qualification programme under this Subpart, or a training programme in accordance with Subpart I.

(b) The certificate holder shall, when establishing a programme under this Subpart, include a proposed plan for transition from its present training to the advanced qualification programme.

(c) The certificate holder shall ensure that the programme is conducted safely and without unacceptable risk to the equipment and personnel, or third parties.

(d) The certificate holder shall ensure that the person responsible for its programme holds a flight examiner rating.

(e) The certificate holder shall ensure that its programme is controlled by the certificate holder.

(f) The certificate holder shall ensure that each person to whom this Subpart applies complies with all requirements of the programme.

(g) The certificate holder shall ensure that the advanced qualification programme covers all positions for—

(1) flight crew members; and

(2) instructors; and

(3) flight examiners; and

(4) evaluators.

(h) The certificate holder shall ensure that, when categories not referred to in paragraph(g), such as cabin crew and other operations personnel, are included within an advanced qualification programme, all positions of that category are covered by theprogramme.

121.905 Programme revisions

(a) Each holder of an air operator certificate that establishes or revises an advanced qualification curriculum, shall comply with Subpart H, Subpart I, and Subpart J until the curriculum is acceptable to the Director.

(b) If the Director finds that a certificate holder is not conforming to its programme the Director may require the certificate holder to—

(1) revise its programme in a manner acceptable to the Director; or

(2) replace its advanced qualification programme with a training programme that complies with Subpart I and Subpart J.

(c) If the provisions of paragraph (b) are exercised, the Director may require the certificate holder to provide a plan, acceptable to the Director, to enable transition from its advanced qualification programme to its replacement programme.

121.907 Programme curriculum

(a) Each holder of an air operator certificate that establishes an advanced qualification programme shall ensure that the programme contains curricula—

(1) required by this Subpart; and

(2) that are acceptable to the Director.

(b) The certificate holder shall ensure that each curriculum in the programme—

(1) indicates the requirements in Part 61 or Part 121 Subpart I and Subpart J, as applicable, that would be replaced by the curriculum; and

(2) shows how the curriculum will provide an equivalent level of safety for each requirement of Part 61, or Part 121 Subpart I and Subpart J, that would be replaced by the curriculum; and

(3) includes each applicable requirement of Part 61, or Part 121 Subpart I and Subpart J, that is not specifically addressed in the curriculum; and

(4) specifies—

(i) the make, model, and aeroplane type, or variant; and

(ii) each crew member position, and other positions, to be covered by the curriculum.

121.909 Required curricula

(a) Each holder of an air operator certificate shall ensure that its advanced qualification programme has separate curricula for indoctrination, for qualification, and for continuing qualification.

(b) The indoctrination curriculum shall be designed to ensure that each person who is not qualified and currently serving in a position authorised by the certificate holder's certificate is indoctrinated in—

(1) the policies and operating practices of the certificate holder; and

(2) general operational knowledge; and

(3) any specific general information or general aeronautical knowledge necessaryfor the position the person will occupy.

(c) The qualification curriculum shall be designed to ensure that each person not qualified and currently serving in a position authorised by the certificate holder's certificate receives the technical training, evaluation, and certification necessary toperform assigned duties to the required standard.

(d) The continuing qualification curriculum shall be based on a qualification cycle designed to ensure that each person already qualified and currently serving in a position authorised by the certificate holder's certificate receives regular training for their position and continues to perform any assigned duties to the required standard.

121.911 Indoctrination curriculum

Each holder of an air operator certificate shall ensure that each indoctrination curriculum includes—

(1) for each person participating in this part of the programme, certificate holder policies, operating practices, and general operational knowledge; and

(2) for each flight crew member and operations personnel participating in this part of the programme, in addition to subparagraph (1), general aeronautical knowledge; and

(3) for each instructor participating in this part of the programme, in addition to subparagraph (1), the—

(i) fundamental principles of the teaching and learning process; and

(ii) methods and theories of instruction; and

(iii) knowledge necessary to use aeroplanes, flight training devices, flight simulators, and other training equipment in advanced qualification curricula;and

(4) for each flight examiner and evaluator participating in this part of the programme, in addition to subparagraph (1), the—

(i) evaluation requirements specified in each approved curriculum; and

(ii) methods of evaluating crew members and operations personnel; and

(iii) policies and practices used to conduct the kinds of evaluations particular to an advanced qualification programme curriculum

121.913 Qualification curriculum

A holder of an air operator certificate must ensure that each qualification curriculum includes—

(1) for a person participating in this part of the programme—

(i) the certificate holder's planned hours of training, evaluation, and supervised operating experience; and

(ii) a list of the training, qualification, and certification activities, as applicable to each person’s specific position; and

(iii) text describing the training, qualification, and certification activities, as applicable to each person’s specific position; and

(2) for a crew member, and other operations personnel, participating in this part of the programme, in addition to paragraph (a)(1), the certificate holder must list and describe in detail—

(i) training, evaluation, and certification activities that are aeroplane and equipment specific to qualify the person for a particular duty position on, orduties related to, the operation of a specific make, model, and series aeroplane or variant; and

(ii) the knowledge requirements, subject materials, job skills, and each manoeuvre and procedure to be trained and evaluated; and

(iii) the practical test requirements in addition to, or in place of, the requirements of Part 61, and a list of, and text describing, supervised operating experience; and

(3) for the instructor participating in this part of the programme, in addition to paragraph (a)(1), the certificate holder must list and describe in detail the training and evaluation used to qualify the person to impart instruction on how to operate,and on how to ensure the safe operation of, a particular make, model, and series aeroplane or variant; and

(4) for the flight examiner and evaluator participating in this part of the programme, in addition to paragraph (a)(1), the certificate holder must list and describe in detail the training, evaluation, and certification activities that are aeroplane and equipment specific to qualify the person to evaluate the performance of personnelwho operate, or who ensure the safe operation of, a particular make, model, and series aeroplane or variant.

121.915 Continuing qualification curriculum qualification cycles

(a) Each holder of an air operator certificate shall ensure that each continuing qualification curriculum is based on a qualification cycle that ensures—

(1) during each cycle, each person participating in this part of the programme will receive a balanced mix of training and evaluation on all events and subjects necessary for original qualification; and

(2) each person participating in this part of the programme maintains the minimum proficiency, level of knowledge, skills, and attitudes required for original qualification; and

(3) each flight crew member participating in this part of the programme complies with the recent experience requirements prescribed in 61.37.

(b) The certificate holder shall ensure that the duration of the continuing qualification cycle, does not initially exceed 26 calendar months, thereafter, if acceptable to the Director, the continuing qualification cycle may be extended if—

(1) the certificate holder demonstrates that an extension is warranted; and

(2) extensions do not exceed increments of three calendar months; and

(3) the continuing qualification cycle does not exceed a maximum of 39 calendar months.

(c) The certificate holder shall ensure that each continuing qualification curriculum includes requirements for requalifying a crew member, an aeroplane dispatcher, or any other operations personnel, who have not maintained continuing qualification.

Continuing qualification evaluation period

(d) The certificate holder shall ensure that each continuing qualification cycle includes an evaluation period, during which each person qualified under an advanced qualification programme will receive at least one training session and a proficiency evaluation at a training facility.

(e) The certificate holder shall ensure that the duration of the evaluation period required by paragraph (d) does not initially exceed 13 calendar months, thereafter, if acceptable to the Director, the continuing qualification cycle may beextended if—

(1) the certificate holder demonstrates that an extension is warranted; and

(2) extensions do not exceed increments of three calendar months; and

(3) the evaluation period does not exceed a maximum of 26 calendar months.

Evaluation period training session

(f) The certificate holder shall ensure that each evaluation period required byparagraph (d) includes training sessions, the number and frequency of which, must be acceptable to the Director.

(g) A training session, including any proficiency evaluation completed at that session, that occurs any time during the two calendar months before the last datefor completion of an evaluation period can be considered by the certificate holderto be completed in the last calendar month.

(h) The certificate holder shall ensure that during each training session each person participating in this part of the programme receives—

(1) for pilots-in-command, seconds-in-command, flight engineers, instructors, and evaluators, training in all events and major subjects required for original qualification that includes—

(i) ground training including a general review of knowledge and skills covered in qualification training; and

(ii) updated information on newly developed procedures, and safety information; and

(2) for crew members, aeroplane dispatchers, instructors, evaluators, and other operation personnel who conduct their duties in flight, training in all events and major subjects required for original qualification that includes proficiency training in an aeroplane, a flight training device, or a flight simulator on procedures, including emergency flight procedures and manoeuvres; and

(3) for instructors and evaluators, who are limited to conducting their duties inflight simulators, training in all events and major subjects required for

original qualification that includes—

(i) proficiency training in a flight simulator regarding operation of the training equipment; and

(ii) in operational flight, procedures and manoeuvres under normal, non-normal, and emergency conditions; and

(4) for instructors and evaluators who are limited to conducting their duties inflight training devices, training in all events and major subjects required for original qualification that includes—

(i) proficiency training in a flight training device regarding operation ofthe training equipment; and

(ii) in operational flight, procedures and manoeuvres under normal, non-normal, and emergency conditions.

Evaluation period proficiency evaluation sessions

(i) The certificate holder shall ensure that each evaluation period includes a proficiency evaluation conducted during each training session that each person participating inthis part of the programme shall successfully complete.

(j) The certificate holder shall ensure that each training session includes—

(1) for each person participating in this part of the programme, proficiency evaluation in all events and major subjects required for original qualification;and

(2) for each pilot-in-command and other eligible flight crew member participating in this part of the programme, line- operating flight time evaluations.

(k) The certificate holder shall ensure each proficiency evaluation is conducted—

(1) for each pilot-in-command, second-in-command, and flight engineer,participating in this part of the programme, in an aeroplane, flight simulator,or flight training device, or any combination of these, in accordance with thecertificate holder's curriculum; and

(2) for any other persons participating in this part of the programme, a means to evaluate their proficiency in the performance of their duties in their assigned tasks in an operational setting.

Evaluation period line-operating flight time evaluation sessions

(l) The certificate holder shall ensure that each pilot-in-command participating in this part of the programme successfully completes a line- operating flight time evaluation once during each evaluation period that—

(1) is conducted in an aeroplane performing air operations, or ferry flights or proving flights in an aeroplane used to perform air operations; and

(2) is completed in the calendar month that includes the midpoint of the

evaluation period; and

(3) is satisfactorily completed on the due date.

(m) The certificate holder shall ensure that during line operating flight time evaluations each person performing duties as a pilot-in-command, second-in-command, or flight engineer for that flight, is individually evaluated to determine whether the person—

(1) remains adequately trained and currently proficient with respect to the particular aeroplane, crew position, and type of operation in which the personserves; and

(2) has sufficient knowledge and skills to operate effectively as part of a crew.

(n) For the purpose of paragraph (l)(3), a line operating flight time evaluation completed within one calendar month of the day on which it is required shall be deemed to be completed on the due date.

(o) The certificate holder shall ensure each pilot-in-command and second-in-command,and, if the certificate holder elects, flight engineer, meets the recent experience requirements prescribed in 61.37 or 63.157 as appropriate.

121.917 Crew resource management requirements

(a) Each holder of an air operator certificate shall ensure each indoctrination,qualification, and continuing qualification curriculum includes—

(1) crew resource management training applicable to each position for which training is provided; and

(2) training in the use of each crew member's crew resource management skills,and evaluation of the skills and proficiency of each person being trained; and

(3) training and evaluation of each flight crew member's piloting, or other technical skills, in actual or simulated line-operating flight time.

(b) For flight crew members this training and evaluation shall be conducted in a flight training device or flight simulator.

121.919 Data collection requirements

Each holder of an air operator certificate shall ensure information is collected from its crew members, instructors, and evaluators, that will enable the Authority to determine whether the training and evaluations are working to accomplish the overall objectives of the programme.

121.921 Certification

A person enrolled in a programme is eligible to receive a commercial or airline transport pilot, flight engineer, or appropriate rating, based on the successful completion of training and evaluation events accomplished under the programme, if—

(1) training and evaluation of required knowledge and skills under the programme meets minimum certification and rating criteria established in Part 61 or Part 63; and

(2) the applicant satisfactorily completes the appropriate qualification curriculum; and the applicant shows competence in exercises that test both the required technical knowledge and skills, and crew resource management knowledge and skills, together; and the applicant is otherwise eligible under the applicable requirements of Part 61 or Part 63.

121.923 Approval of a person providing training by arrangement

(a) Each holder of an air operator certificate may contract with the holder of an aviation training organisation certificate issued under Part 141, where the Part 141 certificate authorises the holder to conduct advanced qualification programme training, qualification, or evaluation functions, to carry out those functions provided the programme meets the requirements of this Subpart.

(b) The holder of an air operator certificate that elects to contract a Part 141 certificated organisation in accordance with paragraph (a) shall ensure that—

(1) each instructor or evaluator, used by the Part 141 certificated organisation, meets all of the qualification and continuing qualification requirements that apply to employees of the holder of an air operator certificate that has arranged for the training, including knowledge of the certificate holder's operations; and

(2) each contracted Part 141 certificated organisation establishes and maintains records in sufficient detail of the training, qualification, and certification, of each person qualified under an advanced qualification programme in accordance with the training, qualification, and certification requirements of this Subpart.

Subpart N — Extended Diversion Time Operations (EDTO)Authorisation and Requirements

121.951 Purpose

(a) This Subpart prescribes rules governing the operations by turbine engine aeroplanes beyond 60 minutes' flying time to an en-route alternate aerodrome and extended diversion time operations.

(b) The EDTO provisions are divided into:

(i) the basic provisions that apply to all aeroplanes operating beyond 60 minutes to an en-route alternate aerodrome; and

(ii) provisions to fly beyond a threshold time, and up to a maximum diversion time, approved by the Director, that may be different for each operator and aeroplane type combination.

121.952 General

(a) A holder of an air operator certificate conducting operations beyond 60 minutes from a point on a route to an en-route alternate aerodrome must ensure that—

(1) for all aeroplanes—

(i) en-route alternate aerodromes are identified; and

(ii) the most up-to-date information is provided to the flight crew on identified en-route alternate aerodromes, including operational status and meteorological conditions; and

(iii) the operator has in place procedures to prevent the aeroplane being dispatched on a route with diversion times beyond the capability of EDTO significant systems time limitation, if any, indicated in the aeroplane flight manual (directly or by reference); and

(iv) with two turbine engines: the aeroplane is EDTO certified.

(2) for aeroplanes with two turbine engines, the most up-to-date information provided to the flight crew indicates that conditions at identified en-route alternate aerodromes will be at or above the operator's established aerodrome operating minima for the operation at the estimated time of use.

(b) In addition to paragraph (a), a holder of an air operator certificate must ensure that the following are taken into account and provide the overall level of safety required by this Subpart—

(1) Operational control and flight dispatch procedures; and

(2) Operating procedures; and

(3) Training programmes.

(c) A holder of an air operator certificate must not operate an aeroplane on an EDTO unless—

(1) the certificate holder is issued a specific approval in accordance with this Subpart to conduct an EDTO; and

(2) the specific approval shall identify the applicable threshold time established for each particular aeroplane and engine combination; and

(3) the certificate holder's operations specifications required by rule 119.13—

(i) permits the intended EDTO; and

(ii) authorizes the use of the airframe and engine combination for the EDTO; and

(4) procedures for meeting the requirements of this Subpart for EDTO aredetailed in the certificate holder's exposition required by rule 119.75.

(d) Notwithstanding (c), the Director may.

(1) based on the results of a specific safety risk assessment conducted by the air operator which demonstrates how an equivalent level of safety will be maintained, approve operations beyond the time limits of the most time-limited system; and

(2) the specific safety risk assessment shall include at least the

(i) capabilities of the operator; and

(ii) overall reliability of the aeroplane; and

(iii) reliability of each time-limited system; and

(iv) relevant information from the aeroplane manufacturer; and

(v) specific mitigation measures.

121.953 Requirements for EDTO up to 180 minutes' maximum diversion time— twin-engine aeroplanes

(a) A holder of an air operator certificate may apply in writing to the Director for an EDTO authorisation to operate an aeroplane with 2 turbine powered engines on an EDTO up to 180 minutes' maximum diversion time.

(b) A holder of an air operator certificate applying for an EDTO authorisation under paragraph (a) must provide the Director with the following information at least 90 days,

or a lesser period acceptable to the Director, before the proposed commencement of the EDTO:

(1) details of the particular airframe and engine combination of each aeroplane tobe operated under the EDTO authorisation:

(2) details, and evidence of the type design approval and the operating limitationof the airframe and engine combination, proposed under paragraph (1), for operating the aeroplane on an EDTO of more than 60 minutes' flight time from an adequate aerodrome:

(3) details of the CMP for the airframe and engine combination proposed under paragraph (1):

(4) the maximum diversion time proposed for the EDTO which must be not morethan 180 minutes:

(5) the minimum altitudes applicable to the routes to be flown on the EDTO including any diversionary routes:

(6) details of the fuel policy required to meet the requirements of rule 121.975:

(7) details of the maintenance programme required to meet the requirements of rule 121.409:

(8) details of the training programme required under Subpart I and applicable tothe EDTO and the maximum diversion time proposed under paragraph (4):

(9) details of the MEL relevant to the maximum diversion time proposed under paragraph (4):

(10) evidence that the aeroplane conforms to the fire detection and suppression limitations for cargo and baggage compartments prescribed in paragraph C.5(a)(2) of Appendix C to Part 26, or an equivalent standard acceptable to

the Director:

(11) evidence that time limited system capability for the aeroplane plus a 15- minute allowance for holding, approach, and landing is not less than the maximum diversion time proposed under paragraph (4):

(12) details of every EDTO alternate aerodrome that is required for the routes to be flown and the maximum diversion time proposed under paragraph (4):

(13) details—

(i) to confirm that every EDTO alternate aerodrome that is detailed under paragraph (12) has facilities to ensure the safety of a full complement of passengers and crew members; or

(ii) of the recovery plan for diversion to an EDTO alternate aerodrome that ensures the safety of a full complement of passengers and crew members at the aerodrome or in the immediate area until they are transported to another place that can provide for their safety.

121.955 EDTO authorisation up to 180 minutes' maximum diversion time —twin-engine aeroplanes

(a) The Director may amend the operations specifications required by rule 119.13 to authorise a holder of an air operator certificate to conduct air operations using an aeroplane with 2 turbine powered engines on EDTO up to 180 minutes' maximum diversion time if the Director is satisfied that—

(1) the airframe and engine combination are approved by the State of Design to operate to the maximum diversion time requested by the certificate holder; and

(2) every applicable requirement of this Part is met.

(b) Despite paragraph (a)(1), the Director may amend the operations specifications under paragraph (a) to authorise a holder of an air operator certificate to use an aeroplane on an EDTO to not more than 75 minutes' maximum diversion time if the aeroplane has 2 turbojet or turbofan powered engines; and

(c) The Director considers that the proposed airframe/engine combination, although not approved by the State of Design to operate more than 60 minutes' flight time (calculated at a one engine inoperative cruise speed in still air and ISA conditions) from an adequate aerodrome, is suitable for the intended EDTO.

121.957 Requirements for EDTO up to 240 minutes' maximum diversion time — twin- engine aeroplanes

(a) A holder of an air operator certificate who is authorised under rule 121.955 to operate an aeroplane with 2 turbine powered engines on an EDTO up to 180 minutes' maximum diversion time may apply in writing to the Director for an EDTO authorisation to operate an aeroplane with 2 turbine powered engines on an EDTO up to 240 minutes' maximum diversion time.

(b) A holder of an air operator certificate applying for an EDTO authorisation under paragraph (a) must provide the Director with—

(1) the information required by rule 121.953(b) but applicable to the maximum diversion time proposed for EDTO which may not be more than 240 minutes;and

(2) evidence that the aeroplane is equipped with a communications system that is—

(i) additional to the communications equipment required by rules 91.519 and 121.353; and

(ii) capable of providing direct communication of landline voice quality between the flight crew members and an appropriate ATS unit, and the flight crew members and the air operator.

121.959 EDTO authorisation up to 240 minutes' maximum diversion time —twin-engine aeroplanes

The Director may amend the operations specifications required by rule 119.13 to authorise a holder of an air operator certificate to conduct air operations using an aeroplane with 2 turbine powered engines on EDTO up to 240 minutes' maximum diversion time if the Director is satisfied that—

(1) the certificate holder has a demonstrated capability conducting EDTOs under a 180 minutes EDTO authorisation issued under rule 121.955; and

(2) the airframe and engine combination of the aeroplane to be used for the EDTO is approved by the State of Design to operate to the maximum diversion time requested by the certificate holder; and

(3) the requirements of rule 121.957(b) are met.

121.961 Requirements for EDTO more than 240 minutes' maximum diversiontime — twin- engine aeroplanes

(a) A holder of an air operator certificate may apply in writing to the Director for an EDTO authorisation to operate an aeroplane with 2 turbine powered engines on an EDTO more than 240 minutes' maximum diversion time if, immediately before applying, the certificate holder has been—

(1) conducting EDTO in accordance with an EDTO authorisation issued by the Director under rule 121.955 or 121.959 for at least 24 consecutive months; and

(2) conducting EDTO of more than 180 minutes with the aeroplane airframe/engine combination to be used in accordance with an EDTO authorisation issued by the Director under rule 121.959 for at least 12consecutive months.

(b) A holder of an air operator certificate applying for an EDTO authorisation under paragraph (a) must provide the Director with—

(1) the information required by rule 121.953(b) but applicable to the maximum diversion time proposed for EDTO; and

(2) evidence that the aeroplane is equipped with the communications system required by rule 121.957(b)(2).

121.963 EDTO authorisation more than 240 minutes' maximum diversion time— twin- engine aeroplanes

The Director may amend the operations specifications required by rule 119.13 to authorise a holder of an air operator certificate to conduct air operations using an aeroplane with 2 turbine powered engines on EDTO more than 240 minutes' maximum diversion time if the Director is satisfied that—

(1) the certificate holder has a demonstrated capability conducting EDTOs as required by rule 121.961(a); and

(2) the airframe and engine combination of the aeroplane to be used for the EDTO is approved by the State of Design to operate to the maximum diversion time requested by the certificate holder; and

(3) the requirements of rule 121.961(b) are met.

121.965 EDTO requirements — aeroplanes with more than 2 engines

(a) A holder of an air operator certificate may apply in writing to the Director for an EDTO authorisation to operate an aeroplane with more than 2 turbine powered engines on a route that requires the aeroplane to be more than 180 minutes' flight time (calculated at a one-engine inoperative cruise speed in still air and ISA conditions) from an adequate aerodrome.

(b) Subject to rule 121.967(b), a holder of an air operator certificate applying for an EDTO

authorisation under paragraph (a) must provide the Director with—

(1) the information required by rule 121.953(b) but applicable to the airframe and engine combination of the aeroplane to be used for the EDTO and to the maximum diversion time proposed; and

(2) evidence that the aeroplane is equipped with the communications system required by rule 121.957(b)(2).

121.967 EDTO authorisation — aeroplanes with more than 2 engines

(a) Subject to paragraph (b), the Director may amend the operations specifications required by rule 119.13 to authorise a holder of an air operator certificate to conduct air operations using an aeroplane with more than 2 turbine powered engines on EDTO more than 180 minutes' maximum diversion time if the Director is satisfied that:

(1) the requirements of rule 121.965(b) are met; and

(2) the airframe and engine combination of the aeroplane to be used for the EDTO is approved by the State of Design to operate to the maximum diversion time requested by the certificate holder.

(b) The requirements in rule 121.953(b)(3) regarding CMP details of the airframe and engine combination, and in paragraph (a)(2) regarding EDTO approval by the State of Design for the airframe and engine combination do not apply to an aeroplane with more than 2 turbine powered engines that was manufactured before 1 November 2018 and is used for EDTO more than 180 minutes maximum diversion time if the holder of the air operator certificate provides the Director with evidence that the airframe and engine combination of the aeroplane is suitable for the aeroplane to operate on EDTO to the maximum diversion time requested by the certificate holder.

121.969 EDTO dispatch requirements — general

(a) A holder of an air operator certificate who is authorised in accordance with this Subpart to conduct EDTO must not allow an aeroplane to be dispatched on an EDTO unless—

(1) the communications systems required by rules 91.519 and 121.353 are operable; and

(2) subject to paragraph (b), every aerodrome that is required for the operation, including take-off and take-off alternate, destination and destination alternate,and en-route EDTO alternate aerodromes, is listed in the dispatch release provided to the pilot- in-command; and

(3) for EDTO up to and including 180 minutes' maximum diversion time, the flight time (at a one engine inoperative cruise speed in still air and ISA conditions) to the nearest en-route EDTO alternate aerodrome listed in the dispatch release does not exceed the time specified in the aeroplane flight manual for the capability of the most critical time limited system (including the most limiting fire suppression time for the cargo and baggage compartments) minus 15 minutes.

(b) Except as provided in paragraph (c), an aerodrome may not be listed in the dispatch release under paragraph (a)(2) as an en-route EDTO alternate aerodrome unless—

(1) the aerodrome is an EDTO alternate aerodrome and is listed in the certificate

holder's operations specifications as required by rule 119.13(d)(3); and

(2) at least 1 suitable instrument approach procedure, published in the AIP of theState concerned, will be available at the aerodrome during the period from the earliest possible time of landing to the latest possible time of landing at the aerodrome; and

(3) the latest available meteorological forecast for the aerodrome indicates that, during the period from the earliest possible time of landing to the latest possible time of landing at the aerodrome—

(i) the meteorological conditions at the aerodrome will be at or above the relevant aerodrome planning minima for an en-route EDTO alternate aerodrome prescribed in rule 121.977; and

(ii) the crosswind component, including gusts, for the landing runway expected to be used is not more than the maximum permitted crosswind in the aeroplane flight manual.

(c) An aerodrome may be listed in a dispatch release as an en-route EDTO alternate aerodrome and the aeroplane dispatched on an EDTO if the meteorological forecast required by paragraph (b)(3) is not available at the time of dispatch but the pilot-in-command must not proceed beyond the point of sole reliance on the aerodrome unless the pilot-in-command receives a valid meteorological forecast for the aerodrome prior to reaching that point of sole reliance and the requirements of paragraph (b)(3) are met.

(d) For the purpose of paragraph (b)(3), forecast probabilities of less than 40% may be disregarded, but TEMPO conditions, when forecasted, must be taken into account when calculating fuel requirements.

121.971 EDTO dispatch — additional requirements for EDTO more than 180 minutes' maximum diversion time

A holder of an air operator certificate who is authorised in accordance with this Subpart to conduct an EDTO must not allow an aeroplane to be dispatched on an EDTO that requires the aeroplane to be more than 180 minutes' flight time from an en-route EDTO alternate aerodrome listed in the dispatch release unless:

(1) the requirements of rule 121.969 are complied with; and

(2) the following systems on the aeroplane are operational:

(i) fuel quantity indicating systems:

(ii) the APU, including the electrical and pneumatic supplies operating at the APU's designed capability, if an operational APU is required for the aeroplane to be approved for EDTO:

(iii) auto throttle/auto thrust systems:

(iv) the communications system required by rule 121.957(b)(2); and

(3) the aeroplane has a one-engine-inoperative auto-land capability if flight planning is predicated on that capability; and

(4) the flight time (at the all-engines operating cruise speed, correcting for wind and temperature) to the nearest en-route EDTO alternate aerodrome listed in the dispatch release does not exceed the time specified in the aeroplane flight manual for the most limiting capability of the cargo and baggage compartment fire suppression system minus 15 minutes at any stage of the flight; and

(5) the flight time (at a one engine inoperative cruise speed, correcting for wind and temperature) to the nearest en-route EDTO alternate aerodrome listed in the dispatch release does not exceed the time specified in the aeroplane flight manual for the capability of the most critical time limited system (not including cargo and baggage compartment fire suppression systems) minus 15 minutes.

121.973 EDTO en-route

(a) A holder of an air operator certificate who is authorised in accordance with this Subpart to conduct an EDTO must ensure that the pilot-in-command of an aeroplane conducting an EDTO under the authority of the certificate is notified of any significant change in the conditions at any en-route EDTO alternate aerodrome listed in the dispatch release for the flight—

(1) before the aeroplane proceeds beyond the EDTO entry point: and

(2) after the aeroplane has proceeded beyond the EDTO entry point.

(b) If the pilot-in-command of an aeroplane performing an EDTO is notified of a significant change in the conditions at an en-route EDTO alternate aerodrome listedin the dispatch release before the aeroplane proceeds beyond the EDTO entry point,the pilot-in-command must ensure that—

(1) the change in the conditions at the aerodrome are evaluated; and

(2) if any change in the conditions at the aerodrome may preclude a safe approach and landing at the aerodrome during the possible period of use referred to in paragraph (c)(1), an alternative and suitable en-route EDTO alternate aerodrome is selected where a safe approach and landing can be made.

(c) The pilot-in-command of an aeroplane performing an EDTO must not proceed beyond the EDTO entry point unless, for each en-route EDTO alternate aerodrome listed in the dispatch release for the flight or selected under paragraph (b)(2), —

(1) the meteorological forecast for the aerodrome indicates that the meteorological conditions will be at or above the published aerodrome landing minima for the expected approach during the period of possible use;and

(2) the aerodrome qualifies as an en-route EDTO alternate aerodrome.

(d) The pilot-in-command of an aeroplane performing an EDTO must ensure that the aeroplane complies with the in-flight operational requirements of the CMP standards for an EDTO.

(e) If the pilot-in-command of an aeroplane performing an EDTO is advised of a significant change in the conditions at an en-route EDTO alternate aerodrome listedin the dispatch release after the aeroplane has proceeded beyond the EDTO entry point, and the change in conditions makes the aerodrome no longer usable as an en-route EDTO alternate aerodrome, the pilot-in-command may only continue the flight if the pilot- in-command is satisfied that doing so would be safer than an alternative course of action.

(f) For the purpose of paragraphs (a), (b) and (e), a significant change in the conditions at an en- route EDTO alternate aerodrome includes:

(1) a change in the meteorological aerodrome forecast for the aerodrome that indicates that the weather conditions at the time of expected use will be belowthe landing minima for the aerodrome:

(2) a change in the condition of the aerodrome or services at the aerodrome that makes the aerodrome unsuitable as an EDTO alternate aerodrome.

121.975 EDTO fuel requirements

(a) A holder of an air operator certificate who is authorised in accordance with this Subpart to conduct an EDTO must not allow an aeroplane to be dispatched on an EDTO unless, in addition to the requirements of the certificate holder's fuel policy required by rule 121.71, the following requirements are met:

(1) the aeroplane must carry the greater of the following—

(i) sufficient fuel to fly to an en-route EDTO alternate aerodrome listed in the dispatch release assuming a rapid decompression at the most critical point followed by a descent to a safe altitude in compliance with rule 91.417, and rule 91.209 relating to the use of oxygen equipment, or

(ii) sufficient fuel to fly to an en-route EDTO alternate aerodrome listed in the dispatch release at the approved one engine inoperative cruise speed assuming a rapid decompression and a simultaneous engine failure at the most critical point followed by a descent to a safe altitude in compliance with rule 91.417 and the oxygen requirements of rule91.209; or

(iii) sufficient fuel to fly to an en-route EDTO alternate aerodrome listed in the dispatch release at the approved one engine inoperative cruise speed assuming an engine failure at the most critical point followed by a descent to the one engine inoperative cruise altitude:

(2) the aeroplane, upon reaching the en-route EDTO alternate aerodrome must have sufficient fuel to hold for 15 minutes at 1,500 feet above the aerodrome elevation and then to conduct an instrument approach procedure and land.

(b) For the purposes of calculating the fuel required by paragraph (a), the certificate holder must take the following matters into account:

(1) if the certificate holder is using a wind forecast model acceptable to the Director, a 5% wind speed factor (i.e. as an increment to a headwind or as a decrement to a tailwind) must be added onto the actual or forecast wind used to calculate the fuel required by paragraph (a)(1) to account for errors in wind forecasting:

(2) if the certificate holder is not using a wind forecast model acceptable to the Director, the aeroplane must carry an additional 5% of the fuel required by paragraph (a)(1) to allow for errors in wind forecasting:

(3) if icing conditions are forecast for the planned EDTO, the fuel required by paragraph (a)(1) must compensate for the greater of—

(i) the effect of airframe icing during 10% of the time during which icing is forecast taking into account the fuel that would be used by the use of engine and wing anti-ice during the same period; or

(ii) the fuel used by use of engine anti-ice systems, and if appropriate the use of wing anti- ice systems for the entire time during which icing is forecast:

(4) the fuel required by paragraph (a)(1) must include—

(i) additional fuel, calculated in accordance with the certificate holder's performance deterioration allowance monitoring programme to compensate for any increase in the aeroplanes fuel consumption; or

(ii) if a performance deterioration allowance monitoring programme is notused for the aeroplanes fuel consumption, an additional 5% of the fuel required by paragraph (a)(1) to account for the deterioration in cruise fuel burn performance:

(5) if an APU is a required power source for operating the aeroplane on an EDTO,the fuel required by paragraph (a)(1) must include the APU fuel consumption during every phase of flight when the APU may be used:

(6) the fuel required by paragraph (a)(1) must include any additional fuel consumption caused by the use of an MEL or configuration deviation list itemfor any applicable phases off light.

121.977 En-route EDTO alternate aerodrome planning minima

Except as provided in rule 121.979, the applicable minima for an aerodrome to be listed as an en-route EDTO alternate aerodrome under rule 121.969 are specified in the following table:

Facilities available at EDTO en-route alternate	Ceiling	Visibility
Two or More Separate Precision Approach Procedure Equipped Runways ***(Note: A single runway with reciprocal precision approach procedures does not meet this requirement)***	Cloud-base of 400 feet or a cloud-base of 200 feet above the lowest aerodrome landing minimum; whichever is higher.	A visibility of 1500 metres or a visibility of 800 metres more than the lowest aerodrome landing minimum. whichever is greater.
A Single Precision Approach Procedure	Cloud-base of 600 feet or a cloud-base of 400 feet above the lowest aerodrome landing minimum; whichever is higher.	A visibility of 3000 metres or a visibility of 1500 metres more than the lowest aerodrome landing minimum; whichever is greater.
Non-precision Approach Procedure	Cloud-base of 800 feet or a cloud-base of 400 feet above the lowest aerodrome landing minimum; whichever is higher	A visibility of 4000 metres or a visibility of 1500 metres more than the lowest aerodrome landing minimum; whichever is greater.

121.979 Lower en-route EDTO alternate aerodrome planning minima

Despite rule 121.977, at an aerodrome where a Category II or Category III precision approach procedure is permitted, planning minima lower than the en-route EDTO alternate aerodrome planning minima stated in rule 121.977 may be used if the precision approach is performed in accordance with the approved precision approach procedure manual required by rule 91.427.

121.981 Transition for existing ETOPS

For the purpose of this Part, a holder of an air operator certificate who, immediately before 1 November 2010, was authorised in the certificate holder's operations specifications to conduct extended-range twin- engine operations (ETOPS) using an aeroplane with 2 turbine powered engines is deemed to be authorised in accordance with Subpart N to conduct an EDTO using the same aeroplane airframe/engine combinations and on the same routes and to the same maximum diversion time as was authorised for ETOPS in the certificate holder'soperations specifications.

Subpart O — Transition Provisions

Transition provisions detailed in Part 20 apply to this Part.

Appendix A — Instruments and Equipment Airworthiness Design Standards

Instruments and equipment required by Subpart F shall meet the following specifications and requirements:

A.1 Protective breathing equipment

(a) Protective breathing equipment shall—

(1) meet the requirements of the TSO C99 series or the TSO C116 series;and

(2) provide a breathing gas system that is free from hazards in—

(i) itself; and

(ii) its method of operation; and

(iii) its effect upon other components; and

(3) provide protection for the eyes without unduly restricting vision; and

(4) allow any crew member to—

(i) determine during flight the quantity of breathing gas available in each source of supply unless the gas system uses chemical oxygen generators; and

(ii) use corrective glasses without undue impairment of vision, or loss of protection; and

(iii) communicate using the crew member intercom system; and

(5) allow the flight crew members to communicate using the aeroplaneradios; and

(6) breathing gas for 15 minutes at a pressure altitude of 8 000 feet.

(b) Protective breathing equipment may also be used to meet the supplemental oxygen requirements of Part 91 provided it meets the oxygen equipment standards.

A.2 Emergency medical kit

Emergency medical kits shall—

(1) be located and secured such that—

(i) the possibility of damage or loss as the result of an accident isminimised; and

(ii) there is no impact danger to the occupants of the aeroplane; and

(2) have its location marked on the outside of any compartment containing the kit; and

(3) be marked for use by qualified medical personnel only; and

(4) when containing narcotics, be installed in an aeroplane that—

(i) meets the requirements of the Dangerous Drugs Act Ch. 228 as amended; and

(ii) when not in use can be locked, or placed in a lockable hangar, or have the first aid kit containing narcotics removed to a safe and secure location.

A.3 Public address system

(a) A public address system shall—

(1) except for handsets, headsets, microphones, selector switches, and signalling devices, be capable of operation independent of the crew member intercom system; and

(2) be accessible for immediate use from each of two flight crew member stations in the flight crew compartment; and

(3) for each required floor-level passenger emergency exit that has an adjacent cabin crew seat, have a microphone which is readily accessible to the seated cabin crew; and

(4) be capable of operation within 10 seconds by a cabin crew at each of those stations in the passenger compartment from which its use is accessible; and

(5) be understandably audible at all times at all passenger seats, lavatories, cabin crew seats, and workstations.

(b) For the purposes of paragraph (a)(3) one microphone may serve more than one exit,provided the proximity of the exits allows unassisted verbal communication between seated cabin crew.

A.4 Crew member intercom system

A crew-member intercom system shall—

(1) except for handsets, headsets, microphones, selector switches, and signalling devices, be capable of operation independent of the public address system; and

(2) provide a means of two-way communication between all members of the flight crew; and

(3) provide a means of two-way communication between the flight crew compartment and each passenger compartment; and

(4) be accessible for immediate use from each of two flight crew member stations in the flight crew compartment; and

(5) be accessible for use from at least one normal cabin crew station in each passenger compartment; and

(6) be capable of operation within 10 seconds by a cabin crew member at each of those stations in each passenger compartment from which its use is accessible; and

(7) be accessible for use at enough cabin crew stations so that all floor-level emergency exits in each passenger compartment are observable from a station so equipped; and

(8) have an alerting system that—

(i) incorporates aural or visual signals for use by any crew member; and

(ii) has a means for the recipient of a call to determine whether it is a normal callor an emergency call; and

(9) provide a means of two-way communication between ground personnel and anytwo flight crew members in the flight crew compartment—

(i) when the aeroplane is on the ground; and

(ii) from a location that avoids visible detection from within the aeroplane during the operation of the ground personnel intercom system station.

A.5 Cockpit voice recorder

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.

A.5.1 Cockpit audio Recorder

Cockpit audio recording systems shall—

(1) not use magnetic tape or wire.

A.6 Flight data recorder

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 ina 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.

A.7 Additional attitude indicator

The third presentation of attitude shall be—

(1) operated independently of any other attitude indicating system; and

(2) powered from a source independent of the electrical generating system; and

(3) capable of continuous reliable operation for 30 minutes after total failure of the electrical generating system; and

(4) operative without selection after total failure of the electrical generating system;and

(5) appropriately lighted during all phases of operation.

A.8 Weather radar

Weather radar shall meet the requirements of the TSO C63 series.

A.9 Ground proximity warning system

GPWS shall meet the requirements of the TSO C92 series.

A.10 Terrain awareness warning system (TAWS)

TAWS Class A must meet the requirements of TSO C151a or TSO C151b for Class A equipment.

TAWS Class B must meet the requirements of TSO 151a or TSO C151b for Class B equipment.

A.11 Airborne collision avoidance system (ACAS II)

ACAS II Version 7.1 must meet the requirements of RTCA /DO-185B or EUROCAE/ED- 143.

A.12 Data link recorders

(a) Where the aircraft flight path is authorised or controlled through the use of data link messages, all data link messages, both uplinks (to the aircraft) and downlinks (from the aircraft), shall be recorded on the aircraft.

(b) As far as practicable, the time the messages displayed to the flight crew, and the time of the responses shall be recorded.

(c) Messages applying to the applications listed below shall be recorded. Applicationswithout the asterisk (*) are mandatory applications which shall be recorded regardless of the system complexity. Applications with an (*) shall be recorded onlyas far as is practicable given the architecture of the system.

(1) Data link initiation capability

(2) Controller-pilot data link communications

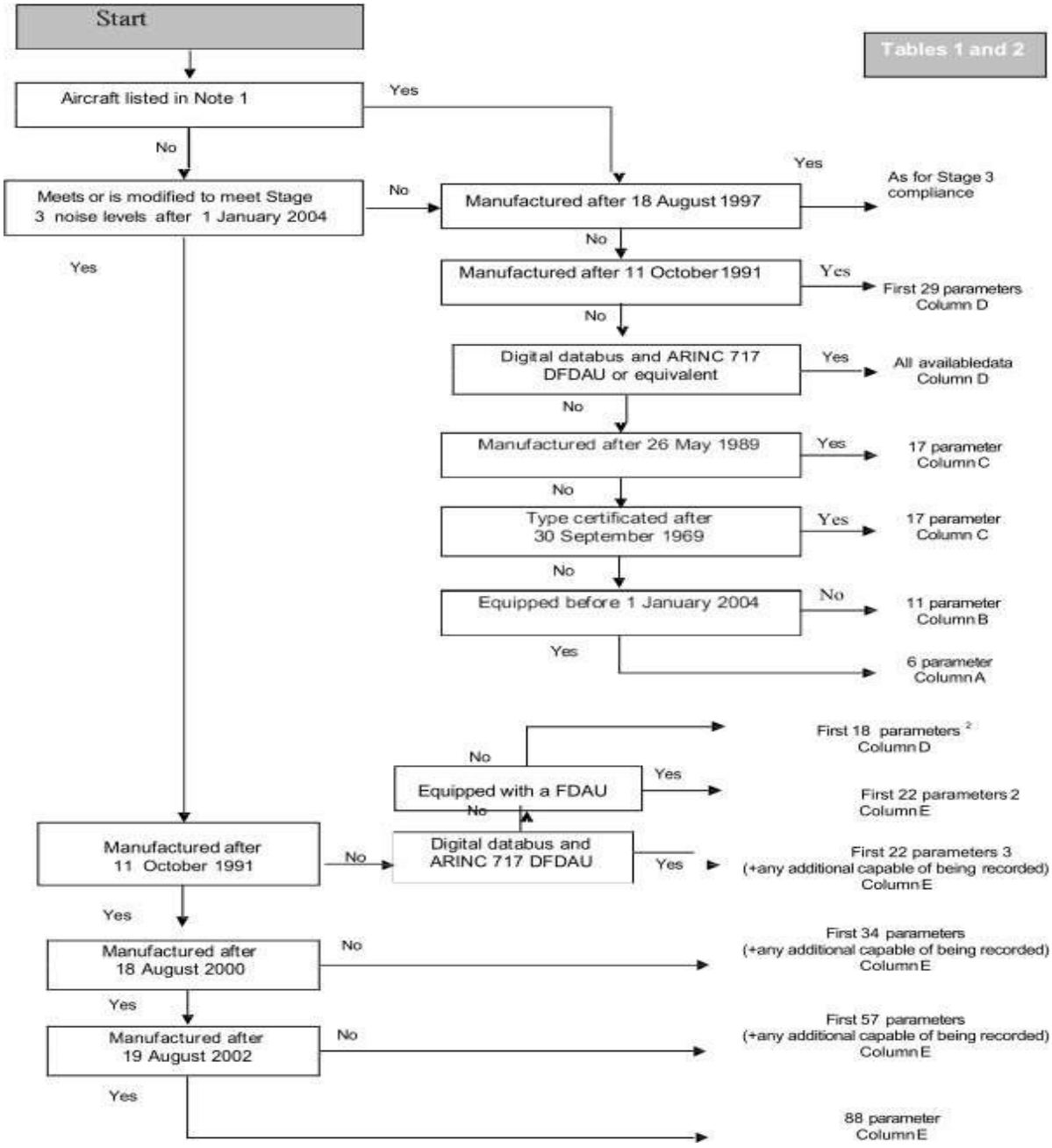
(3) Data link flight information services

(4) Automatic dependent surveillance — contract

(5) Automatic dependent surveillance — broadcast*

(6) Aeronautical operational control*.

Appendix A Figure 1 – FDR Requirement 121.371 Decision Chart



Flight Data Recorder Decision Chart Notes:

1. *General Dynamics Convair 580, 600, 640, DE Havilland Aircraft Company Ltd. DHC- 7, Fairchild Industries FH 227, Fokker F-27 (except Mark 50), F-28 Mark 1000 and Mark 4000, Gulfstream Aerospace G-159, Lockheed Aircraft Corporation Electra 10-A, 10-B, 10-E, L-188, Maryland Air Industries, Inc. F27, Mitsubishi Heavy Industries, Ltd. YS-11, Short Bros. Limited SD3-30, SD3-60.*
2. *Parameters 12 through 17 may be recorded from a single source.*
3. *Parameters 12 through 14 may be recorded from a single source*

Table 1. Part 121 - Flight Data Recorder Parameter Requirements

When reading the parameter specifications from Table 2 the corresponding shaded specification should be chosen for each parameter. This table refers to the FDR requirements of 121.371.

	(A)	(B)	(C)	(D)	(E)
Parameters * If installed	**6 Parameter**	**11 Parameter**	**17 Parameter**	**44 Parameter**	**88 Parameter**
1	Time	Time	Time	Time	Time or Relative time counts
2	Altitude	Altitude	Altitude	Altitude	Pressure Altitude
3	Airspeed	Airspeed	Airspeed	Airspeed	Indicated airspeed orCalibrated airspeed
4	Vertical acceleration	Vertical acceleration	Vertical acceleration	Heading	Heading (primary flightcrew reference)
5	Heading	Heading	Heading	Vertical acceleration	Normal acceleration (vertical)
6	Time of radio transmission to/from ATC	Time of radio transmission to/from ATC	Time of radio transmission to/from ATC	Pitch attitude	Pitch attitude
7		Pitch attitude	Pitch attitude	Roll attitude	Roll attitude
8		Roll attitude	Roll attitude	Radio transmitter keying	Manual radio transmitter keying or CVR/DFDR synchronisation reference
9		Longitudinal acceleration	Longitudinal acceleration	Thrust/power on each engine	Thrust/power on each engine(primary flight crew reference)
10		Control column OR pitch control surface position	Pitch trim position	Trailing edge flap OR cockpit control selection	Autopilot engagement
11		Thrust of each engine	Control column OR pitch control surface position	Leading edge flap OR cockpit control selection	Longitudinal acceleration
12			Control wheel OR lateral control surface position	Thrust reverser position	Pitch control(s) position (non-fly-by-wiresystems)
					Pitch control(s) position(fly-by-wire systems)
13			Rudder pedal OR yaw control surface position	Ground spoiler position/speed brake selection	Lateral control(s) position(non-fly-by-wire systems)
					Lateral control(s) position (fly-by-wiresystems)
14			Thrust of each engine	Marker beacon passage	Yaw control(s) position (non-fly-by-wiresystems)
					Yaw control(s) position (fly-by-wire systems)

Table 1. Part 121 – Flight Data Recorder Parameter Requirements

When reading the parameter specifications from Table 2 the corresponding shaded specification should be chosen for each parameter. This table refers to the FDR requirementsof 121.371.

	(A)	(B)	(C)	(D)	(E)
Parameters * if installed	**6 Parameter**	**11 Parameter**	**17 Parameter**	**44 Parameter**	**88 Parameter**
15			Position of each thrust reverser	Autopilot engagement	Pitch control surface(s) position
16			Trailing edge flap OR cockpit flap control position	Longitudinal acceleration	Lateral control surface(s) position
17			Leading edge flap OR cockpit flap control position	Pilot input and/or surface position – primary controls	Yaw control surface(s)position
18				Lateral acceleration	Lateral acceleration
19				Pitch trim position	Pitch trim surfaceposition
20				Glideslopee deviation	Trailing edge flap or cockpit control position
21				Localiser deviation	Leading edge flap or cockpit control position
22				AFCS mode and engagement status	Each thrust reverser position or equivalent forpropeller aeroplane
23				Radio altitude	Ground spoiler positionor speed brake position
24				Master warning	Outside air temperature or totalair temperature
25				Main gear squat switch status	Autopilot/ auto throttle/AFCS modeand engagement status
26 *				Angle of attack	Radio altitude
27				Outside air temperature OR total air temperature	Localiser deviation orMLS azimuth
28				Hydraulics, each system, low pressure	Glideslope deviation orMLS elevation
29				Groundspeed	Marker beacon passage

Table 1. Part 121 – Flight Data Recorder Parameter Requirements

When reading the parameter specifications from Table 2 the corresponding shaded specification should be chosen for each parameter. This table refers to the FDR requirements of 121.371.

	(A)	(B)	(C)	(D)	(E)
Parameters * if installed	**6 Parameter**	**11 Parameter**	**17 Parameter**	**44 Parameter**	**88 Parameter**
30				Drift angle	Master warning
31				Wind speed and direction	Air/ground sensor (primary aeroplane sensor, nose or main gear)
32 *				Latitude and longitude	Angle of attack (if measure directly)
33				Brake pressure/pedal position	Hydraulic pressure low, each system
34 *				Additional engine parameters: EPR, N_1, N_2	Groundspeed
35				Exhaust Gas Temperature	GPWS
36				Throttle lever position	Landing gear position or landing gear cockpit control selection
37 *				Fuel flow	Drift angle
38 *				TCAS - TA	Wind speed and direction
39 *				TCAS - RA	Latitude and longitude
40 *				TCAS - Sensitivity level	Stick shaker and pusher activation
41 *				Ground Proximity Warning System	Windshear
42				Landing gear or gear selector position	Throttle/power lever position
43				DME 1 and 2 distances	Additional engine parameters
44				Nav 1 and 2 frequency selection	TCAS
45					DME 1 and 2 distances
46					Nav 1 and 2 selected frequency

Table 1. Part 121 – Flight Data Recorder Parameter Requirements

When reading the parameter specifications from Table 2 the corresponding shaded specification should be chosen for each parameter. This table refers to the FDR requirements of 121.371.

	(A)	(B)	(C)	(D)	(E)
Parameters * if installed	**6 Parameter**	**11 Parameter**	**17 Parameter**	**44 Parameterr**	**88 Parameter**
47 *					Selected barometric setting
48 *					Selected altitude
49 *					Selected speed
50 *					Selected Mach
51 *					Selected vertical speed
52 *					Selected heading
53 *					Selected flight path
54 *					Selected decision height
55					EFIS display format
56					Multi-function/engine alerts display
57 *					Thrust command
58 *					Thrust target
59 *					Fuel quantity in CG trimtank
60					Primary navigation systemreference
61 *					Ice detection
62 *					Engine warning eachengine - vibration
63 *					Engine warning eachengine - over temp
64 *					Engine warning each engine -oil pressure low
65 *					Engine warning eachengine - over speed
66					Yaw trim surface position

Table 1. Part 121 - Flight Data Recorder Parameter Requirements

When reading the parameter specifications from Table 2 the corresponding shaded specification should be chosen for each parameter. This table refers to the FDR requirements of 121.371.

	(A)	(B)	(C)	(D)	(E)
	6 Parameter	11 Parameter	17 Parameter	44 Parameter	88 Parameter
67					Roll trim surface position
68					Brake pressure - left and right
69					Brake pedal application - left and right
70 *					Yaw and side-slip angle
71 *					Engine bleed valve position
72 *					De-icing or anti- icing system selection
73 *					Computed centre of gravity
74					AC electrical bus status
75					DC electrical bus status
76 *					APU bleed valve position
77					Hydraulic pressure each system
78					Loss of cabin pressure
79					Computer failure - critical flight and engine control systems
80 *					HUD
81 *					Para-visual display
82					Cockpit trim control input position - pitch
83					Cockpit trim control input position - roll
84					Cockpit trim control input position - yaw
85					Trailing edge flap and cockpit flap control position
86					Leading edge flap and cockpit flap control position
87					Ground spoiler position and speed brake selection
88					All cockpit flight control input forces - control wheel, control column, rudder pedal

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of 121.371.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
Time or	24 hours	±0.125% per hour	4	1s	UTC time preferred when
Relative time counts	0 to 4095				available. Counter increments each four seconds of system operation
Pressure Altitude	-1000' to maximum certificated	±100' to ±700' (refer TSO C124a, C51a)	1	5' to 35'	Data should be obtained from the air data computer when
	altitude -1000' to maximum certificated altitude +5000'				practicable
Indicated airspeed or Calibrated airspeed	50 KIAS or minimum value to Max V_{SO}, and V_{SO} to 1.2V_D	±5% and ±3%	1	1kt	Data should be obtained from the air data computer when practicable
Heading	0 - 360º	±2º	1	0.5º	When true or magnetic
(primary flight crew reference)	0 - 360º and discrete 'true' or 'mag'				heading can be selected as the primary heading reference, a discrete indicating selection must be recorded
Normal acceleration (vertical)	-3g to +6g	±1% maximum range excluding datum error of ±5%	0.125	0.004g	
Pitch attitude	±75º	±2º	1 or 0.5 for aeroplanes Manufactured after 2002	0.5º	A sampling rate of 0.25 is recommended
Roll attitude	±180º	±2º	1 or 0.5 for aeroplanes Manufactured after 2002	0.5º	A sampling rate of 0.5 is recommended
Manual radio transmitter keying or CVR/DFDR synchronisation reference	Discrete - 'on' or 'off'		1		Preferably each crew member but one discrete acceptable for all transmission provided the CVR/DFDR system complies with TSO C124a CVR synchronisation requirements
Thrust/power on each engine (primary flight crew reference)	Full range forward	±2%	1 per engine	0.3% of full range	Sufficient parameters (e.g. EPR, N_1 or Torque, N_P) as appropriate to the particular engine be recorded to determine power in forward and reverse thrust, including potential over speed conditions
Auto pilot engagement	Discrete - 'on' or 'off'		1		
Longitudinal acceleration	±1g	±1.5% maximum range excluding datum error of ±5%	0.25	0.004g	

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of 121.371.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
Pitch control(s) position (non fly-by- wire systems)1	Full range	±2°	0.5 or 0.25 for aeroplanes manufactured after 2002	0.5% of full range	For aeroplanes that have a flight control break away capability that allows either pilot to operate the controls independently, record both control inputs. The control inputs may be sampled alternately once per second to produce the sampling interval of 0.5 or 0.25, as applicable
Pitch control(s) position (fly-by-wire systems)	Full range	±2°	0.5 or 0.25 for aeroplanes manufactured after 2002	0.275% of full range	
Lateral control(s) position (non fly-by-wire systems)1	Full range	±2°	0.5 or 0.25 for aeroplanes manufactured after 2002	0.2% of full range	For aeroplanes that have a flight control break away capability that allows either pilot to operate the controls independently, record both control inputs. The control inputs may be sampled alternately once per second to produce the sampling interval of 0.5 or 0.25, as applicable
Lateral control(s) position (fly-by-wire systems)	Full range	±2°	0.5 or 0.25 for aeroplanes manufactured after 2002	0.22% of full range	
Yaw control(s) position (non fly-by-wire systems)1	Full range	±2°	0.5	0.3% of full range	For aeroplanes that have a flight control break away capability that allows either pilot to operate the controls independently, record both control inputs. The control inputs may be sampled alternately once per second to produce the sampling interval of 0.5
Yaw control(s) position (fly-by-wire systems)	Full range	±2°	5	0.2% of full range	
Pitch control surface(s) position1	Full range	±2°	0.5 or 0.25 for aeroplanes manufactured after 2002	1.2% of full range	For aeroplanes fitted with multiple or split surfaces, a suitable combination of inputs is acceptable in lieu of recording each surface separately. The control surfaces may be sampled alternately to produce the sampling interval of 0.5 or 0.25
Lateral control surface(s) position1	Full range	±2°	1 0.5 or 0.25 for aeroplanes manufactured after 2002	1.3% of full range	For aeroplanes fitted with multiple or split surfaces, a suitable combination of surface position sensors is acceptable in lieu of recording each surface separately. The control surfaces may be sampled alternately to produce the sampling interval of 0.5 or0.25

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of 121.371.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
Yaw control surface(s) position1	Full range	±2º	1 0.5	0.2% of full range	For aeroplanes fitted with multiple or split surfaces, a suitable combination of surface position sensors is acceptable in lieu of recording each surface separately. The control surfaces may be sampled alternately to produce the sampling interval of 0.5
Lateral acceleration	±1g	±1.5% maximum range excluding datum error of ±5%	0.25	0.004g	Twin engine aircraft only
Pitch trim surface position	Full range	±3%	1	0.6% of full range	
Trailing edge flap or cockpit control position	Full range or discrete each position	±3º or pilot's indicator	2	0.5% of full range	Flap position and cockpit control may each be sampledalternately at four second intervals, to give a data pointevery two seconds
Leading edge flap or cockpit control position	Full range or discrete each position	±3º or pilot's indicator	2	0.5% of full range	Left and right sides, or flap position and cockpit control may each be sampled at four second intervals, so as to give a data point each two seconds
Each thrust reverser position or equivalent for propeller aeroplane	Discrete - 'stowed', 'in transit', 'reverse'		1 per engine		Turbo-jet - two discretes enable the three states to be determined Turbo-prop – one discrete
Ground spoiler position or speed brake position	Full range or discrete each position	±2º	1 or 0.5 for aeroplanes manufactured after 2002	0.5% of full range	
Outside air temperature or total air temperature	-50ºC to +90ºC	±2º C	2	0.3º C	
Autopilot/auto throttle/ AFCS mode and engagement status	Discretes - suitable combination		1		Discretes should show which systems are engaged and which primary modes are controlling the flight path and speed of the aircraft
Radio altitude	-20' to +2500'	±2' or ±3% whichever is the greater below 500' and ±5% above 500'	1	1' ±5% above500'	For Autoland/category III operations, each radio altimeter should be recorded but arranged so that at least one is recorded each second.
Localiser deviation or MLS azimuth	±400 micro amps oravailable sensor range as installed ±62º	As installed - ±3% recommended	1	0.3+ of full range	For Autoland/category III operations, each radio altimeter should be recorded but arranged so that at least one is recorded each second. It is not necessary to record ILS and MLS at the same time, only the approach aid in use need be recorded
Glideslope deviation or	±400 micro amps or available sensor range as installed	As installed - ±3% recommended	1	0.3% of full range	For Autoland/category III operations, each radio altimeter should be recorded but arranged so that at least one is recorded each second. It is not necessary to record ILS and MLS at the same time, only the approach aid in use need be recorded

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of 121.371.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
MLS elevation	+0.9º to +30º				
Marker beacon passage	Discrete - 'on' or 'off'		1		A single discrete is acceptable for all markers
Master warning	Discrete		1		Record the master warning and record each 'red' warning that cannot be determined from other parameters or from the cockpit voice recorder
Air/ground sensor (Primary aeroplane sensor, nose or main gear)	Discrete - 'air' or 'ground'		1 (0.25recommended)		
Angle of attack (if measure directly)	As installed	As installed	2 or 0.5 for aeroplanes manufactured after 2002	0.3% of full range	If left and right sensors are available, each may be recorded at four second intervals so as to give a data point each 0.5 second
Hydraulic pressure low, each system	Discrete - 'low' or 'normal' or available sensor range	±5%	2	0.5% of full range	
Groundspeed	As installed	Most accurate system installed	1	0.2% of full range	
GPWS	Discrete - 'warning' or 'off'		1		A suitable combination of discrete unless recorder capacity is limited in which case a single discrete for all modes is acceptable
Landing gear position or landing gear cockpit control selection	Discrete		4		A suitable combination of discrete should be recorded
Drift angle	As installed	As installed	4	0.1º	
Wind speed and direction	As installed	As installed	4	1kt and 1º	
Latitude and longitude	As installed	As installed	4	0.002º	Provided by the Primary Navigation System Reference. Where capacity permits latitude/longitude resolution should be 0.0002º
Stick shaker and pusher activation	Discrete - 'on' or 'off'		1		A suitable combination of discrete to determine activation
Windshear detection	Discrete - 'warning' or 'off'		1		
Throttle/power lever position	As installed Full range	As installed ±2%	1 per lever	 2% of full range	For aeroplanes with non-mechanically linked cockpit engine controls
Additional engine parameters	As installed	As installed	Each engine each second	2% of full range	EPR, N_1, N_2, EGT Where capacity permits, the preferred priority is - indicated vibration level, N_2, EGT, Fuel Flow, Fuel Cut-off lever position, and N_3, unless the engine manufacturer recommends otherwise

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of 121.371.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
TCAS	Discretes	As installed	1		A suitable combination of discrete should be recorded to determine the status of - Combined Control, Vertical Control, Up Advisory, and Down Advisory. (Refer ARINC Characteristic 735 -Attachment 6E, TCAS VERTICAL RA DATA OUTPUT WORD)
DME 1 and 2 distances	0 - 200nm	As installed	4	1nm	1 mile
Nav 1 and 2 selected frequencies	Full range	As installed	4		Sufficient to determine selected frequency
Selected barometric setting	Full range	±5%	1 per 64 seconds	0.2% of full range	
Selected altitude	Full range	±5%	1	100’	
Selected speed	Full range	±5%	1	1kt	
Selected Mach	Full range	±5%	1	0.01	
Selected vertical speed	Full range	±5%	1	100ft/min	
Selected heading	Full range	±5%	1	1°	
Selected flightpath	Full range	±5%	1	1°	
Selected decision height	Full range	±5%	64	1’	
EFIS display format	Discretes		4		Discretes should show the display system status (off, normal, fail, composite, sector, plan, navigation aids, weather radar, range, copy)
Multi-function/engine alerts display format	Discretes		4		Discretes should show the display system status (off, normal, fail) and the identity of display pages for emergency procedures need not be recorded
Thrust command	Full range	±2%	2	2% of full range	
Thrust target	Full range	±2%	4	2% of full range	
Fuel quantity in CG trim tank	Full range	±5%	1 per 64 seconds	1% of full range	
Primary navigation system reference	Discretes - ‘GPS’, ‘INS’, ‘VOR/DME’, ‘MLS’, ‘Loran C’, ‘Omega’, ‘Localiser Glideslope’		4		A suitable combination of discrete to determine the Primary Navigation System reference
Ice detection	Discrete - ‘ice’ or ‘no ice’		4		
Engine warning each engine vibration	Discrete		1		

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of 121.371.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
Engine warning each engine - overtime	Discrete		1		
Engine warning each engine - oil pressure low	Discrete		1		
Engine warning each engine - over speed	Discrete		1		
Yaw trim surface position	Full range	±3%	2	0.3% of full range	
Roll trim surface position	Full range	±3%	2	0.3% of full range	
Brake pressure - left and right	As installed	As installed ±5%	1		To determine braking effort applied by pilots or by autobrakes
Brake pedal application - left and right	Discrete or analogue - 'applied' or 'off'	As installed ±5%	1		To determine braking applied by pilots
Yaw and side-slip angle	Full range	±5%	1	0.5°	
Engine bleed valve position	Discrete - 'open' or 'closed'		4		
De-icing or anti-icing system selection	Discrete - 'on' or 'off'		4		
Computed centre of gravity	Full range	±5%	1 per 64 seconds	1% of full range	
AC electrical bus status	Discrete - 'power' or 'off'		4		Each bus
DC electrical bus status	Discrete - 'power' or 'off'		4		Each bus
APU bleed valve position	Discrete - 'open' or 'closed'		4		
Hydraulic pressure each system	Full range	±5%	2	100psi	
Loss of cabin pressure	Discrete - 'loss' or 'normal'		1		
Computer failure- critical flight and engine control systems	Discrete - 'fail' or 'normal'		4		
HUD	Discrete - 'on' or 'off'		4		

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of 121.371.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
Para-visual display	Discrete - 'on' or 'off'		1		
Cockpit trim control input	Full range	±5%	1	0.2% of full range	
Cockpit trim control input	Full range	±5%	1	0.2% of full range	
Cockpit trim control input	Full range	±5%	1	0.2% of full range	
Trailing edge flapand cockpit flap control position	Full rangeor discrete	±5%	2	0.2% of full range	Trailing edge flaps and cockpit flap control positionmay each be sampled alternately at four second
Leading edgeflap and cockpit flap control	Full range or discrete	±5%	1	0.5% of full range	
Ground spoiler position andspeed brake	Full range or discrete	±5%	0.5	0.3% of full range	
All cockpit flight control input forces - control wheel, control	Full range - wheel, column, pedals	±5% - ±70lbs, ±85lbs, ±165lb	1	0.3% of full range	For fly-by-wire flight control systems, where flight control surface position is a functionof the displacement of the control input

Notes:

1. For aeroplanes that can demonstrate the capability of deriving either the control input or control movement (one from the other) for all modes of operation and flight regimesonly the surface position OR the control position need be sensed.

2. For aeroplanes with non-mechanical control systems (fly-by-wire) both surface and control position must be recorded.

Appendix B — Runways

B.1 Minimum runway widths

To determine the minimum runway width, it is necessary to ascertain the aerodrome reference code (ARC) appropriate to the aeroplane type by using Table 1. The code is composed of two elements which are related to the aeroplane performance, characteristics, and dimensions. Element 1 is a number based on the aeroplane reference field length (ARFL) and element 2 is a letter based on the aeroplane wingspan and outer main gear wheel span.

B.1.1 Determining the ARC using Table 1

(a) **Firstly:** Determine the ARFL of the aeroplane to be operated. The ARFL is the minimum field length for take-off at maximum certificated take-off weight, at sea level, in standard atmospheric conditions, in still air, and with zero runway slope, as derived from the aircraft flight manual;

(b) **Secondly:** Determine the code number for element 1 **applying** the aeroplanes aerodrome reference field length; and

(c) **Thirdly:** Determine the code letter of element 2 corresponding to the dimensions of the aeroplanes wing and outer main gear span. The code letter for element 2 is the codeletter which corresponds to the wingspan, or the outer main gear span, whichever givesthe most demanding code letter. For instance, if code letter C corresponds to the aeroplanes wingspan and code letter D corresponds to the aeroplanes outer main gearspan, the code letter selected would be D for that aeroplane type.

Table 1. Aerodrome Reference Code (ARC)

Code Element 1		Code Element 2		
Code Number	Aeroplane Reference Field Length	Code Letter	Wingspan	Outer Main Gear Wheel Span
1	Less than 800 m	A	Up to but not including 15 m	Up to but not including 4.5 m
2	800 m up to but not including 1200 m	B	15 m up to but not including 24 m	4.5 m up to but not including 6 m
3	1200 m up to but not including 1800 m	C	24 m up to but not including 36 m	6 m up to but not including 9 m
4	1800 m and over	D	36 m up to but not including 52 m	9 m up to but not including 14 m
		E	52 m up to but not including 65 m	9 m up to but not including 14 m

B.1.2 Determining the minimum runway width using Table 2

Having determined the aeroplanes ARC, the minimum runway widths are determined by entering at the applicable code number and then moving across to the value under the applicable code letter. For instance, if the aeroplane ARC is 2C, the required minimum runway width is 30 m.

Table 2. Runway widths

	Code Letter				
Code Number	A	B	C	D	E
1	18 m	18 m	23 m	-	-
2	23 m	23 m	30[1] m	-	-
3[1]	30 m	30 m	30 m	45 m	-
4[1]*	-	-	45 m	45 m	45 m

Note 1. Aeroplanes not in excess of 18,500 kg MCTOW may be operated on a runway with a width not less than 23 m regardless of that aeroplanes ARC.