

Civil Aviation Rules



Part 121

**Air Operations — Large
Aeroplanes**

5 April 2025

CAA Consolidation

Rule Objective

The objective of Part 121 is to maintain a safe aviation system through ensuring applicable ICAO safety standards related to air operations in large aeroplanes are met and maintained. This Part applies to air operations conducted by a holder of an airline Air Operator Certificate issued in accordance with Part 119 using an aeroplane that has—

- a seating configuration of more than 30 seats, excluding any required crew member seat; or
- a payload capacity of more than 3410 kg.

Part 121 prescribes rules applying 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.

This document is the current consolidated version of Part 121 produced by the Civil Aviation Authority, and serves as a reference only. It is compiled from the rules that have been signed into law by the Minister of Transport. Copies of the rules as signed by the Minister of Transport may be obtained from the Civil Aviation Authority or may be downloaded from the official web site at: www.caa.govt.nz

Bulletin

This Part first came into force on 5 April 2025.

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Subpart A — General

121.1 Purpose

This Part prescribes rules governing air transport operations and commercial transport operations using an aeroplane having a seating configuration of more than 30 seats, excluding any required crew member seat, or a payload capacity of more than 3410 kg.

121.3 Definitions

In this Part—

Air operation means an air transport operation or a commercial transport operation using an aeroplane having a seating configuration of more than 30 seats, excluding any required crew member seat, or a payload capacity of more than 3410 kg:

Air operator certificate means an airline air operator certificate:

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

Curriculum means a portion of an Advanced Qualification Programme that covers at least one of the following programme areas—

- (1) indoctrination; or
- (2) qualification that addresses the required training and qualification activities for a specific make, model, and series or variant of aeroplane and for a specific duty position; or
- (3) continuing qualification that addresses the required training and qualification activities for a specific make, model, and series of aeroplane or variant and for a specific duty position:

Exposition, unless used with reference to another source, means a record of the information required by rule 119.81 or 119.125:

Evaluator means a qualified flight examiner or person who has completed training and evaluation that qualifies the person to evaluate the performance of crew members, instructors, other evaluators, and other operations personnel, in an Advanced Qualification Programme:

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

Net take-off flight path, take-off flight path, take-off distance, and take-off run have the same meaning as prescribed in the rules under which the aeroplane was certificated:

Second-in-command means a pilot, other than the pilot-in-command, who is required by the flight manual for the operation of an aircraft.

Threshold means that point where a 1:20 obstacle-free approach surface intersects the runway surface.

121.5 Laws, regulations, and procedures

Each holder of an air operator certificate issued under Part 119 must 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 Procedure compliance

Each person performing an air operation must conform with the applicable procedures specified in the exposition of the holder of an air operator certificate that authorises the operation.

121.9 Crew member grace provisions

If a crew member completes a test, flight check, or assessment, that is required under Subparts I, J, or M within 60 days before the date on which the test, flight check, or assessment is required, the crew member is deemed to have completed the test, flight check, or assessment on the date that it is required to be completed.

121.11 *Reserved*

121.13 Exemptions

(a) The Director may not grant an exemption from a requirement under rule 121.381 or 121.383 if the exemption would extend by more than one year the date by which an aeroplane must be equipped with any of the following:

- (1) the applicable TAWS prescribed by rule 121.381;
- (2) an ACAS II prescribed by rule 121.383.

(b) Notwithstanding paragraph (a), the Director may not grant an exemption from —

- (1) the requirement under rule 121.381(b) or 121.383(b)(1) for an aeroplane with a passenger seating configuration of 40 or less seats if the details specified under rule 47.55(b) in respect of that aeroplane already appear in the New Zealand Register of Aircraft on 1 August 2003; or
- (2) the conditions to the requirements under rule 121.381(c) or 121.383(b)(2).

121.15 Applicability to air operations conducted under an Australian AOC with ANZA privileges

The following rules do not apply in the case of air operations conducted in New Zealand under an Australian AOC with ANZA privileges:

- (1) 121.79:
- (2) 121.81:
- (3) 121.83:
- (4) 121.89:
- (5) 121.91(a):
- (6) 121.91(b):
- (7) 121.803:
- (8) 121.805.

Subpart B — Flight Operations

121.51 Purpose

This Subpart prescribes the rules governing air operations.

121.53 Aeroplane airworthiness

Each holder of an air operator certificate must 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 applicable parts of the certificate holder's exposition are written.

121.57 Aeroplane proving flights

(a) Each holder of an air operator certificate that intends to introduce a new aeroplane type must, prior to that aeroplane type being used in air operations, ensure that a programme of proving flights 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) must 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) Each holder of an air operator certificate that intends to introduce into its operation an aeroplane type that has been materially altered in design since the last proving flights must, 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 powerplants of a type dissimilar to those installed at initial certification; or

- (2) alterations to the aeroplane or its components that materially affect flight characteristics.
- (e) Each holder of an air operator certificate that carries out an aeroplane proving flight must restrict the carriage of personnel during the flight to necessary crew members and to personnel who are—
- (1) receiving familiarisation or training; or
 - (2) gaining line operating flight time; or
 - (3) authorised to represent the Director.

121.59 Flight preparation

- (a) The holder of an air operator certificate must ensure that for each air operation conducted under the authority of the 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 before an air operation is conducted under the authority of that certificate, a flight plan meeting the requirements of rule 91.307(c) or 91.407 as appropriate for the type of operation is prepared, and if the flight plan is not prepared by the pilot-in-command, the pilot-in-command is informed of the contents of the flight plan before the intended operation.
- (c) A VFR flight plan prepared under paragraph (b) and meeting the requirements of rule 91.307(c) may incorporate multiple route segments provided that the SARTIME is amended for the next aerodrome of intended landing as the flight proceeds.
- (d) Where operations personnel prepare an operational flight plan, the holder of the air operator 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) Despite rule 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.

(g) Despite rules 91.307(a) and 91.407(a)(1), the flight plan required to be submitted to an ATS unit under paragraph (f) may be submitted by the holder of the air operator certificate and the pilot-in-command must be informed of the contents of the flight plan.

121.61 Operational flight plans

(a) When establishing the operational flight plan on which a flight schedule is to be based, each holder of an air operator certificate must 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 aeroplane's 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.

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

121.63 Search and rescue information

Each holder of an air operator certificate must, 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.

121.65 Emergency and survival equipment information

(a) Each holder of an air operator certificate must 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) must 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 certification

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 Minimum height for VFR flights

Rule 91.311(c) does not apply to a pilot-in-command performing air operations under this Part.

121.71 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 take-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; and
- (2) if the operation is a regular air transport service operating to, from, or outside of New Zealand—

- (i) a runway at an aerodrome within New Zealand that is used for the operation has a RESA at each end of the runway as required by Part 139 Appendix A.1; or
 - (ii) if the runway does not have a RESA as required in paragraph (i), the certificate holder must ensure that the take-off and landing performance calculations for the aeroplane are based on a reduction of the appropriate declared distances for the runway to provide the equivalent of a 90 m RESA at the overrun end of the runway strip; and
 - (iii) a runway at an aerodrome outside of New Zealand that is used for the operation has a RESA that extends to at least 150 m from the overrun end of the runway, or an engineered equivalent that is acceptable to the Director; or
 - (iv) if the runway does not have a RESA or an engineered equivalent as required in paragraph (a)(2)(iii), the certificate holder must ensure that the take-off and landing performance calculations for the aeroplane are based on a reduction of the appropriate declared distances for the runway to provide the equivalent of the RESA required in paragraph (a)(2)(iii) at the overrun end of the runway.
- (b) The certificate holder 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 has—
- (1) rescue fire equipment that is appropriate to the aeroplane type and is acceptable to the Director; and
 - (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.
- (c) The certificate holder 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) The certificate holder must ensure that the following matters are specified for each of the aerodromes or groups of aerodromes specified in the certificate holder's exposition 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.

(e) Despite paragraph (f)(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 30 passengers and is engaged on domestic air operations may be a non-certificated aerodrome.

(f) An 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 30 passengers and is engaged on a regular air transport passenger service must be an aerodrome that—

- (1) for New Zealand aerodromes, is associated with an aerodrome operator certificate issued under the Act and Part 139; or
- (2) for aerodromes outside New Zealand, is associated with a certificate that meets a standard that is equivalent to that required under Part 139 and issued by an ICAO Contracting State.

(g) The certificate holder must maintain a register, as part of the route guide, of aerodromes that are to be used in accordance with paragraphs (e) and (f), containing—

- (1) the aerodrome data; and
- (2) procedures for ensuring that the condition of the aerodrome is safe for the operation; and

- (3) procedures for ensuring that the condition of any required equipment, including safety equipment, is safe for the operation; and
 - (4) details of any limitations on the use of the aerodrome.
- (h) Except as provided in paragraph (i), the certificate holder must ensure that an aeroplane performing an air operation under the authority of the holder's certificate does not land on 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 Appendix C for the aeroplane; and
 - (2) the width of the runway strip for the runway to be used is at least that width determined in accordance with Table C-1 of Appendix C of Part 139 for the aeroplane and the runway type.
- (i) A runway that has a width that is less than that required under paragraph (h) may be used by an aeroplane performing an air operation under the authority of the holder's certificate if—
- (1) a lesser minimum runway width, determined by certificated flight testing, is prescribed in the aeroplane's flight manual; or
 - (2) a lesser minimum runway width was prescribed in the certificate holder's air service certificate, issued under regulation 136 of the Civil Aviation Regulations 1953 before 6 January 1993, for the aeroplane.

121.73 Night operations

A person must not perform an operation at night under VFR.

121.75 Fuel

- (a) Each holder of an air operator certificate must establish a fuel policy for the purpose of flight planning, and inflight replanning, to ensure that each aeroplane carries sufficient fuel for the planned operation, including reserves to cover deviations from the planned flight.
- (b) The fuel policy must 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 aeroplane's 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
 - (iii) 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 must ensure that the calculation of usable fuel required for an operation takes into account the following factors—
- (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) final-reserve fuel; 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 is provided for in the certificate holder's exposition.

121.77 Flight check system

(a) A holder of an air operator certificate must 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 flight crew compartment; and
- (2) methods used to conduct the flight safely.

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

- (1) contained in the aeroplane flight manual; and
- (2) contained in the manufacturer's technical and safety instructions; and
- (3) of crew resource management; and
- (4) of human factors and psychology; and
- (5) of ergonomics.

(c) The certificate holder must ensure that the system includes—

- (1) an expanded checklist in the operations manual; and
- (2) scan checks; and
- (3) a quick reference handbook; and
- (4) a checklist for procedures, including emergency procedures.

(d) The certificate holder must ensure that the system contains procedures, available for use at each flight crew member's duty station, to be followed by them—

- (1) prior to and during take-off; and
- (2) in flight; and
- (3) on landing; and

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

121.79 Emergency light operation

A person performing an air operation must ensure that each emergency light system required by Part 26 Appendix D is armed or turned on during taxiing, take-off, and landing.

121.81 Passenger safety

Each person performing an air operation must ensure that—

- (1) passengers are seated where, in the event of an emergency evacuation, they will not hinder 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 flight attendant, or the pilot-in-command, is notified when a disabled or escorted person is to be carried on board the aeroplane.

121.83 Passenger information

(a) A person performing an air operation must ensure that the Fasten Seat Belt sign is turned on—

- (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.
- (b) A person performing an air operation must ensure that passengers are informed, either by illuminated No Smoking signs or by approved No Smoking placards, when smoking is prohibited in the aeroplane.
- (c) If illuminated No Smoking signs are installed in an aeroplane, they must be lit when smoking is prohibited.

121.85 Flight crew compartment admission

- (a) A holder of an air operator certificate must ensure that at least one forward-facing observer's seat is available in the flight crew compartment, on an aeroplane performing air operations, that is suitable for use while conducting en-route inspections.
- (b) A person performing an air operation must ensure that no person, other than the flight crew members assigned to the flight, is admitted to, or carried in, the flight crew 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.
- (c) A person performing an air operation must ensure that all persons admitted to the flight crew compartment or occupying a pilot seat are familiarised with the appropriate safety procedures specified in the certificate holder's exposition.

121.87 Manipulation of controls

- (a) Each holder of an air operator certificate must ensure that no person is permitted to manipulate the flight controls of its aeroplanes that are performing air operations, unless the person is—

- (1) a flight crew member qualified in accordance with rule 121.505 and authorised by the certificate holder; or
 - (2) an authorised representative of the Director, qualified in accordance with rule 121.505, who—
 - (i) has the permission of the certificate holder and the pilot-in-command; and
 - (ii) is performing a required duty.
- (b) A person must not manipulate the controls of an aeroplane performing an air operation, unless the person is authorised in accordance with paragraph (a)(1) or (2).

121.89 Flight recorder requirements

- (a) Each flight crew member must ensure that—
- (1) the cockpit voice recorder required by rule 121.371 is operated continuously from the start of the checklist commenced before engine start until the completion of the final checklist at the termination of flight; and
 - (2) if the aeroplane is equipped to record the uninterrupted audio signals received from a boom or a mask microphone, the boom microphone is used below 10 000 feet altitude; and
 - (3) if the cockpit voice recorder has an erasure feature, that feature must not be used except for maintenance purposes or for a safety investigation.
- (b) Each flight crew member must ensure that—
- (1) the flight data recorder required by rule 121.373 is operated continuously from the instant the aeroplane begins to move under its own power until it has come to a complete stop at the termination of the flight; and
 - (2) it records and stores at least the last 25 hours of its operation in digital form; and

- (3) not more than 1 hour of recorded data is erased for the purpose of testing the flight recorder or the flight recorder system, or after a safety investigation; and
- (4) any erasure made under paragraph (b)(3) is—
 - (i) of the oldest recorded data accumulated at the time of testing, or safety investigation; and
 - (ii) recorded in the appropriate maintenance documentation.

121.91 Refuelling and defuelling operations

(a) Despite the requirements of rule 91.15(3), a person operating an aeroplane under the authority of an air operator certificate issued in accordance with Part 119 may refuel or defuel the aeroplane with a Class 3.1C or a Class 3.1D flammable liquid when a person is embarking, on board, or disembarking the aeroplane, provided the person operating the aeroplane ensures that safety and aeroplane evacuation precautions are taken in accordance with procedures specified in the certificate holder's exposition.

(b) A person operating an aeroplane under the authority of an air operator certificate issued in accordance with Part 119 may refuel or defuel the aeroplane with a Class 3.1C or a Class 3.1D flammable liquid 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 defuelling commences; and
- (2) the pilot-in-command is responsible for every aspect of the fuelling operation.

121.93 *Reserved*

121.95 Emergency situation action plans

(a) A holder of an air operator certificate must ensure action plans are developed for handling in-air and on-ground emergency situations and minimising risk of injury to persons.

(b) The certificate holder's emergency situation action plan must 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 holder's in-air emergency plan must 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 under paragraph (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 must ensure that appropriate staff are trained and competent to perform during emergencies in accordance with the emergency situation action plan.

121.97 Restriction or suspension of operations

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

121.99 Securing the flight crew compartment door

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.

121.101 Monitoring the area outside the flight crew compartment door

The pilot-in-command of an aeroplane performing an 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 area outside the flight crew compartment door is secure; and
- (2) the person seeking to have the flight crew compartment door opened is not being forced to do so.

121.103 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 flight attendant can discreetly notify a flight crew member if suspicious activity or a security breach is detected in the cabin.

Subpart C — Operating Limitations and Weather Requirements**121.151 Purpose**

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

121.153 Meteorological information

(a) A person performing an air operation must plan, perform, and control a flight using meteorological information provided for aviation purposes by—

- (1) subject to paragraph (b), for a flight sector originating within New Zealand, the holder of an aviation meteorological service organisation certificate issued in accordance with Part 174; or
- (2) for a sector originating from an aerodrome outside New Zealand, an aviation meteorological service organisation that—
 - (i) meets a standard equivalent to that specified by Part 174; and
 - (ii) is authorised by an ICAO Contracting State to provide aviation meteorological information.

(b) A pilot-in-command of an aeroplane may, for a flight sector that originates and terminates within New Zealand, use the meteorological information provided in a basic weather report to perform an instrument approach procedure if the holder of the air operator certificate under which the flight is operated is satisfied that the basic weather report is provided in accordance with the requirements of rule 174.6.

121.155 Meteorological conditions – VFR flight

(a) A person performing an air operation must ensure a VFR flight is not commenced unless current meteorological reports, or a combination of current reports and forecasts, indicate VFR minima prescribed in Part 91 and in paragraph (d) can be complied with along the route, or that part of the route to be flown under VFR.

(b) A person must not perform an extended over-water operation under VFR.

(c) A pilot-in-command performing VFR air operations outside controlled airspace must fly—

- (1) in meteorological conditions of not less than a ceiling of 1000 feet AGL and a flight visibility of not less than 5 km; and

- (2) beneath the ceiling, remaining clear of cloud, and in continuous sight of the ground or water; and
 - (3) above not more than scattered cloud.
- (d) A pilot-in-command must not carry out an air operation under VFR in a multi-engine aeroplane above more than scattered 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 inoperative, 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) 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 – IFR flight

- (a) A pilot-in-command of an aeroplane performing an air operation must not commence an operation under IFR unless current meteorological reports, or a combination of current meteorological reports and forecasts, indicate that conditions will—
- (1) at the estimated time of arrival at the applicable destination aerodrome, be at or above the minima published in the applicable AIP for the instrument procedure likely to be used at that aerodrome; or
 - (2) at the estimated time of use, at—
 - (i) one alternate aerodrome, meet the ceiling and visibility that are required by rule 91.405(a)(2); or

- (ii) two alternate aerodromes, meet the ceiling and visibility that are required by rule 91.405(b).
- (b) A pilot-in-command of an aeroplane must not commence an air operation under IFR unless at least one alternate aerodrome is available, that meets the ceiling and visibility that are required by rule 91.405(b), if—
- (1) the departure or destination aerodrome for the operation is outside New Zealand; and
 - (2) the destination aerodrome has less than two separate runways suitable for use by the aeroplane being used.

121.159 Aerodrome operating minima – IFR flight

- (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 course within the distance specified in the instrument approach procedure.

121.159A Aerodrome operating minima to be used for each aerodrome

- (a) A holder of an air operator certificate must ensure that a pilot-in-command performing an air operation must comply with the aerodrome operating minima that apply to the aerodrome, as published in the applicable AIP.

(b) The holder of an air operator certificate may increase the aerodrome operating minima by including the increased aerodrome operating minima in the certificate holder's exposition.

(c) A pilot-in-command who operates under increased aerodrome operating minima must comply with any requirements specified in the certificate holder's exposition in relation to the increased aerodrome operating minima.

121.161 IFR departure limitations

A person performing an air operation must ensure an IFR flight from an aerodrome is not commenced when weather conditions are at or above take-off minima prescribed under rule 91.413 and are below authorised IFR landing minima prescribed under rule 91.413, unless there is an appropriate aerodrome—

- (1) for an aeroplane having two engines, within a maximum of one hour flying time, in still air at one engine inoperative cruising speed, of the aerodrome of departure; or
- (2) for an aeroplane having three or more engines, within a maximum of two hours flying time, in still air at one engine inoperative cruising speed, of the aerodrome of departure.

121.163 Reduced take-off minima

(a) A holder of an air operator certificate may operate an aircraft at lower take-off minima than those prescribed in rule 91.413(f) if the certificate holder ensures that the operation is conducted in accordance with the reduced take-off minima procedure specified in the certificate holder's exposition.

(b) The reduced take-off minima procedure must require that—

- (1) the pilot-in-command and the second-in-command are qualified for reduced minima take-offs under rule 121.537; and
- (2) the runway to be used has centre-line marking or centre-line lighting; and
- (3) reduced take-off minima on the runway to be used are published in the applicable AIP; and

- (4) if the aeroplane is a 2 engine propeller-driven aeroplane, the aeroplane is equipped with an operative auto-feather or auto-coarse system; and
- (5) the runway visibility is established using RVR; and
- (6) 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 still air 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 authorised in accordance with Subpart N to conduct EDTO; and
- (3) the aeroplane is operated in accordance with applicable EDTO requirements prescribed in this Part.

(c) 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.

121.167 *Reserved***121.169 IFR procedures**

(a) A pilot-in-command of an aeroplane performing an air operation under IFR must conduct the operation on a route published in the applicable AIP, 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, a pilot-in-command must comply with any IFR departure and approach procedure published in the applicable AIP for the aerodrome being used.

(c) In uncontrolled airspace a pilot-in-command must comply with any IFR departure and approach procedure published in the applicable AIP for the aerodrome being used.

121.171 Requirement for air operations in a polar area

A holder of an air operator certificate must not conduct an air operation within a polar area unless authorised by the Director.

121.173 Application for air operations in a polar area

A holder of an air operator certificate applying for authorisation to conduct an air operation in a polar area must provide the Director with the following information at least 90 days before the intended air operation, or a lesser period acceptable to the Director:

- (1) details of the aerodromes in the polar area that meet the criteria for an EDTO alternate aerodrome and any special operational requirement that must be met at the time of a diversion to the aerodrome; and

- (2) a recovery plan at any aerodrome nominated under paragraph (1) as an alternate; and
- (3) a fuel freeze strategy and procedures for monitoring fuel freezing; and
- (4) a plan for ensuring that the communication capability required by rule 121.957(b)(2)(ii) is met during an air operation in a polar area; and
- (5) a training plan for an air operation in a polar area; and
- (6) a procedure for mitigating exposure of crew members to radiation during periods of solar flare activity; and
- (7) procedures for ensuring that at least 2 cold weather anti-exposure suits to protect crew members during outside activity at an aerodrome during severe climatic conditions are carried in any aeroplane operating in a polar area unless the Director determines that, due to seasonal weather conditions, anti-exposure suits are not required.

121.175 Authorisation for air operations in a polar area

The Director may amend the operations specifications required by rule 119.15 to authorise a holder of an air operator certificate to conduct an air operation in a polar area if the Director is satisfied that the details of the aerodromes and the information and procedures provided by the certificate holder under rule 121.173 are adequate for assuring the safety of the operation.

Subpart D — Performance

121.201 Purpose

(a) This Subpart prescribes aeroplane performance operating limitations applicable to—

- (1) aeroplanes used in air operations; and
- (2) aeroplanes, used in operations performed under Part 125 or Part 135, certificated to FAR Part 25 airworthiness standards, or equivalent airworthiness standards, that are—

- (i) propeller-powered aeroplanes with a seating configuration of 20 seats or more; or
 - (ii) multi-engine turbojet or turbofan powered aeroplanes.
- (b) Aeroplanes that cannot fully comply with the requirements of this Subpart may be approved to operate under alternative performance operating limitations.

121.203 *Reserved*

121.205 General performance

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

- (1) the take-off weight at the start of its 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 distance

(a) Each holder of an air operator certificate must 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 must, assuming that the critical engine fails at V_{EF} and using a single V_1 , ensure that—

- (1) the accelerate-stop distance required does not exceed the accelerate-stop distance available; and
 - (2) the take-off distance required does not exceed the take-off distance available; and
 - (3) any clearway forming part of the take-off distance available does not exceed half the length of the take-off run available; and
 - (4) in the case of a wet or 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 V_1 ; and
 - (5) the take-off run required does not exceed the take-off run available using V_1 for the rejected and continued take-off; and
 - (6) on a wet or contaminated runway, the take-off weight does not exceed that permitted for a take-off on a dry runway under the same conditions.
- (c) When calculating the maximum take-off weight in accordance with paragraph (b), the certificate holder must 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

Each holder of an air operator certificate must ensure that, unless performance data is available, the take-off distance calculated for a runway surface type under rule 121.207(c)(4) and the landing distance calculated

under rule 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 Factor	Accelerate Stop Distance Factor	Landing Distance Factor
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) Each holder of an air operator certificate must 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 to use 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 rule 121.207(b)(4); and
- (3) 50 feet in the case of a take-off performed by an aeroplane that is intended to use 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 rule 121.207(b)(4).

(b) For the purpose of paragraph (a), an obstacle is 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 for the 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 for the 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.

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

(d) When calculating the net take-off flight path in accordance with paragraph (a), the certificate holder must 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 varies by 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 rule 121.213.
- (e) The certificate holder must 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 an alternate aerodrome required by rule 121.161.

121.213 Engine inoperative – gradient and stall corrections

Each holder of an air operator certificate must, unless performance data is available, for compliance with rule 121.211(d)(4)(iii), retain 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°	V_2	1 x Aeroplane flight manual 15° gradient loss
20° to 24°	$V_2 + 5$ knots	2 x Aeroplane flight manual 15° gradient loss
25°	$V_2 + 19$ knots	3 x Aeroplane flight manual 15° gradient loss

121.215 En-route critical engine inoperative

(a) Each holder of an air operator certificate must 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 (b), 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 (b), 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 rule 121.221 or rule 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.
- (b) If the pilot is able, by the use of radio navigation aids, to maintain the intended track by a margin of 5 NM the distance of 10 NM required by paragraphs (a)(1) and (2) may be reduced to 5 NM.

121.217 En-route – 90 minute limitation

- (a) Except as provided in paragraph (b), each holder of an air operator certificate must 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 point where two engines are assumed to fail simultaneously, to an aerodrome at which it is possible to land using the prescribed procedure for a landing with two 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 is not less than that which would include sufficient fuel to 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, 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 must assume the 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

Each holder of an air operator certificate must 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 rule 121.211.

121.221 Landing distance - runways

- (a) A holder of an air operator certificate must 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 holder of an air operator certificate must, calculate the landing distance for an aeroplane on a runway using either –
 - (1) procedures that have been approved under paragraph (c); or
 - (2) the procedures provided in Appendix D.
- (c) The Director may approve an application by a holder of an air operator certificate for procedures referred to in paragraph (b)(1) if satisfied of the following matters —
 - (1) that the aeroplane proposed has performance data issued by the manufacturer that supports the procedures and is available for use by the pilot or flight crew members; and
 - (2) that the operator has reliable access to either –
 - (i) accurate reporting on runway conditions that is appropriate for the procedures to be used; or

- (ii) data that enables the operator to identify equivalent conditions; and
- (3) that the margin of error applied when calculating landing distance using the permitted procedures takes into account the following –
 - (i) the implications of pilot technique on landing distance;
 - (ii) the implications of unexpected environmental conditions at the destination aerodrome;
 - (iii) whether the calculation is being undertaken at the dispatch stage or en-route;
 - (iv) whether the margin of error is supported by the reporting of the runway conditions; and
- (4) that all personnel involved in the reporting of runway conditions, calculation of data and operation of the flight have had appropriate training in the use of the procedures.

121.223 *Reserved*

121.225 Steep approach and short landing techniques

A holder of an air operator certificate 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, if—

- (1) the aeroplane flight manual states the maximum authorised approach slope angle, any other limitations, procedures, including emergency procedures, for the steep approach, as well as amendments for the field length data when using steep approach criteria; and
- (2) for air operations performed under IFR, an approach slope indicator system comprising at least a visual approach slope indicating system is available for the runway to be used at the aerodrome at which steep approach procedures are to be conducted; and

- (3) for air operations performed under IFR, weather minima are specified and approved for each runway to be used with a steep approach; and
- (4) for air operations performed under IFR, consideration is given to—
 - (i) obstacles; and
 - (ii) the type of approach slope indicator reference and runway guidance such as visual aids, MLS, GNSS, ILS, LOC, 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 familiarisation; 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 New Zealand where actual weights are unable to be obtained, a standard weight that is established by 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 is used.

121.305 Aeroplane load limitations

A holder of an air operator certificate must 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 aeroplane's 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 the 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 aeroplane's 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, except where this is recorded by the certificate holder in another document:
- (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.

121.353 General

(a) Except as provided in paragraph (b), a holder of an air operator certificate must ensure that an air transport 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 New Zealand and for which the individual airworthiness certificate is first issued after 1 July 2008 either:
 - (A) 3 ELTs, 1 of which must be an ELT(AF); or
 - (B) at least 2 ELTs and a capability to autonomously transmit information from which a position can be determined by the operator at least once every minute, when in distress; 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, does 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—
- (i) the applicable specifications and airworthiness design standards listed in the following:
 - (A) Appendix B to this Part:
 - (B) Appendix C to Part 21:
 - (C) Part 26; or
 - (ii) an alternative specification or design standard acceptable to the Director; and
- (3) the instruments and equipment have been installed in accordance with the aeroplane manufacturer's instructions or equivalent instructions acceptable to the Director; and

- (4) except as may be provided by a MEL approved under rule 91.539 for use for the aeroplane, the instruments and equipment installed in the aeroplane are in operable condition.
- (aa) Each ELT referred to in paragraph (a)(1)(ii) must meet the relevant standard referred to in A.15 of Appendix A to Part 91.
- (b) A holder of an air operator certificate is not required to equip an aeroplane with an AELS as required by rule 91.529(a) if—
- (1) the individual airworthiness certificate for the aeroplane was first issued before 1 July 2008; and
 - (2) the aeroplane is performing a regular air transport service to, from, and within countries outside of New Zealand; and
 - (3) the aeroplane is equipped with 2 ELTs of any type that meet the requirements prescribed in A.15 of Appendix A to Part 91 instead of the AELS required by rule 91.529(a).

121.355 Additional instruments

Each holder of an air operator certificate must ensure that each of its aeroplanes is equipped with—

- (1) the powerplant instruments required by the airworthiness design standards in paragraph (a)(1)(ii) of Appendix C of Part 21; and
- (2) a means of indicating for each reversible propeller, actuated by the propeller blade angle or directly responsive to it, that the propeller is in beta range or reverse pitch.

121.357 Additional equipment

(a) A holder of an air operator certificate must ensure that an aeroplane operated under the authority of the certificate 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 a person from opening it without the permission of the pilot-in-command; 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.
- (b) A holder of an air operator certificate who conducts an air transport operation carrying passengers must ensure that—
 - (1) the door required by paragraph (a)(2)—
 - (i) meets the requirements of USA Title 14 Code of Federal Regulations §25.795(a)(1), (2), and (3) in effect on 15 May 2009; and
 - (ii) can be locked and unlocked from either pilot seat; and
 - (2) a means is provided for monitoring the area outside the flight crew compartment for the purpose of identifying a person requesting entry to the flight crew compartment, or for detecting suspicious behaviour or a potential threat.
- (c) *Reserved*
- (d) A holder of an air operator certificate must ensure that a signal or confirmation system associated with a method established for communications between a flight attendant and a flight crew member is operable from each flight crew member seat.

121.359 Night flight

A holder of an air operator certificate must ensure that an aeroplane operated at night is equipped with—

- (1) two landing lights; and
- (2) a light in each passenger compartment.

121.361 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:
 - (ii) a means of indicating sensitive pressure altitude, calibrated in feet; and
- (2) spare bulbs for flight crew compartment instrument illumination; and
- (3) spare fuses.

(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 indicating airspeed required by paragraph (a)(1)(i).

121.363 Flights over water

A holder of an air operator certificate must ensure that each of the certificate holder's aeroplanes operated on an extended over-water operation is equipped with sufficient liferafts with buoyancy and overload capacity to accommodate every occupant of the aeroplane in the event of a loss of one liferaft of the largest rated capacity.

121.365 Emergency equipment

- (a) Each holder of an air operator certificate must ensure that—
- (1) notwithstanding the seat breaks in rules 91.523(a) and (b), each of its aeroplanes is equipped with the emergency equipment referred to in rule 91.523; and
 - (2) the requirements in rules 91.523(d) and (e) are met for the equipment required by paragraph (a)(1).

(b) Each holder of an air operator certificate must ensure that each of its aeroplanes operated on flights of more than 120 minutes duration is equipped with an emergency medical kit, suitable for use by qualified medical personnel, that contains items that provide for the treatment of injuries and medical emergencies.

121.367 Protective breathing equipment

A holder of an air operator certificate must ensure that every 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 their normally seated position; and
 - (ii) crew member; and
- (2) is installed—
 - (i) in the flight crew compartment; and
 - (ii) in every passenger compartment within 1 metre of each required hand held fire extinguisher or at some other distance from the fire extinguisher that is acceptable to the Director; and
 - (iii) in a galley that contains a hand held fire extinguisher; and
- (3) is accessible to crew outside each Class A, B and E cargo compartment.

121.369 Public address and crew member intercom systems

Each holder of an air operator certificate must ensure that each of its aeroplanes is equipped with—

- (1) a public address system; and
- (2) a crew member intercom system.

121.371 Cockpit voice recorder

A holder of an air operator certificate must ensure that an aeroplane is equipped with a cockpit voice recorder as specified in Appendix B.5.

121.373 Flight data recorder

A holder of an air operator certificate must ensure that an aeroplane is equipped with a flight data recorder as specified in Appendix B.6.

121.375 Additional attitude indicator

Each holder of an air operator certificate must ensure that each of its turbojet or turbofan powered aeroplanes is equipped with a third presentation of attitude.

121.377 Weather radar

Each holder of an air operator certificate must ensure that each of its turbine powered aeroplanes operating under IFR is equipped with a weather radar.

121.379 Ground proximity warning system

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

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

121.381 Terrain awareness and warning system (TAWS)

(a) A holder of an air operator certificate must ensure that a turbine powered aeroplane manufactured on or after 1 April 2002 and being operated under that certificate is equipped with a TAWS Class A.

(b) A holder of an air operator certificate must ensure that a turbine powered aeroplane manufactured before 1 April 2002 and being operated under that certificate is equipped with a TAWS Class A.

(c) *Reserved*

(d) A holder of an air operator certificate must ensure that a piston powered aeroplane being operated under that certificate is equipped with a TAWS Class B.

121.383 Airborne Collision Avoidance System (ACAS II)

A holder of an air operator certificate must ensure that an aeroplane being operated under that certificate is equipped with ACAS II.

Subpart G — Maintenance**121.401 Purpose**

This Subpart prescribes rules for aeroplane maintenance for each holder of an air operator certificate.

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 in 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 a maintenance reliability report that contains details of—

- (1) aeroplane utilisation; 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 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 119.63 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 for an 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 authorised 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 on an 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 action on 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.

121.409 Reserved**121.411 Reserved****121.413 Reserved****121.415 Maintenance review**

- (a) A holder of an air operator certificate must ensure that—
- (1) an aeroplane is not operated under the authority of the certificate unless a maintenance review for the aeroplane has been carried out within the previous 12 months; and
 - (2) each maintenance review that is carried out is certified in accordance with paragraph (d).
- (b) Except as provided in paragraph (c), the holder of an air operator certificate must ensure that a maintenance review for an aeroplane is not certified as having been carried out unless, since the last maintenance review—
- (1) due maintenance specified in the applicable maintenance programme for the aeroplane has been completed within the time period specified; and
 - (2) every applicable airworthiness directive has been complied with in accordance with the requirements prescribed in Part 39; and
 - (3) every defect entered in the technical log has been rectified or properly deferred in accordance with the procedures in the certificate holder's exposition; and
 - (4) every applicable certification for release-to-service has been made in accordance with Subpart C of Part 43.
- (c) The certificate holder may certify a maintenance review for an aeroplane on the basis of continuing compliance with a programme acceptable to the Director if—
- (1) the programme samples every requirement of paragraph (b) during the review period; and
 - (2) the maintenance review is individually certified for each of the certificate holder's aeroplanes.

(d) The certificate holder must ensure that the person who carries out a maintenance review for an aeroplane—

- (1) is authorised by the certificate holder and has experience, that is at least equivalent to the experience required for the grant of an appropriate aircraft maintenance engineer licence rating, for the type of aeroplane; and
- (2) carries out the review in accordance with the applicable paragraph (b) or (c); and
- (3) certifies that the maintenance review has been carried out by entering the following statement in the appropriate maintenance logbook with the person's signature, authorisation number, and the date of entry:

The maintenance review for this aeroplane and such of its equipment as is necessary for its continued airworthiness has been carried out in accordance with the requirements of Civil Aviation Rule 121.415.

121.417 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 assignment of crew members on an aeroplane conducting an air operation under the authority of an air operator certificate.

121.503 Assignment of crew members

- (a) A holder of an air operator certificate must, for each aeroplane type operated under the authority of the certificate, assign in writing to each crew member, the operational and safety functions that each crew member is to perform during an air operation.
- (b) The certificate holder must ensure that a person is not assigned to perform the function of a crew member on an aeroplane operating under the authority of the certificate unless that person—
 - (1) has completed the applicable training programme under Subpart I and is assessed as competent for the crew member position under Subpart J; or

- (2) if a pilot acting as a flight crew member, completing the pilot line training under rule 121.567 or pilot consolidation under rule 121.569,—
 - (i) has completed the applicable segments of the training programme under Subpart I; and
 - (ii) is assessed as competent for the flight crew member position under Subpart J; or
 - (3) is participating in, and is assessed as competent in accordance with an advanced qualification programme under Subpart M.
- (c) The certificate holder must not require a crew member to perform any duty during a critical phase of a flight that is not required for the safe operation of the aeroplane.
- (d) For the purpose of paragraph (c), a critical phase of a flight includes—
- (1) for flight crew members, all operations involving push back, taxi, take-off, approach and landing, and any other period when the aeroplane is operated below a height of 10 000 feet above ground level except when in cruise flight; and
 - (2) for flight attendants, all ground operations after leaving the apron area to join a main taxiway, take-off until passing a height of 1000 feet above ground level on climb, and the approach and landing phase of flight after the aeroplane has descended below a height of 5000 feet above ground level.

121.505 Flight crew duty assignment

- (a) A holder of an air operator certificate must, for an air operation conducted under the authority of the certificate, assign in writing—
- (1) a pilot who meets the requirements referred to in rule 121.507 as the designated pilot-in-command; and
 - (2) any additional pilot who is required by the flight manual for the operation of the aeroplane and who must meet the requirements referred to in rule 121.507 or rule 121.509; and

- (3) any other pilot, qualified to act as pilot-in-command or as an additional pilot under paragraph (a)(2), who is required by the type of operation to be performed to augment the minimum flight crew specified in the aeroplane flight manual; and
 - (4) if required by the type of operation, either—
 - (i) a flight engineer who meets the requirements referred to in rule 121.513; or
 - (ii) a cruise relief pilot who meets the requirements referred to in rule 121.511; or
 - (iii) both a flight engineer, and a cruise relief pilot.
- (b) If the number of pilots required by paragraphs (a)(1), (2), and (3) is more than 2, the certificate holder must assign in writing which of the pilots required by paragraphs (a)(2) or (3) will act as pilot-in-command if the designated pilot-in-command becomes incapacitated.

121.507 Pilot-in-command experience requirements

A holder of an air operator certificate 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 of which at least 50 hours must be acquired in actual flight; and
- (5) for night operations, has acquired at least 100 hours of night-flight time experience.

121.509 Second-in-command experience requirements

A holder of an air operator certificate must not designate a pilot to act as second-in-command of an aeroplane 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 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, if the pilot-in-command becomes 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 at a suitable alternate aerodrome.

121.511 Cruise relief pilot experience requirements

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.

121.513 Flight engineer experience requirements

A holder of an air operator certificate must not designate a person to act as a flight engineer on an aeroplane conducting an air operation under the authority of the certificate unless the person holds—

- (1) a current flight engineer licence with an applicable aircraft type rating and has successfully completed the applicable training and competency requirements specified in Subparts I and J; or
- (2) a current cadet flight engineer licence and is under the direct supervision of a flight engineer who holds a current flight engineer instructor rating with an applicable aircraft type rating and who has successfully completed the applicable training and competency requirements specified in Subparts I and J.

121.515 Flight attendant experience requirements

A holder of an air operator certificate must not designate a person to perform the functions of a flight attendant on an aeroplane operating under the authority of the certificate unless the person has satisfactorily completed the

appropriate segments of the crew member training programme required by rule 121.553 for the aeroplane type and the assigned crew member position.

121.517 Line supervisory pilot experience requirements

A holder of an air operator certificate must not designate a person to perform the functions of a line supervisory pilot unless that person—

- (1) is qualified to act as pilot-in-command of the aeroplane type performing an air operation under the authority of the certificate; and
- (2) holds a Category D flight instructor rating or an airline flight instructor rating referred to in Part 61; and
- (3) has acquired at least 2000 hours of flight time experience as a pilot including—
 - (i) 200 hours line operating flight time experience for the particular aeroplane type involved; or
 - (ii) 100 hours exercising the privileges of an airline flight instructor rating, referred to in Part 61, supervising pilots completing consolidation in an air operation on another aeroplane type under Subpart I or Subpart M; 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.

121.519 Pilot instructor experience requirements

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

- (1) is qualified to act as pilot-in-command of the aeroplane type performing the air operation under the authority of the certificate; and
- (2) holds a Category D flight instructor rating, or an airline flight instructor rating referred to in Part 61; and

- (3) has acquired at least 3000 hours of flight time experience 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 Category D flight instructor or an airline flight instructor rating, referred to in Part 61, instructing pilots on another aeroplane type under Subpart I or Subpart M; 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.

121.521 Flight examiner experience requirements

A holder of an air operator certificate must not designate a pilot to perform the function of a flight examiner in a route check required by rule 121.567(e)(3), rule 121.569(a)(3), or in a competency assessment programme required by Subpart J unless that pilot—

- (1) holds a current airline flight examiner rating referred to in Part 61; and
- (2) is qualified to act as pilot-in-command of the aeroplane type performing an air operation under the authority of the certificate; and
- (3) has acquired—
 - (i) 200 hours exercising the privileges of Category D flight instructor rating or an airline flight instructor rating, referred to in Part 61, for the particular aeroplane type involved; or
 - (ii) 100 hours exercising the privileges of an airline flight examiner rating, referred to in Part 61, on an aeroplane type to which this Part applies; or
 - (iii) other suitable experience on an aeroplane type applicable to this Part or Part 125 as acceptable to the Director; 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.

121.523 Simulator instructor and examiner experience requirements

(a) Except as provided in paragraphs (b) and (c), a holder of an air operator certificate must not designate a pilot to perform the function of a pilot instructor, or flight examiner for the purpose of giving flight instruction or conducting a flight crew member competency assessment in a flight simulator unless the pilot—

- (1) meets the appropriate requirements referred to in rule 121.519 or 121.521; and
- (2) demonstrates competency as pilot-in-command in the flight simulator to the standard required by Subpart J; and
- (3) has received proficiency training in the operation of the flight simulator; 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) A pilot who has previously met the requirements referred to in paragraph (a) but who no longer holds a current medical certificate may act as a pilot instructor or flight examiner in a flight simulator if the pilot maintains competency by—

- (1) undergoing training as a flight crew member in a flight simulator in accordance with the training programme required by rule 121.553; and
- (2) completing a competency assessment under Subpart J; and
- (3) completing the applicable training requirements which are otherwise necessary to maintain the currency of an airline instructor rating, or flight examiner rating, under Part 61 and this Part.

(c) Despite paragraph (a), if the certificate holder applies to the Director in writing, the Director may approve a pilot, who does not hold a medical certificate and who has not previously met the requirements referred to in rules 121.519 or 121.521, to exercise the functions of a pilot instructor or flight examiner in a flight simulator if the pilot—

- (1) has at least 5000 hours flight time experience in air operations; and
- (2) satisfactorily completes the training and competency requirements of Subpart I and J in a flight simulator of the aeroplane type; and
- (3) satisfactorily completes a course in flight instruction or flight examination that is acceptable to the Director; and
- (4) receives proficiency training in the operation of the flight simulator; and
- (5) continues to maintain competency as specified in paragraph (b).

121.525 Flight attendant trainer experience requirements

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

- (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 flight attendant competency in the technical and non-technical aspects of aircraft operation including human factors and crew resource management.

121.527 Flight attendant assessor experience requirements

A holder of an air operator certificate must not designate a flight attendant to perform the function of a flight attendant assessor for the purpose of rule 121.611 unless the flight attendant—

- (1) has completed the training segments and course referred to in rule 121.525; and

- (2) is qualified as specified in rule 121.575.

121.529 Ground instructor experience 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) a human factors course acceptable to the Director; and
- (3) a comprehensive training course in the subject matter area in which instruction is being provided.

121.531 Flight crew member pairing limitations

(a) Except if authorised under paragraph (b), a holder of an air operator certificate must ensure that an air operation is not conducted unless at least one of the flight crew members has accumulated the following flight time experience after completing the training and consolidation requirements of Subpart I—

- (1) 75 hours in the aeroplane type that is being operated; or
- (2) 75 operating cycles in the aeroplane type that is being operated.

(b) If a certificate holder applies to the Director in writing, the Director may authorise the certificate holder to deviate from the requirements of paragraph (a) by amending the operations specifications as appropriate in any of the following circumstances:

- (1) a new certificate holder who cannot meet the minimum requirements prescribed in paragraph (a);
- (2) an existing certificate holder acquires an aeroplane type not previously authorised by the Director for use in its operations.

(c) If a flight crew member is participating in an advanced qualification programme required by Subpart M, the flight time experience referred to in paragraph (a) apply.

121.533 Pilot operating limitations

(a) A holder of an air operator certificate must ensure that for an air operation conducted under the authority of the certificate, the pilot flying during each take-off and each landing is—

- (1) the pilot-in-command; or
- (2) subject to paragraph (c), a pilot other than the pilot-in-command.

(b) If a cruise relief pilot is designated for an air operation under rule 121.505(a)(4), the holder of the air operator certificate must ensure that the cruise relief pilot does not occupy 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.

(c) The holder of an air operator certificate must establish procedures for ensuring that a pilot, other than the pilot-in-command, acting as pilot flying during the take-off or landing of an aeroplane is—

- (1) competent to perform the particular take-off or landing; and
- (2) supervised by the pilot-in-command.

(d) The procedures required by paragraph (a) 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.

121.535 Flight crew operating multiple aeroplane types or variants

(a) If a holder of an air operator certificate assigns a flight crew member to operate more than one aeroplane type or more than one variant of an aeroplane type, the certificate holder must—

- (1) ensure that the flight crew member is trained and qualified to operate each aeroplane type or variant; and
- (2) establish training and competency assessment procedures acceptable to the Director.

(b) The holder of an air operator certificate must ensure that the procedures required by paragraph (a)(2) provide for the following—

- (1) before the flight crew member is assigned to operate more than one aeroplane type or variant, the flight crew member has the relevant experience necessary to operate the aeroplane type or variant taking into account the aircraft manufacturer's recommendations; and
- (2) a flight crew member has the sufficient experience required on one aeroplane type or variant before beginning training for another aeroplane type or variant, taking into account the manufacturer's recommendations; and
- (3) the flight crew member who is qualified on one aeroplane type or variant is trained and qualified on another aeroplane type or variant ; and
- (4) the flight crew member—
 - (i) has the applicable competency and recent flight experience requirements for each aeroplane type or variant; or

- (ii) satisfactorily completes a competency assessment on one specified aeroplane type or variant that is deemed to meet the competency standard on another specified aeroplane type or variant; and
 - (iii) for the purpose of paragraph (ii), the specified aeroplane types or variants must be recommended by the aeroplane manufacturer.
- (c) The relevant experience referred to in paragraph (b)(1) must include the minimum flight time experience or operating cycles a flight crew member must complete in air operations to which this Part applies.
- (d) The experience referred to in paragraph (b)(2) must include—
 - (1) the minimum flight time experience or operating cycles a flight crew member must complete in the aeroplane type already flown to which this Part applies; and
 - (2) the minimum number of hours a flight crew member must complete exclusively on the new aeroplane type or variant after commencing training for the new aeroplane type or variant.
- (e) The training and competency assessment procedures required by paragraph (a)(2) for a flight crew member to operate on more than one aeroplane type or different types of aeroplane with similar characteristics, must take into account at least the following:
 - (1) the aeroplane operating procedures; and
 - (2) the aeroplane systems; and
 - (3) the aeroplane performance limitations; and
 - (4) the aeroplane handling characteristics.
- (f) Despite rule 61.37, a holder of an air operator certificate must ensure that a flight crew member other than a cruise relief pilot, assigned to act as a flight crew member on multiple aeroplane types or variants, meets—
 - (1) the recent flight experience required by Part 61 for each aeroplane type or variant; or

- (2) the recent flight experience requirements for each aeroplane type or variant as specified in the procedures required by paragraph (a)(2).

121.537 Flight crew conducting Category II or III precision approach and reduced take-off minima

(a) A holder of an air operator certificate must ensure that the pilots of an aeroplane conducting an air operation under the authority of the certificate do not perform a Category II or Category III precision approach procedure, or a departure with reduced take-off minima, unless both the pilot-in-command and the pilot acting as second-in-command are qualified to perform the particular approach procedure or departure.

(b) For the purpose of paragraph (a)—

- (1) where the pilot-in-command is qualified only as pilot flying for the Category II or III precision approach and reduced take-off minima, the pilot-in-command must conduct the particular approach procedure and reduced take-off minima departure as pilot flying; and
- (2) where the second-in-command is qualified only as the pilot non-flying for the Category II or III precision approach and reduced take-off minima, the pilot-in-command must conduct the particular approach procedure and reduced take-off minima departure as pilot flying.

(c) Despite paragraph (b), the pilot of an aeroplane may perform a Category II or III precision approach procedure or a departure with reduced take-off minima as pilot flying or pilot non-flying for the particular approach and take-off if —

- (1) the pilot-in-command and the second-in-command are qualified as specified in paragraph (a); and
- (2) the pilot-in-command is—
 - (i) a line supervisory pilot qualified as specified in rule 121.517; or
 - (ii) a pilot instructor qualified as specified in rule 121.519; or

- (iii) a flight examiner qualified as specified in rule 121.521.

121.539 Flight attendants duty assignment

(a) A holder of an air operator certificate must ensure that an aeroplane is not operated on an air operation carrying passengers under the authority of the certificate unless the minimum number of flight attendants carried as crew members—

- (1) is as specified by the manufacturer’s recommended emergency evacuation procedures for the aeroplane configuration being used; and
- (2) is as specified by the certified design criteria for the aeroplane; and
- (3) will ensure at least 1 flight attendant is present in each occupied compartment; and
- (4) is in accordance with the minimum number specified in Table 3.

Table 3. Required flight attendants

Aeroplane Passenger Capacity:	Flight Attendants required
15 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
More than 500	12 plus 1 for every additional 50 passengers or component of 50 passengers in excess of 500

- (b) The certificate holder must designate—

- (1) for each air operation requiring 2 or more flight attendants, a senior flight attendant responsible to the pilot-in-command for the operational and safety functions of each flight attendant; and
 - (2) for each air operation requiring 6 or more flight attendants, a deputy senior flight attendant.
- (c) Despite paragraph (a)(4), the number of flight attendants required by Table 3 may be reduced by 1 to allow an air operation to continue if a required flight attendant becomes unfit because of sickness or injury during a duty period, if —
- (1) the requirements of paragraphs (a)(1), (2), and (3) can be met; and
 - (2) the remaining flight attendants are trained and competent to operate safely with one less flight attendant in accordance with the procedures specified in the certificate holder's exposition; and
 - (3) a flight attendant meeting the requirements referred to in rule 121.515 is available to replace the unfit flight attendant at the first aerodrome of landing .

Subpart I — Training

121.551 Purpose

This Subpart prescribes rules governing the establishment and implementation of training programmes specified in this Subpart for flight crew members and flight attendants who are not participating in an advanced qualification programme specified in Subpart M.

121.553 Crew member training programme

- (a) A holder of an air operator certificate must establish a crew member training programme under this Subpart to ensure that each flight crew member and each flight attendant assigned to act as a crew member on an aeroplane conducting an air operation, and who is not participating in an advanced qualification programme specified in Subpart M, is trained to perform their assigned functions.
- (b) The certificate holder must ensure that the training programme required by paragraph (a) is conducted safely, in a structured manner, and without unacceptable risk to the equipment and personnel, or third parties.

(c) The certificate holder must ensure that the training programme required by paragraph (a) contains the following segments—

- (1) introduction training;
- (2) transition training;
- (3) upgrade training;
- (4) recurrent training.

(d) The certificate holder must ensure that the training programme required by paragraph (a) includes human factors as an integral component in every training segment referred to in paragraph (c).

(e) The certificate holder must ensure that a pilot who completes an introduction training segment, a transition training segment, or an upgrade training segment also completes the pilot line training requirements specified in rule 121.567, and the pilot consolidation requirements specified in rule 121.569.

(f) The certificate holder must ensure that the person responsible for its flight crew training programme holds a flight examiner rating.

(g) The certificate holder must ensure that the person responsible for its flight attendant training programme is qualified as specified in rule 121.525, or rule 121.527, or has appropriate qualifications and experience that are acceptable to the Director.

(h) The certificate holder is responsible for controlling the training programme required by paragraph (a).

(i) The certificate holder may—

- (1) conduct the training in accordance with the training programme required by paragraph (a); or
- (2) contract with the holder of an aviation training organisation certificate issued under Part 141, to conduct the training in accordance with the training programme required by paragraph (a) if the Part 141 certificate authorises the holder to conduct that type of training; or

- (3) for a training conducted outside New Zealand, contract with an organisation that meets a standard equivalent to that specified in Part 141 to conduct the training in accordance with the training programme required by paragraph (a) for flight crew members.
- (j) The certificate holder must ensure that when a crew member completes a training segment of the training programme—
- (1) the training record for that crew member is updated with the details of the qualification acquired; and
 - (2) the training record and details of the qualification referred to in paragraph (1) are kept in accordance with the procedures referred to in rule 119.67; and
 - (3) the crew member is informed of the qualification.

121.555 Syllabus for crew member training programme

- (a) A holder of an air operator certificate must ensure that each segment of the training programme for flight crew members and flight attendants includes 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) the crew member assignments, functions, responsibilities, and the relationship of these to the assignments, functions and responsibilities of other crew members, particularly in regard to abnormal or emergency procedures:
 - (4) training in all types of emergency and abnormal situations or procedures caused by power plant, airframe or system malfunctions, fire or other abnormalities:
 - (5) the location and operation of emergency equipment available for use by crew members:

- (6) the location and use of oxygen equipment:
- (7) the location and use of all normal and emergency exits, including evacuation slides and escape ropes:
- (8) training on human factors and crew resource management:
- (9) training in strategies to manage risks including threat and error management:
- (10) the requirements of Part 92 regarding the carriage of dangerous goods:
- (11) security training in accordance with the air operator security programme required by rule 119.75:
- (12) the certificate holder's policies and procedures appropriate to its air operations.

121.557 Crew member introduction segment

(a) Subject to paragraphs (b) and (c), a holder of an air operator certificate must ensure that a pilot or flight attendant who is not qualified and currently serving as a crew member in an air operation under the authority of the certificate, completes the introduction segment of the training programme required by rule 121.553, and in accordance with the syllabus required by rule 121.555.

(b) The certificate holder may, with prior acceptance of the Director, vary the syllabus of the introduction segment of the training programme in the holder's exposition for a crew member if details of the variation and the reasons for the variation are recorded and certified 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.

121.559 Crew member transition segment

(a) Subject to paragraph (b), a holder of an air operator certificate must ensure that a pilot or flight attendant who is qualified and currently acting as a crew member on an air operation under the authority of the certificate completes the transition segment of the training programme required by rule 121.553 if—

- (1) the crew member is changing from one aeroplane type or variant to another type or variant ; or
- (2) there is a change to the nature of the operation, or new equipment is introduced, which affects the operation of the aeroplane type or variant.

(b) The transition segment of the training programme referred to in paragraph (a) must address at least the following—

- (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.

121.561 Crew member upgrade segment

(a) Subject to paragraph (b), a holder of an air operator certificate must ensure that a pilot or flight attendant who is qualified and currently acting as a crew member on an air operation conducted under the authority of the certificate completes the upgrade segment of the training programme required by rule 121.553 on the same aeroplane type if—

- (1) for pilots, the crew member is changing from one crew position to a more responsible crew position, and;
 - (2) for flight attendants, the flight attendant is upgrading to a role of increased responsibility.
- (b) The upgrade training must address the use of all safety and emergency equipment and procedures applicable to the new flight crew position for pilots, and the more responsible role for flight attendants on the aeroplane for which the upgrade is sought and must—
- (1) include training on human factors, and crew resource management, with particular emphasis on the changes brought about by the different flight crew position and new responsibilities; and
 - (2) include training in supervisory skills.

121.563 Crew member recurrent segment

- (a) A holder of an air operator certificate must ensure that a pilot or flight attendant of an aeroplane operating under the authority of the certificate completes the recurrent segment of the training programme required by rule 121.553 in order for the crew member to be current, and proficient on the aeroplane type, crew member position, and type of operation in which the crew member serves.
- (b) The holder of an air operator certificate must ensure that the recurrent segment includes flight training for flight crew members—
- (1) every 6 months for an air operation conducted under IFR; and
 - (2) every 12 months for an air operation conducted under VFR.
- (c) The holder of an air operator certificate must ensure that an air operator completes a recurrent segment of the training programme using the training equipment specified in rule 121.565.
- (d) The holder of an air operator certificate must ensure that the recurrent segment of the training programme addresses training on human factors and crew resource management.

121.565 Flight crew training equipment

(a) A holder of an air operator certificate must ensure that the crew member training programme required by rule 121.553 for flight crew members includes both ground and flight instruction using—

- (1) training devices; and
- (2) a flight simulator for the aeroplane type being used.

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

- (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 119.81.

(c) 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.

(d) When flight crew training is conducted using equipment or resources that are not used solely for training, the certificate holder must ensure that

sufficient access is available to the equipment or resource to enable the training to be completed—

- (1) without unplanned interruption; and
 - (2) in an environment that is conducive to the objective and safety outcome of the training task.
- (e) The certificate holder must ensure that for each aeroplane type operated under the authority of the certificate, a flight simulator for that aeroplane type is used for the flight crew training components of the training programme.
- (f) Despite paragraph (e), if a flight simulator 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.

121.567 Pilot line training

(a) A holder of an air operator certificate must ensure that a pilot, other than a cruise relief pilot, who under rule 121.557 completes the introduction segment, or under rule 121.559 completes the transition segment, or under rule 121.561 completes the upgrade segment of the training programme required by rule 121.553—

- (1) completes a competency assessment under Subpart J before commencing the pilot line training specified in paragraph (b); and
 - (2) completes the pilot line training specified in paragraph (b).
- (b) The pilot line training required by paragraph (a)(2) must comprise of—
- (1) following introduction training segment—
 - (i) for multi-engine turboprop powered aeroplanes – 20 hours including 10 take-offs and landings of which at least 6 take-offs and landings must be as pilot flying; and

- (ii) for turbojet and turbofan powered aeroplanes – 25 hours including 10 take-offs and landings of which at least 6 take-offs and landings must be as pilot flying; and
 - (iii) for all aeroplanes, including those referred to in paragraphs (i) and (ii) – 4 operating cycles of which at least 2 must be as pilot flying;
- (2) following the transition or upgrade training segment—
 - (i) for multi-engine, turboprop powered aeroplanes – 12 hours including 10 take-offs and landings of which at least 6 take-offs and landings must be as pilot flying; and
 - (ii) for turbojet and turbofan powered aeroplanes – 20 hours including 10 take-offs and landings for the pilot-in-command of which 6 take-offs and landings must be as pilot flying; or 10 hours including 10 take-offs and landings for second-in-command of which 6 take-offs and landings must be as pilot flying; and
 - (iii) for all aeroplanes, including those referred to in paragraphs (i) and (ii) – 4 operating cycles of which at least 2 must be as pilot flying.
- (c) The pilot line training specified in paragraph (b) must be—
 - (1) acquired in an aeroplane conducting an air operation; and
 - (2) conducted under the supervision of an instructor—
 - (i) who meets the requirements referred to in rule 121.519; or
 - (ii) who is approved by the Director to conduct specific training for the introduction of a new aeroplane type.
- (d) For the purpose of paragraph (c)(1), the pilot instructor required by paragraph (c)(2)—
 - (1) must act as pilot-in-command at all times; and

- (2) must occupy a pilot station when supervising a pilot undergoing line training for a second-in-command position; and
 - (3) must occupy a pilot station when supervising a pilot undergoing line training for a pilot-in-command position, until the pilot acquiring the experience has—
 - (i) made at least 2 take-offs and landings as pilot flying in the aeroplane type for which the pilot-in-command qualification is required; and
 - (ii) demonstrated to the pilot instructor the ability to perform the duties of a pilot-in-command for that aeroplane type; and
 - (4) may occupy the observer's seat if the requirements of paragraph (3) are met.
- (e) A holder of an air operator certificate must ensure that a cruise relief pilot, completes the introduction segment referred to in rule 121.557, or completes the transition segment referred to in rule 121.559 and—
- (1) completes a competency assessment under Subpart J before commencing the pilot line training specified in paragraph (b); and
 - (2) completes at least 6 operating sectors as a cruise relief pilot occupying either pilot station; and
 - (3) completes a route check under Subpart J following the pilot line training specified in paragraph (2).
- (f) The pilot line training required by paragraph (e)(2) for a cruise relief pilot must be conducted—
- (1) under the supervision of a pilot instructor who meets the requirements referred to in rule 121.519; and
 - (2) on air operations in the particular aeroplane type that the training relates to.

121.569 Pilot consolidation

(a) A holder of an air operator certificate must ensure that a pilot, other than a cruise relief pilot, who completes an introduction segment required by rule 121.557, a transition segment required by rule 121.559, or an upgrade segment required by rule 121.561 of the training programme required by rule 121.553—

- (1) completes the applicable pilot line training required by rule 121.567, and a route check under Subpart J for the transition and upgrade segments, before commencing the consolidation specified in paragraph (b); and
- (2) completes at least 100 hours of flight time experience or 75 operating cycles in the applicable crew position under paragraphs (b) and (c) for consolidation of a pilot's knowledge and skills; and
- (3) completes a route check under Subpart J following consolidation for an introduction segment.

(b) A pilot undergoing consolidation of knowledge and skills required by paragraph (a)—

- (1) must complete the 100 hours of flight time or 75 operating cycles within 120 days from the completion of the introduction or transition segment of the training; and
- (2) must operate exclusively during the consolidation period on the one aeroplane type that the training relates to; and
- (3) may count the flight time or operating cycles accumulated for the pilot line training required by rule 121.567 towards meeting the requirement under paragraph (a); and
- (4) if the pilot is undertaking the consolidation following the completion of an introduction segment of the training programme, the flight experience required by paragraph (a) must be conducted under the supervision of—
 - (i) a line supervisory pilot who meets the requirements referred to in rule 121.517; or

- (ii) a pilot instructor who meets the requirements referred to in rule 121.519; or
- (5) if the pilot is undertaking the consolidation following the completion of a transition or an upgrade segment of the training programme, the flight experience required by paragraph (a) must be conducted with—
- (i) a flight crew member who meets the requirements referred to in rule 121.531(a); or
 - (ii) a line supervisory pilot who meets the requirements referred to in rule 121.517; or
 - (iii) a pilot instructor who meets the requirements referred to in rule 121.519.
- (c) If the consolidation of the pilot's knowledge and skills cannot be completed within the 120 days as required by paragraph (b)(1), the period for completing the consolidation may be extended by up to 30 days if the pilot—
- (1) continues to meet all other requirements of the training programme; and
 - (2) satisfactorily completes a refresher course acceptable to the Director or a line operating flight supervised by—
 - (i) a line supervisory pilot who meets the requirements referred to in rule 121.517; or
 - (ii) a pilot instructor who meets the requirements referred to in rule 121.519; or
 - (iii) a flight examiner who meets the requirements referred to in rule 121.521.

121.571 Flight engineer consolidation

- (a) A holder of an air operator certificate must ensure that a flight engineer, who completes an introduction segment required by rule 121.557 or a transition segment required by rule 121.559 of the training programme required by rule 121.553, completes consolidation in accordance with the consolidation programme established by the certificate holder.

- (b) The consolidation programme required by paragraph (a) must—
- (1) specify a minimum number of flying hours or operating cycles to be completed exclusively on the particular aeroplane type; and
 - (2) specify a maximum period of time for completing the consolidation; and
 - (3) specify supervisory requirements during the period of consolidation; and
 - (4) include a competency assessment requirement at the completion of the consolidation.
- (c) The consolidation programme required by paragraph (a) must be acceptable to the Director and be included in the certificate holder's exposition.

121.573 Flight attendant training programme

A holder of an air operator certificate must ensure that the crew member training programme required by rule 121.553 for flight attendants addresses at least the following—

- (1) the authority structure of the aeroplane crew members:
- (2) training on human factors and crew resource management as may be applicable to the tasks assigned to the flight attendant position:
- (3) crew member assignments, functions, and responsibilities during emergency situations:
- (4) procedures for passenger handling, including emergency procedures and procedures to be followed in dealing with special classes of passengers according to the certificate holder's exposition:
- (5) the briefing of passengers:
- (6) the location and operation of emergency equipment available for use by flight attendants or other crew members:
- (7) the correct use of cabin equipment and controls:

- (8) the location and use of oxygen equipment:
- (9) the location and use of all normal and emergency exits, including evacuation slides and escape ropes:
- (10) cabin health and first aid in accordance with ICAO Doc 10002 Cabin Crew Safety Training Manual, Chapter 9:
- (11) the certificate holder's documentation and procedures:
- (12) applicable Civil Aviation Rules and supporting documentation.

121.575 Flight attendant operating experience

(a) A holder of an air operator certificate must ensure that a person is not designated to perform the functions of a flight attendant on an aeroplane being operated under the authority of the certificate unless that person—

- (1) has completed the applicable segment of the crew member training programme as required by rule 121.553; and
 - (2) immediately following the completion of an introduction segment required by rule 121.557 or a transition segment required by rule 121.559 of the training programme specified in rule 121.553—
 - (i) completes 5 hours line operating flight time experience, including at least 2 operating cycles, on the aeroplane type, and in the crew member position that the person is assigned to serve in; or
 - (ii) has appropriate flight attendant operating experience acceptable to the Director on another aeroplane type operating under this Part, and in the crew member position that the person is assigned to serve in.
- (b) The line operating flight time experience required by paragraph (a)(2)(i)—
- (1) must be accumulated under the supervision of a person who meets the requirements referred to in rule 121.525; and

- (2) may include not more than 2.5 hours flight time experience conducted in a full scale, type specific, cabin training device acceptable to the Director.

121.577 Crew members training records

A holder of an air operator certificate must maintain a record of all training and consolidation required by this Subpart that each of its crew members undertakes as specified in rule 119.67.

Subpart J — Crew Member Competency Requirements

121.601 Purpose

This Subpart prescribes the rules governing the competency assessment of flight crew members and flight attendants who are trained under Subpart I.

121.603 General

(a) A holder of an air operator certificate must establish a crew member competency assessment programme under this Subpart to ensure that each person who is assigned to perform the function of a crew member on an aeroplane operating under the authority of the certificate is competent to perform their assigned crew member function.

(b) The crew member competency programme must be—

- (1) acceptable to the Director; and
- (2) controlled by the certificate holder; and
- (3) specific to each aeroplane type or variant; and
- (4) completed in a flight simulator when completing flight crew competency assessments required by rules 121.607(2), (3) and (5).

(c) The certificate holder may—

- (1) implement the crew member competency assessment programme required by paragraph (a) under the authority of the certificate; or
- (2) contract with the holder of an aviation training organisation certificate issued under Part 141, to conduct the competency

assessments in accordance with the crew member competency assessment programme required by paragraph (a), if the aviation training organisation certificate authorises the holder to conduct the competency assessments; or

- (3) for a competency assessment conducted outside New Zealand, contract with an organisation that meets an equivalent standard specified in Part 141 to conduct the assessment in accordance with the applicable requirements specified in the crew member competency programme required by paragraph (a).
- (d) The certificate holder must ensure that the person responsible for the flight crew member competency assessment programme holds a flight examiner rating.
- (e) Despite paragraph (b)(4), if a flight simulator is not available for the aeroplane type, the certificate holder may apply to the Director to amend the competency assessment programme for the aeroplane type to conduct the competency assessment without the use of a flight simulator.
- (f) The certificate holder must ensure that a competency assessment referred to in paragraph (e) is completed in accordance with a safe flight practice guide that is acceptable to the Director.
- (g) The certificate holder must ensure that each flight simulator or training device used for the competency assessment referred to in paragraph (b)(4)—
- (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.

121.605 Competency assessment programme responsibilities

- (a) A holder of an air operator certificate must be ultimately responsible for the adequacy and implementation of the competency assessment programme required by rule 121.603.
- (b) The certificate holder must ensure that a crew member who is subject to a competency assessment is assessed in accordance with the programme.

121.607 Flight crew competency assessments

A holder of an air operator certificate must ensure that—

- (1) each pilot acting as pilot-in-command of an aeroplane conducting an air operation under the authority of the certificate has, within the immediately preceding 12 months, passed a route check conducted in an aeroplane including an aerodrome proficiency check that is administered by a flight examiner and that—
 - (i) consists of at least 1 flight over 1 route segment and 1 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 of an aeroplane performing an air operation appropriate to the type of air operations authorised by the certificate holder's operations specifications; and
- (2) each pilot acting as a flight crew member of an aeroplane conducting an air operation under VFR has, within the immediately preceding 12 months, successfully completed a competency assessment administered by a flight examiner that covers—
 - (i) procedures, including emergency procedures; or
 - (ii) the pilot's flying skills in an aeroplane type normally used by the pilot in an air operation; and
 - (iii) human factors and crew resource management; and

- (3) each pilot acting as a flight crew member of an aeroplane conducting an air operation under IFR has, within the immediately preceding 6 months, successfully completed a competency assessment administered by a flight examiner 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) includes human factors and crew resource management; and
- (4) each pilot acting as a flight crew member of an aeroplane conducting an air operation 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;
 - (ii) the certificate holder's operations specifications and exposition;
 - (iii) the aeroplane systems, performance, operating procedures, and the content of the flight manual for each aeroplane type normally flown by the pilot;
 - (iv) navigation, air traffic control, and meteorology;
 - (v) special flight operations as appropriate to the type of operation normally conducted by the pilot;
 - (vi) new equipment, procedures, and techniques;
 - (vii) location and operation of emergency equipment fitted to an aeroplane of the type normally flown by the pilot; and
- (5) each flight engineer acting as a flight crew member of an aeroplane conducting an air operation has, within the immediately preceding 12 months, completed a competency assessment administered by a flight engineer examiner that covers procedures, including emergency procedures, human factors, and

crew resource management 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

- (6) each flight engineer acting as a flight crew member of an aeroplane conducting an air operation 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;
 - (ii) the certificate holder's operations specifications and exposition;
 - (iii) the aeroplane systems, performance, operating procedures, and the content of the flight manual for each aeroplane type that the flight engineer is normally assigned to;
 - (iv) special flight operations that are appropriate to the type of operation that the flight engineer is normally assigned to;
 - (v) new equipment, procedures, and techniques.

121.609 Pilot instructor, Line supervisory pilot, Simulator instructor and Flight examiner competency assessments

A holder of an air operator certificate must ensure that the pilot instructor, line supervisory pilot, simulator instructor and flight examiner receive instruction and maintain proficiency as appropriate in—

- (1) the methods of imparting instruction on how to operate, and how to ensure the safe operation of a particular aeroplane type; and
- (2) the methods for evaluating and assessing flight crew competency in the technical and non-technical aspects of aircraft operation including human factors and crew resource management; and
- (3) the methods of recovery from mishandled, non-normal, and emergency manoeuvres; and
- (4) the operation of the aeroplane used or flight simulator approved by the Director, and its equipment, including operational flight,

procedures and manoeuvres under normal, non-normal, and emergency conditions.

121.611 Flight attendant competency assessments

A holder of an air operator certificate must ensure that each flight attendant acting as a crew member of an aeroplane conducting an air operation has, within the immediately preceding 12 months, successfully completed a competency assessment, including a flight assessment administered by a flight attendant assessor who meets the requirements referred to in rule 121.527, which includes at least the following areas appropriate to the person's assigned duties and responsibilities:

- (1) the authority of the pilot-in-command:
- (2) passenger handling, including procedures to be followed in handling persons whose conduct might jeopardise safety:
- (3) crew member assignments, functions, and responsibilities during emergencies, including evacuation of persons who may need assistance:
- (4) human factors and crew resource management:
- (5) the briefing of passengers:
- (6) the use of cabin equipment and controls:
- (7) the location and operation of items of emergency equipment:
- (8) the location and operation of oxygen equipment:
- (9) the location and operation of every normal and emergency exit, including evacuation chutes and escape ropes:
- (10) the seating of a person who may need assistance:
- (11) cabin health and first aid in accordance with ICAO Doc 10002 Cabin Crew Safety Training Manual, Chapter 9:
- (12) for a senior flight attendant and their deputy, ability to supervise a flight attendant carrying out their duties.

121.613 Competency and testing records

A holder of an air operator certificate must maintain an accurate record of all the competency assessments, route checks, and tests undertaken by each of its crew members in accordance with the procedures established under rule 119.67.

Subpart K – Fatigue of Flight Crew

121.801 Purpose

This Subpart prescribes flight time limitations and other rules to minimise fatigue in flight crew members of aeroplanes engaged in air operations.

121.803 Operator responsibilities

(a) The operator of an aeroplane must not cause or permit an air operation to be performed with an aeroplane unless—

- (1) a scheme has been established for the regulation of flight and duty times for every person flying as a flight crew member in the aeroplane; and
- (2) the scheme addresses the following factors where appropriate to the operator's type of operation:
 - (i) rest periods before flight:
 - (ii) acclimatisation:
 - (iii) time zones:
 - (iv) night operations:
 - (v) maximum number of sectors:
 - (vi) single pilot operations:
 - (vii) two pilot operations:
 - (viii) two pilots plus additional flight crew members:
 - (ix) flight crew members' qualifications:

- (x) mixed duties:
 - (xi) dead-head transportation:
 - (xii) reserve or standby period:
 - (xiii) flight duty period:
 - (xiv) in-flight relief:
 - (xv) type of operation:
 - (xvi) cumulative duty time:
 - (xvii) cumulative flight time:
 - (xviii) discretionary increase in flight time limitation or flight duty limitation or both:
 - (xix) circadian rhythm:
 - (xx) days off:
 - (xxi) record-keeping; and
- (3) the scheme is acceptable to the Director.
- (b) The operator of an aeroplane performing an air operation must not cause or permit a person to fly in the aeroplane as a flight crew member if the operator knows or has reason to believe that the person is suffering from, or, having regard to the circumstances of the flight to be undertaken, is likely to suffer from, such fatigue while they are so flying as may endanger the safety of the aeroplane or its occupants.
- (c) The operator of an aeroplane performing an air operation must—
- (1) keep an accurate record of the flight time and duty time of each flight crew member flying in the aeroplane; and
 - (2) retain the flight time and duty time record required by paragraph (c)(1) for a period of 12 months from the date on which it was made.

121.805 Flight Crew responsibilities

- (a) A person must not act as a flight crew member of an aircraft performing an air operation if the person knows or suspects that they are suffering from, or, having regard to the circumstances of the flight to be undertaken, are likely to suffer from, such fatigue as may endanger the safety of the aircraft or its occupants.
- (b) A flight crew member must not perform other hire or reward flight duties while employed, engaged, or contracted by an air operator when such flying in addition to that in an air operation exceeds the flight and duty time limitations prescribed in the scheme required by rule 121.803(a)(1) relating to the flight crew member.
- (c) A person must not act as a flight crew member of an aircraft performing an air operation unless the person has ensured that the limitations prescribed in the scheme required by rule 121.803(a)(1) relating to the person are not exceeded.
- (d) A person must not act as a flight crew member of an aircraft performing an air operation if, at the beginning of the flight, the aggregate of the person's previous and planned flight times on air operations—
- (1) during the period of 28 consecutive days expiring at the end of the day on which the flight begins — exceeds 100 hours; or
 - (2) during the period of 365 consecutive days expiring at the end of the day on which the flight begins — exceeds 1000 hours.

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) Each holder of an air operator certificate must 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.

- (b) The certificate holder must ensure that information provided for the compliance of its operations personnel, in place of the AIP, has been reproduced accurately and is current.
- (c) Each holder of an air operator certificate that elects to use non-State charts and similar in-flight documentation must ensure that this non-State material is identical in substance to the applicable State documentation.
- (d) Each person performing an air operation must 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 air operation:

- (1) details of the operational flight plan:
- (2) NOTAM and aeronautical information service briefing documentation appropriate to the operation:
- (3) meteorological information appropriate to the operation:
- (4) a copy of the load manifest:
- (5) notification of dangerous goods:
- (6) copies of the relevant aeronautical charts:
- (7) for a regular air transport service, a route guide covering each route flown and alternate aerodromes that may be used.

(b) The certificate holder 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) Each holder of an air operator certificate must, 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 must be of a permanent nature.

121.859 Retention period

- (a) Each holder of an air operator certificate must ensure that the following information is retained for 12 months from the date it was completed:
- (1) operational records:
 - (2) load manifest:
 - (3) notification of dangerous goods.
- (b) The certificate holder must ensure that its flight crew records of flight and duty time is retained for 12 months from the date of entry of the record.
- (c) The certificate holder must ensure that its records of training, checking, and qualifications of any crew member is retained until 12 months after the individual has left the certificate holder's employment.

Subpart M — Advance 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 must establish an advanced qualification programme under this Subpart, or a training programme in accordance with Subpart I.
- (b) The certificate holder must, 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 must ensure that the programme is conducted safely and without unacceptable risk to the equipment and personnel, or third parties.
- (d) The certificate holder must ensure that the person responsible for its programme holds a flight examiner rating.
- (e) The certificate holder must ensure that its programme is controlled by the certificate holder.
- (f) The certificate holder must ensure that each person to whom this Subpart applies complies with all requirements of the programme.
- (g) The certificate holder must 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 must ensure that, when categories not referred to in paragraph (g), such as flight attendants and other operations personnel, are included within an advanced qualification programme, all positions of that category are covered by the programme.

121.905 Programme revisions

- (a) Each holder of an air operator certificate that establishes or revises an advanced qualification curriculum, must 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 must ensure that the programme contains curricula—

- (1) required by this Subpart; and
- (2) that are acceptable to the Director.

(b) The certificate holder must 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 must ensure that its advanced qualification programme has separate curricula for indoctrination, for qualification, and for continuing qualification.

(b) The indoctrination curriculum must 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 necessary for the position the person will occupy.

(c) The qualification curriculum must 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 to perform assigned duties to the required standard.

(d) The continuing qualification curriculum must 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 must 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, or duties 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 personnel who 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 must ensure that each continuing qualification curriculum is based on a qualification cycle that ensures that—
- (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 rule 61.37.
- (b) The certificate holder must 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 must 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 must 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 must 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 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 evaluation period does not exceed a maximum of 26 calendar months.

Evaluation period training session

(f) The certificate holder must ensure that each evaluation period required by paragraph (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 date for completion of an evaluation period can be considered by the certificate holder to be completed in the last calendar month.

(h) The certificate holder must 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 in flight 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 in flight 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 of the 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 must ensure that each evaluation period includes a proficiency evaluation conducted during each training session that each person participating in this part of the programme must successfully complete.
- (j) The certificate holder must 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 must 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 the certificate 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 must 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 must 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 person serves; 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 is deemed to be completed on the due date.

(o) The certificate holder must ensure each pilot-in-command and second-in-command, and, if the certificate holder elects, flight engineer, meets the recent experience requirements prescribed in rule 61.37 or 63.157 as appropriate.

121.917 Crew resource management requirements

(a) Each holder of an air operator certificate must 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 must be conducted in a flight training device or flight simulator.

121.919 Data collection requirements

Each holder of an air operator certificate must 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
- (3) the applicant shows competence in exercises that test both the required technical knowledge and skills, and crew resource management knowledge and skills, together; and

- (4) 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) must 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 — EDTO Authorisation and Requirements

121.951 General

(a) Except as provided in rule 121.165(d), a holder of an air operator certificate must not operate an aeroplane on an EDTO unless—

- (1) the certificate holder is authorised under this Subpart to conduct an EDTO; and
- (2) the certificate holder's operations specifications required by rule 119.15—
 - (i) permits the intended EDTO; and
 - (ii) authorises the use of the airframe and engine combination for the EDTO; and
- (3) procedures for meeting the requirements of this Subpart for EDTO are detailed in the certificate holder's exposition required by rule 119.81.

(b) The Director may, on application in writing for an EDTO by a holder of an air operator certificate, authorise air operations beyond the time limits of the most time-limited system for an aeroplane as specified in the flight manual if satisfied on the evidence of a safety risk assessment provided by the operator covering the following:

- (1) the capabilities of the operator in conducting EDTOs; and
- (2) the overall reliability of the aeroplane to be operated under the EDTO; and
- (3) the reliability of each time-limited system of the aeroplane to be operated under the EDTO; and
- (4) information from the aeroplane manufacturer relevant to an EDTO; and
- (5) any specific mitigation measures to be taken by the certificate holder.

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 to be operated under the EDTO authorisation:
- (2) details, and evidence of the type design approval and the operating limitation of 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 more than 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 121.407:
- (8) details of the training programme required under Subpart I and applicable to the 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 D.5(a)(2) of Appendix D 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:
 - (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:
- (14) details of the point of no return for the aeroplane (if known).

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 119.15 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 is 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 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 119.15 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 minute 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 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 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 12 consecutive 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 119.15 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 119.15 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 119.15(d)(3); and
- (2) at least 1 suitable instrument approach procedure, published in the AIP of the State 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 listed in 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 listed in 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:

- (i) a change in the meteorological aerodrome forecast for the aerodrome that indicates that the weather conditions at the time of expected use will be below the landing minima for the aerodrome:
- (ii) 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 under 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 121.75, 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 91.423, 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 91.423 and the oxygen requirements of rule 91.209; 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; or
 - (iv) EDTO critical fuel for the aeroplane;
- (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 aeroplane's fuel consumption; or
 - (ii) if a performance deterioration allowance monitoring programme is not used for the aeroplane's 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 item for any applicable phases of flight.

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 <i>(Note: A single runway with reciprocal precision approach)</i>	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.

<i>procedures does not meet this requirement)</i>		
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 91.417.

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's operations specifications.

Appendix A — *Reserved*

Appendix B - Instruments and Equipment Airworthiness Design Standards

Instruments and equipment required by Subpart F must meet the following specifications and requirements:

B.1 Protective breathing equipment

- (a) Protective breathing equipment must—
- (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 aeroplane radios; and
 - (6) supply 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.

B.2 Emergency medical kit

Emergency medical kits must—

- (1) be located and secured such that—
 - (i) the possibility of damage or loss as the result of an accident is minimised; and
 - (ii) there is no danger to the occupants of the aeroplane; and
- (2) have their 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 Misuse of Drugs Regulations 1977; 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.

B.3 Public address system

- (a) A public address system must—
- (1) except for handsets, headsets, microphones, selector switches, and signalling devices, be capable of operation independent of the crew member intercom system required by rule 121.369(2); 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 flight attendant seat, have a microphone which is readily accessible to the seated flight attendant; and

- (4) be capable of operation within 10 seconds by a flight attendant 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, flight attendant seats, and work stations.
- (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 flight attendants.

B.4 Crew member intercom system

A crew-member intercom system must—

- (1) except for handsets, headsets, microphones, selector switches, and signalling devices, be capable of operation independent of the public address system required by rule 121.369(1); 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 flight-attendant station in each passenger compartment; and
- (6) be capable of operation within 10 seconds by a flight attendant at each of those stations in each passenger compartment from which its use is accessible; and
- (7) be accessible for use at enough flight attendant 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 call or an emergency call; and
- (9) provide a means of two-way communication between ground personnel and any two 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.

B.5 Cockpit voice recorder

A cockpit voice recorder must —

- (1) meet the requirements of the TSO C123 series; and
- (2) be fitted with an underwater locating device that meets the requirements of the TSO C121 series; and
- (3) record and stores at least the last 2 hours of its operation; and
- (4) have an alternate power source that is separate from the power source that normally provides power to the recorder and complies with standard 6.3.2.4.1 of ICAO Annex 6.

B.6 Flight data recorder

A flight data recorder must —

- (1) meet the requirements of the TSO C124 series; and
- (2) be fitted with an underwater locating device that meets the requirements of the TSO C121 series; and
- (3) be of a non-ejectable type and capable of recording and storing at least the last 25 hours of its operation in a digital form; and
- (4) record the parameters as detailed in—
 - (i) Figure 1; and

- (ii) as applicable, Table 1 and Table 2—
of Appendix B.

B.7 Additional attitude indicator

The third presentation of attitude must 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.

B.8 Weather radar

Weather radar must meet the requirements of the TSO C63 series.

B.9 Ground proximity warning system

GPWS must meet the requirements of the TSO C92 series.

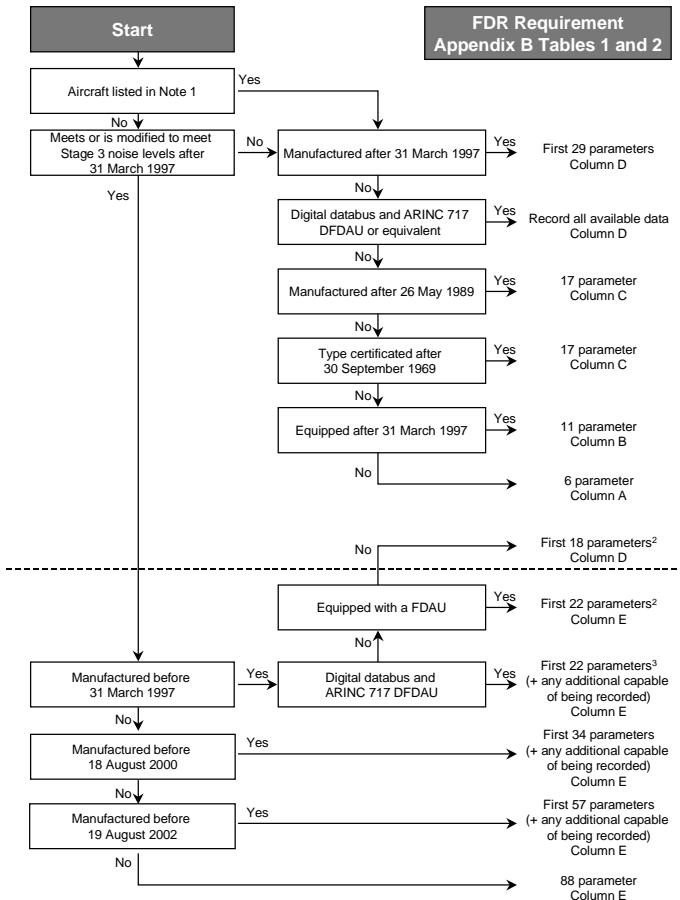
B.10 Terrain awareness and warning system (TAWS)

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 C151a or TSO C151b for Class B equipment.

B.11 Airborne Collision Avoidance System (ACAS II)

ACAS II must meet the requirements of TSO C119b



Notes

1. *General Dynamics Convair 580, 600, 640, deHavilland 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.*

Figure 1. Flight Data Recorder Decision Chart

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 rule 121.373.

Parameters * if installed	(A)	(B)	(C)	(D)	(E)
	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 or Calibrated airspeed
4	Vertical acceleration	Vertical acceleration	Vertical acceleration	Heading	Heading (primary flight crew 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

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 rule 121.373.

Parameters * if installed	(A)	(B)	(C)	(D)	(E)
	6 Parameter	11 Parameter	17 Parameter	44 Parameter	88 Parameter
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-wire systems)
					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- wire systems)
14			Thrust of each engine	Marker beacon passage	Yaw control(s) position (non fly- by-wire systems)
					Yaw control(s) position (fly-by- wire systems)
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

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 rule 121.373.

Parameters * If installed	(A)	(B)	(C)	(D)	(E)
	6 Parameter	11 Parameter	17 Parameter	44 Parameter	88 Parameter
18				Lateral acceleration	Lateral acceleration
19				Pitch trim position	Pitch trim surface position
20				Glideslope 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 for propeller aeroplane
23				Radio altitude	Ground spoiler position or speed brake position
24				Master warning	Outside air temperature or total air temperature
25				Main gear squat switch status	Autopilot/ autothrottle/AFC S mode and engagement status
26 *				Angle of attack	Radio altitude
27				Outside air temperature OR	Localiser deviation or

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 rule 121.373.

Parameters * if installed	(A)	(B)	(C)	(D)	(E)
	6 Parameter	11 Parameter	17 Parameter	44 Parameter	88 Parameter
				total air temperature	MLS azimuth
28				Hydraulics, each system, low pressure	Glideslope deviation or MLS elevation
29				Groundspeed	Marker beacon passage
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

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 rule 121.373.

Parameters * if installed	(A)	(B)	(C)	(D)	(E)
	6 Parameter	11 Parameter	17 Parameter	44 Parameter	88 Parameter
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 detection
42				Landing gear or gear selector position	Throttle/power lever position
43				DME 1 and 2 distance	Additional engine parameters
44				Nav 1 and 2 frequency selection	TCAS
45					DME 1 and 2 distances
46					Nav 1 and 2 selected frequency
47 *					Selected barometric setting
48 *					Selected altitude
49 *					Selected speed

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 rule 121.373.

Parameters * if installed	(A)	(B)	(C)	(D)	(E)
	6 Parameter	11 Parameter	17 Parameter	44 Parameter	88 Parameter
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 format
57 *					Thrust command
58 *					Thrust target
59 *					Fuel quantity in CG trim tank
60					Primary navigation system reference
61 *					Ice detection
62 *					Engine warning each engine - vibration

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 rule 121.373.

Parameters * if installed	(A)	(B)	(C)	(D)	(E)
	6 Parameter	11 Parameter	17 Parameter	44 Parameter	88 Parameter
63 *					Engine warning each engine - over temp
64 *					Engine warning each engine - oil pressure low
65 *					Engine warning each engine - over speed
66					Yaw trim surface position
67					Roll trim surface position
68					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

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 rule 121.373.

Parameters * If installed	(A)	(B)	(C)	(D)	(E)
	6 Parameter	11 Parameter	17 Parameter	44 Parameter	88 Parameter
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

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 rule 121.373.

Parameters * if installed	(A)	(B)	(C)	(D)	(E)
	6 Parameter	11 Parameter	17 Parameter	44 Parameter	88 Parameter
					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 rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
Time or Relative time counts	24 hours 0 to 4095	±0.125% per hour	4	1s	UTC time preferred when available. Counter increments each four seconds of system operation
Pressure Altitude	-1000' to maximum certified altitude -1000' to maximum certified altitude +5000'	±100' to ±700' (refer TSO C124a, C51a)	1	5' to 35'	Data should be obtained from the air data computer when 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 (primary flight crew reference)	0 - 360° 0 - 360° and discrete 'true' or 'mag'	±2°	1	0.5°	When true or magnetic heading can be selected as the primary heading reference, a discrete indicating selection must be recorded

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
Normal acceleration (vertical)	-3g to +6g	±1% maximum range excluding datum error of ±5%	0.125	0.004g	
Pitch attitude	±75°	±2°	1 or 0.25 for aeroplanes manufactured after 2002	0.5°	A sampling rate of 0.25 is recommended
Roll attitude	±180°	±2°	1 or 0.5 for aeroplanes manufactured after 2002	0.5°	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

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
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 overspeed conditions
Autopilot engagement	Discrete - 'on' or 'off'		1		
Longitudinal acceleration	±1g	±1.5% maximum range excluding datum error of ±5%	0.25	0.004 g	

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
Pitch control(s) position (non fly-by-wire systems) ¹	Full range	$\pm 2^\circ$	1 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	$\pm 2^\circ$	1 0.5 or 0.25 for aeroplanes manufactured after 2002	0.275% of full range	

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
Lateral control(s) position (non fly-by-wire systems) ¹	Full range	$\pm 2^\circ$	1 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	$\pm 2^\circ$	1 0.5 or 0.25 for aeroplanes manufactured after 2002	0.22% of full range	

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
Yaw control(s) position (non fly-by-wire systems) ¹	Full range	$\pm 2^\circ$	1 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	$\pm 2^\circ$	1 0.5	0.2% of full range	

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
Pitch control surface(s) position ¹	Full range	$\pm 2^\circ$	1 0.5 or 0.25 for aeroplanes manufactured after 2002	0.2% 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) position ¹	Full range	$\pm 2^\circ$	1 0.5 or 0.25 for aeroplanes manufactured after 2002	0.3% 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 or 0.25

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
Yaw control surface(s) position ¹	Full range	$\pm 2^\circ$	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	$\pm 1g$	$\pm 1.5\%$ maximum range excluding datum error of $\pm 5\%$	0.25	0.004g	Twin engine aircraft only
Pitch trim surface position	Full range	$\pm 3\%$	1	0.6% of full range	

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
Trailing edge flap or cockpit control position	Full range or discrete each position	$\pm 3^\circ$ or pilot's indicator	2	0.5% of full range	Flap position and cockpit control may each be sampled alternately at four second intervals, to give a data point every two seconds
Leading edge flap or cockpit control position	Full range or discrete each position	$\pm 3^\circ$ 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		Turbojet - two discretises enable the three states to be determined Turboprop - one discrete
Ground spoiler position or speed brake position	Full range or discrete each position	$\pm 2^\circ$	1 or 0.5 for aeroplanes manufactured after 2002	0.5% of full range	

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
Outside air temperature or total air temperature	-50°C to +90°C	±2° C	2	0.3° C	
Autopilot/autothrottle/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 +2 500'	±2' or ±3% whichever is the greater below 500' and ±5% above 500'	1	1' + 5% above 500'	For autoland/ category III operations, each radio altimeter should be recorded, but arranged so that at least one is recorded each second.

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
Localiser deviation, MLS azimuth, or GNSS latitude deviation.	±400 microamps or available sensor range as installed ±62°	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, MLS elevation, or GNSS vertical deviation.	±400 microamps or available sensor range as installed +0.9° to +30°	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 rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
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 (0.25 recommended)		
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	

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
GPWS	Discrete - 'warning' or 'off'		1		A suitable combination of discretes 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 discretes should be recorded
Drift angle	As installed	As installed	4	0.1°	
Wind speed and direction	As installed	As installed	4	1kt and 1°	
Latitude and longitude	As installed	As installed	4	0.002°	Provided by the Primary Navigation System Reference. Where capacity permits latitude/longitude resolution should be 0.0002°
Stick shaker and pusher activation	Discrete - 'on' or 'off'		1		A suitable combination of discretes to determine activation

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
Windshear detection	Discrete - 'warning' or 'off'		1		
Throttle/power lever position	As installed	As installed	1 per lever		For aeroplanes with non-mechanically linked cockpit engine controls
	Full range	±2%		2% of full range	
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 rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
TCAS	Discretes	As installed	1		A suitable combination of discretes 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 frequency	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 flight path	Full range	±5%	1	1°	

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
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 - 'GNSS', 'INS', 'VOR/DME', 'MLS', 'Loran C', 'Omega',		4		A suitable combination of discretes to determine the Primary Navigation

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
	'Localiser Glideslope'				System reference
Ice detection	Discrete - 'ice' or 'no ice'		4		
Engine warning each engine - vibration	Discrete		1		
Engine warning each engine - over temp	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°	

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
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		
Para-visual display	Discrete - 'on' or 'off'		1		

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
Cockpit trim control input position - pitch	Full range	±5%	1	0.2% of full range	Where mechanical means for control inputs are not available, cockpit display trim positions should be recorded.
Cockpit trim control input position - roll	Full range	±5%	1	0.7% of full range	Where mechanical means for control inputs are not available, cockpit display trim positions should be recorded.
Cockpit trim control input position - yaw	Full range	±5%	1	0.3% of full range	Where mechanical means for control inputs are not available, cockpit display trim positions should be recorded.
Trailing edge flap and cockpit flap control position	Full range or discrete each position	±5%	2	0.5% of full range	Trailing edge flaps and cockpit flap control position may each be sampled alternately at

Table 2. Part 121 - Flight Data Recorder Parameter Specifications.

This table refers to the FDR requirements of rule 121.373.

Parameters	Range	Sensor input accuracy	Seconds per sampling interval	Resolution	Remarks
					four second intervals to provide a sample each 0.5 second
Leading edge flap and cockpit flap control position	Full range or discrete each position	±5%	1	0.5% of full range	
Ground spoiler position and speed brake selection	Full range or discrete each position	±5%	0.5	0.3% of full range	
All cockpit flight control input forces - control wheel, control column, rudder pedal	Full range – control wheel- ±70lbs, control column ±85lbs, rudder pedals, ±165lbs.	±5%	1	0.3% of full range	For fly-by-wire flight control systems, where flight control surface position is a function of the displacement of the control input device only, it is not necessary to record this parameter

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 regimes only the surface position OR the control position need be sensed. For aeroplanes with non-mechanical control systems (fly-by-wire) both surface and control position must be recorded.

Appendix C — Runways

This Appendix is referred to in 121.71.

C.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 wing span and outer main gear wheel span.

C.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 aeroplane's aerodrome reference field length; and
- (c) **Thirdly:** Determine the code letter of element 2 corresponding to the dimensions of the aeroplane's wing and outer main gear span. The code letter for element 2 is the code letter which corresponds to the wing span, or the outer main gear span, whichever gives the most demanding code letter. For instance, if code letter C corresponds to the aeroplane's wing span and code letter D corresponds to the aeroplane's outer main gear span, 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	Wing Span	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
		F	65m up to but not including 80 m	14 m up to but not including 16 m

C.1.2 Determining the minimum runway width using Table 2

Having determined the aeroplane's ARC, the 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 runway width is 30 m.

Table 2. Runway widths

Code Number	Code Letter					
	A	B	C	D	E	F
1	18 m	18 m	23 m	-	-	-
2	23 m	23 m	30 m	-	-	-
3	30 m	30 m	30 m	45 m	-	-
4	-	-	45 m	45 m	45 m	60 m

Appendix D — Landing Distance Assessments for Runways

D.1 Permitted landing distance assessments – Dry runway

The following procedure must be carried out by a holder of an air operator certificate under rule 121.221(b)(2) for calculating the landing distance where a runway is dry:

(a) A holder of an air operator certificate must ensure that, for each aeroplane it operates, the landing weight for the estimated time of landing 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 for a turbojet or turbofan powered aeroplane; and
- (2) 70% of the landing distance available for a propeller-powered aeroplane.

(b) When calculating the landing weight under paragraph (a), the certificate holder must 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.

(c) The certificate holder must, for an aeroplane to land as specified in paragraphs (a) and (b), 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.
- (d) If the certificate holder is unable to comply with paragraph (c) 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).

D.2 Permitted landing distance assessments – Wet or contaminated runway

A holder of an air operator certificate must carry out the following procedure under rule 121.221(b)(2) for calculating the landing distance where a runway is wet or contaminated:

- (a) 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 of them, 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 paragraph D.1; and
 - (2) when the appropriate weather reports or forecasts or a combination of them, indicate that the runway at the estimated time of arrival may be contaminated, the landing distance available is at least—
 - (i) 115% of the landing distance required by paragraph D.1; or
 - (ii) the landing distance determined in accordance with contaminated-landing-distance data.
- (b) A landing distance on a wet runway shorter than that required by paragraph (a), but not less than that required by paragraph D.1, may be used if performance data allows a shorter landing distance on wet runways.