Civil Aviation Order 20.2

as amended

made under subregulation 244 (2) of the

Civil Aviation Regulations 1988

This compilation was prepared on 15 May 2006
taking into account amendments up to *Civil Aviation Order 20.2 Amendment Order (No. 1) 2006*

Prepared by the Legislative Drafting Branch, Legal Services Group,
Civil Aviation Safety Authority, Canberra

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2 Removal of locking and safety devices

2.2 Where external control surface locks, undercarriage pins and locks, or other external locking or restricting devices have been fitted, they must, except where otherwise approved by CASA, be removed prior to commencement of taxiing for the purpose of taking off. They must be removed only by the pilot in command or the co-pilot, or by a person instructed in this function and authorised to perform it by the owner, hirer, operator or pilot in command.

2.3 Where external control surface locks, undercarriage pins and locks, or other external locking or restricting devices are removed by a person other than the pilot in command or co-pilot:

2.3.1 Removal must only be effected as directed by the pilot in command.

2.3.2 The locks, pins and other external devices must be exhibited to the pilot in command or co-pilot from a position which will enable him or her to readily determine that all pins, locks and devices are being displayed.

2.3.3 During the hours of darkness the owner, hirer, operator or pilot in command must ensure that adequate lighting is provided to enable the pilot in command or co-pilot (as the case may be) to see the articles displayed.

2.3.4 When the pilot in command or co-pilot is satisfied that all locking devices have been removed and displayed he or she must give an agreed form of acknowledgement to the person effecting removal.

2.3A If any external control surface lock, undercarriage pin or lock, or other external locking or restricting device, fitted to an aircraft:

(a) has been removed by a person other than the pilot in command of the aircraft; and

(b) has not been exhibited to him or her under subparagraph 2.3.2;

the pilot in command of the aircraft must not start taxiing the aircraft, or allow the aircraft to be taxied, for the purposes of taking-off unless the co-pilot has told him or her that the lock, pin or other device has been removed:

(c) by the co-pilot; or

(d) by a person other than the co-pilot in accordance with paragraph 2.3.

2.4 When an aircraft has been parked, taxied or towed in winds exceeding 35 knots and the control systems and surfaces have not been effectively restrained either by a person in the cockpit or by approved control surface gust locks, the pilot in command or an appropriately licensed maintenance engineer must, before flight, inspect the control systems and control surface attachments for damage.

2.5 Where external control surface locks or restricting devices have been removed as prescribed by paragraphs 2.2 and 2.3 of this section, or where an aircraft is to be flown for the first time following maintenance work involving the aircraft's control surfaces or control surface systems, the pilot in command must, immediately before taxiing for the purpose of taking off, test the flight

controls to the full limit of their travel and make such other tests as are necessary to ensure that those controls are functioning correctly.

Note Paragraph 244 (1) (a) of the *Civil Aviation Regulations 1988* requires that immediately before taking-off on any flight, the pilot in command of an aircraft must test the flight controls on the ground to the full limit of their travel and make such other tests as are necessary to ensure that those controls are functioning correctly.

3 Security of doors and hatches

Immediately before taxiing for the purpose of taking off on any flight, the pilot in command must ensure that all doors, escape hatches and loading hatches are properly secured.

4 Precautions before solo flight in aircraft fitted with dual controls

The pilot in command of an aircraft fitted with dual controls, which is to be flown solo, must ensure that safety harness and any other articles or equipment which may foul the controls are safely secured; if the second control column is readily detachable, it must be removed.

5 Fuel system inspection

5.1 The operator and pilot in command must ensure that the following inspections and tests for the presence of water in the fuel system of the aircraft are made:

(a) either:

(i) if:

(A) the aircraft manufacturer's data specifies the manner in which inspections and tests for the presence of water in the aircraft's fuel system are to be made; and

(B) the data has been approved under regulation 42M of the *Civil Aviation Regulations 1988* as part of the aircraft's system of maintenance;

an inspection and test in accordance with the approved data; or

(ii) in any other case — before the start of each day's flying, and after each refuelling, with the aircraft standing on a reasonably level surface, drain a small quantity of fuel from each fuel tank into a clear transparent container and check by an approved method for the presence of water;

(b) on such aircraft types which may be specified by CASA, extend the foregoing inspection to fuel system filters and collector boxes. It is recommended that all aircraft fuel system filters and collector boxes be checked for water contamination at frequent intervals.

Note It is important that checks for water contamination of fuel drainage samples be positive in nature and do not rely solely on sensory perceptions of colour and smell, both of which can be highly deceptive. The following methods are acceptable:

1. Place a small quantity of fuel into the container before taking samples from tank or filter drain points. The presence of water will then be revealed by a visible surface of demarcation between the two fluids in the container.
2. Check the drainage samples by chemical means such as water detecting paper or paste, where a change in colour of the detecting medium will give clear indication of the presence of water.

3. In the case of turbine fuel samples, tests should also include inspection for persistent cloudiness or other evidence of the presence of suspended water droplets, which will not necessarily be detected by methods mentioned in notes 1 and 2. Should any doubt exist of the suitability of the fuel, the checks specified in the aircraft Operators Maintenance Manual should be followed. It is advisable to allow turbine fuel a reasonable period of stagnation before drawing test samples from fuel drain points; this allows settling of suspended water which is a slower process in turbine fuel than in aviation gasoline.

5.1A In relation to a refuelling that is a hot refuelling in accordance with section 20.10 or section 20.10.1, the operator and pilot in command of an aircraft are not required to carry out inspections and tests in accordance with paragraph 5.1. This does not effect the requirement to do so before the start of each day's flying.

5.2 If, at any time, a significant quantity of water is found to be present in an aircraft fuel system, the operator and pilot in command must ensure that all traces of it are removed from the fuel system, including the fuel filters, before further flight.

Note In eliminating water from an aircraft fuel system, it is important that consideration be given to the possibility of water lying in portions of the tanks or fuel lines where, because of the design of the system or the existing attitude of the aircraft, it is not immediately accessible to a drain point.

5.3 The operator and pilot in command must ensure that, before the commencement of each day's flying, all external fuel tank vents are inspected for freedom from obstruction.

6 Fuel quantity measurement

6.1 The operator of an aircraft having a maximum take-off weight of more than 5 700 kg and engaged in commercial operations must ensure that the operations manual contains instructions and procedures for the pilot in command of the aircraft to verify the quantity of fuel on board the aircraft before flight.

Note See Airworthiness Bulletin 28-002 for advice on instructions and procedures that may be adopted to verify the quantity of fuel on board an aircraft before flight.

Notes to Civil Aviation Order 20.2

Note 1

The Civil Aviation Order (in force under the *Civil Aviation Regulations 1988*) as shown in this compilation comprises Civil Aviation Order 20.2 amended as indicated in the Tables below.

Table of Orders

Year and number	Date of notification in *Gazette*/ registration on FRLI	Date of commencement	Application, saving or transitional provisions
CAO 2004 No. R1	8 December 2004	8 December 2004 (*see* s. 2)	
CAO 20.2 2006 No. 1	FRLI 15 May 2006	16 May 2006 (*see* s. 2)	

Table of Amendments

ad. = added or inserted am. = amended rep. = repealed rs. = repealed and substituted

Provision affected	How affected
s. 20.2	rs. CAO 2004 No. R1
subs. 6	am. CAO 20.2 2006 No. 1

Civil Aviation Amendment Order (No. R3) 2004

I, WILLIAM BRUCE BYRON, Director of Aviation Safety, on behalf of CASA, issue the following Civil Aviation Order under subregulation 207 (2) of the *Civil Aviation Regulations 1988*.

[Signed Bruce Byron]

Bruce Byron
Director of Aviation Safety and
Chief Executive Officer

2 December 2004

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1 Name of Order

This Order is the Civil Aviation Amendment Order (No. R3) 2004.

2 Commencement

This Order commences on gazettal.

3 Replacement of section 20.4 of the Civil Aviation Orders

Section 20.4 of the Civil Aviation Orders is omitted and a new section substituted as set out in Schedule 1.

Schedule 1 Substitution of section 20.4 of the Civil Aviation Orders

SECTION 20.4

PROVISION AND USE OF OXYGEN AND PROTECTIVE BREATHING EQUIPMENT

1 APPLICATION

1.1 This section applies to all Australian aircraft.

2 INTERPRETATION

2.1 In this section:

cabin attendant means a crew member, other than a flight crew member, who is qualified in the execution of emergency procedures in accordance with section 20.11 of the Civil Aviation Orders.

cabin pressure altitude, in relation to aircraft with pressurised cabins, means the pressure altitude corresponding to the pressure in the cabin of the aircraft.

emergency descent safety period, in relation to an aircraft, means the period determined by doubling the time specified by its manufacturer as the time required for the aircraft to descend from its maximum operating altitude to 10 000 feet.

first aid oxygen means oxygen provided for emergency medical care from an aircraft storage system.

high-capacity aircraft means an aircraft with a passenger seating capacity exceeding 38 passenger seats or a payload capacity exceeding 4 200 kgs.

maximum operating altitude, in relation to an aircraft, means the highest altitude, according to its manufacturer, at which the aircraft may be operated.

protective breathing equipment means equipment used to protect crew members from the effects of smoke and toxic fumes and gases, being equipment that complies with the requirements of:

(a) section 108.26 of the Civil Aviation Orders; or
(b) TSO C116.

2.2 Where, in calculating the number of passengers for the purposes of subparagraphs 6.4 (a) and (b), 7.5 (a) and (b), 8.8 (a) and paragraph 9.1,

the number calculated is, or includes, a fraction of a whole number, that fraction is to be disregarded and the number is to be taken to be, or is to be increased by, 1, as the case requires.

2.3 Where this section requires an amount of supplemental oxygen to be provided to flight crew members on flight deck duty, then for the purposes of determining that amount, the amount of oxygen provided at flight crew member duty stations for protective breathing purposes may be taken into account in determining that first-mentioned amount.

3 EQUIPMENT STANDARDS

3.1 Oxygen must be stored, and dispensing and control equipment must be installed, on an aircraft in accordance with section 108.26 of the Civil Aviation Orders.

3.2 The minimum rates of oxygen flow on an aircraft must be in accordance with the minimum rates specified in accordance with section 108.26 of the Civil Aviation Orders.

4 DUTIES OF CREW MEMBERS IN RELATION TO OXYGEN AND PROTECTIVE BREATHING EQUIPMENT

4.1 Where the provision of oxygen equipment or protective breathing equipment is required under this section in relation to the flight of an aircraft, a flight crew member must, before take-off of that aircraft, check that:

(a) the member's station oxygen equipment and protective breathing equipment is serviceable; and
(b) the communication systems associated with that equipment are serviceable; and
(c) the oxygen supply available is sufficient for the flight; and
(d) the member's oxygen mask is connected to the appropriate supply terminal; and
(e) where the oxygen mask is adjustable — the mask fits correctly.

4.2 Where the provision of protective breathing equipment for cabin attendants is required under this section in relation to the flight of an aircraft, a crew member nominated by the operator of the flight must, before take-off of that flight, check that the equipment is on board the aircraft and is serviceable.

4.3 Where a check has been conducted in accordance with paragraph 4.2 in respect of an aircraft and that aircraft has landed at any place, it is not necessary to conduct another such check before the aircraft takes-off from that place if a cabin attendant remains on board the aircraft while the aircraft is on the ground.

4.4 Where an aircraft is to operate above Flight Level 250 a crew member must, before that Flight Level is reached, by means of oral instructions and, where necessary, practical demonstrations, inform the passengers on the aircraft of:

(a) the location of, and manner of operating, the oxygen dispensing equipment; and

(b) the necessity of using oxygen in the event of cabin depressurisation.

4.5 Where an aircraft is to operate above a cabin pressure altitude of Flight Level 140 a crew member must, before take-off of that aircraft, by means of oral instructions and, where necessary, practical demonstrations, inform the passengers on the aircraft of:

(a) the location of, and manner of operating, the oxygen dispensing equipment; and

(b) when it is necessary to use the oxygen dispensing equipment.

5 INFORMATION TO BE INCLUDED IN OPERATIONS MANUAL AND FLIGHT MANUAL

5.1 An operator must include in the operations manual required under regulation 215 of the *Civil Aviation Regulations 1988* to be provided by the operator, information relating to the following matters:

(a) the procedures to be followed in the operation of the oxygen systems in the aircraft to which the operations manual relates;

(b) the methods of administering oxygen to passengers;

(c) the methods of determining, by observation of the equipment, that oxygen is being supplied to dispensing units;

(d) the variation of the duration of the oxygen supply with varying cabin pressure altitude and numbers of passengers;

(e) the conditions of operation under which crew members must use oxygen;

(f) the procedures for demonstrating the donning and use of oxygen masks by passengers in accordance with paragraphs 4.4 and 4.5;

(g) schematic diagrams of the oxygen systems installed in the aircraft to which the operations manual relates.

5.2 Where a flight manual for an aircraft does not contain information and instructions relating to the matters referred to in subparagraphs 5.1 (a) and (c), the owner or operator, as the case may be, of the aircraft must alter the flight manual to include such information and instructions.

6 SUPPLEMENTAL OXYGEN REQUIREMENTS FOR UNPRESSURISED AIRCRAFT

Supplemental oxygen for flight crew members

6.1 A flight crew member who is on flight deck duty in an unpressurised aircraft must be provided with, and continuously use, supplemental oxygen at all times during which the aircraft flies above 10 000 feet altitude.

6.2 A flight crew member must, in respect of any period during which the member is not on flight deck duty, be provided with the amount of supplemental oxygen that is provided to a crew member in accordance with paragraph 6.3.

Supplemental oxygen for other crew members

6.3 A crew member (not being a flight crew member on flight deck duty) in an unpressurised aircraft must be provided with supplemental oxygen:

(a) in respect of any period exceeding 30 minutes during which the aircraft flies between 10 000 feet altitude and Flight Level 120 (both inclusive); and

(b) at all times during which the aircraft flies above Flight Level 120;

and must use supplemental oxygen at all times during which the aircraft flies above Flight Level 140.

Supplemental oxygen for passengers

6.4 Where an unpressurised aircraft carrying passengers flies for more than 30 minutes above 10 000 feet altitude and up to and including Flight Level 140, the aircraft must carry sufficient supplemental oxygen to supply:

(a) 10% of the passengers with oxygen for 30 minutes; or

(b) 20% of the passengers with oxygen for 15 minutes.

6.5 Where an unpressurised aircraft carrying passengers flies above Flight Level 140, the aircraft must carry sufficient supplemental oxygen to supply each passenger with oxygen during all periods that the aircraft flies above Flight Level 140.

7 SUPPLEMENTAL OXYGEN REQUIREMENTS FOR PRESSURISED AIRCRAFT ENGAGED IN FLIGHTS NOT ABOVE FLIGHT LEVEL 250

Application

7.1 This subsection applies to pressurised aircraft that do not fly above Flight Level 250.

Manner of calculating supplemental oxygen supply

7.2 In determining the amount of oxygen required to be carried on a pressurised aircraft for the purposes of paragraphs 7.3, 7.4 and 7.5, an operator is to determine that amount on the basis that:

(a) a cabin pressurisation failure will occur at a point on the planned route which is most critical from the standpoint of oxygen need; and

(b) after the failure, the aircraft will descend in accordance with the emergency procedures specified in the aircraft's flight manual (without exceeding its normal operating limitations) to a flight altitude or a Flight Level, as the case may be, that will allow the safe termination of the flight.

Supplemental oxygen for flight crew members

7.3 A flight crew member who is on flight deck duty in a pressurised aircraft to which this subsection applies must:

(a) be provided with at least a 15 minute supply of supplemental oxygen whenever the aircraft is to be operated above 10 000 feet flight altitude; and

(b) use supplemental oxygen at all times during which the cabin altitude exceeds 10 000 feet.

Supplemental oxygen for other crew members

7.4 A crew member (not being a flight crew member on flight deck duty) in a pressurised aircraft to which this subsection applies must:

(a) be provided with supplemental oxygen at all times during which the cabin altitude exceeds 10 000 feet; and

(b) use supplemental oxygen at all times during which the cabin pressure altitude exceeds Flight Level 140.

Supplemental oxygen for passengers

7.5 A pressurised aircraft to which this subsection applies that is to be operated above 10 000 feet flight altitude must carry sufficient supplemental oxygen:

(a) where the aircraft can safely descend to Flight Level 140 or a lower level within 4 minutes at all points along the planned route and maintain Flight Level 140 or a lower level for the remainder of the flight — to provide 10% of the passengers with supplemental

oxygen for 30 minutes or 20% of the passengers with supplemental oxygen for 15 minutes; and

(b) where the aircraft cannot safely descend to, or maintain, Flight Level 140 or a lower level in accordance with subparagraph (a) — to provide each passenger with supplemental oxygen for so much of the flight time above Flight Level 140 that exceeds 4 minutes duration and to provide 10% of the passengers with supplemental oxygen for 30 minutes or 20% of the passengers with supplemental oxygen for 15 minutes.

8 SUPPLEMENTAL OXYGEN REQUIREMENTS FOR PRESSURISED AIRCRAFT ENGAGED IN FLIGHTS ABOVE FLIGHT LEVEL 250

Application

8.1 This subsection applies to pressurised aircraft that fly above Flight Level 250.

Manner of calculating supplemental oxygen supply

8.2 In determining the amount of oxygen required to be carried on a pressurised aircraft for the purposes of paragraphs 8.3, 8.6, and 8.8, an operator is to determine that amount on the basis that:

(a) a cabin pressurisation failure will occur at a point on the planned flight route which is most critical from the standpoint of oxygen need; and

(b) after the failure, the aircraft will descend in accordance with the emergency procedures specified in the aircraft's flight manual (without exceeding its normal operating limitations) to a flight altitude or a Flight Level, as the case may be, that will allow the safe termination of the flight.

Supplemental oxygen for flight crew members

8.3 A flight crew member who is on flight deck duty in a pressurised aircraft to which this subsection applies:

(a) must be provided with, and must use, supplemental oxygen at all times during which the cabin altitude exceeds 10 000 feet; and

(b) must be provided with at least:

(i) in the case of a high capacity aircraft that is to be operated above Flight Level 250 but not above Flight Level 450 — a 45 minute supply of oxygen; or

(ii) in the case of a high capacity aircraft that is to be operated above Flight Level 450 — a supply of oxygen for the period determined by adding 30 minutes to the aircraft's emergency descent safety period; or

(iii) in the case of an aircraft, other than a high capacity aircraft, that is to be operated above Flight Level 250 but not above

Flight Level 450 — the supply of oxygen set out in paragraph 8.3.1; or

(iv) in the case of an aircraft, other than a high capacity aircraft, that is to be operated above Flight Level 450 — a supply of oxygen for the aircraft's emergency descent safety period.

8.3.1 For the purposes of sub-subparagraph 8.3 (b) (iii), the supply of oxygen that must be provided in an aircraft is:

(a) if the aircraft's flight manual sets out the time specified by its manufacturer as the time required for it to descend from its maximum operating altitude to 10, 000 feet:

(i) a supply for the aircraft's emergency descent safety period; or

(ii) a 10 minute supply;

whichever is more; or

(b) in any other case — a 15 minute supply.

8.4 Unless paragraph 8.5 applies, where a pressurised aircraft to which this subsection applies is operated above Flight Level 250, then at least 1 pilot seated at the controls of the aircraft must use supplemental oxygen at all times during which the aircraft is operated above Flight Level 250.

8.5 Paragraph 8.4 does not apply if an aircraft is equipped with a quick-donning type oxygen mask for the pilot or, if more than 1 pilot is required for the flight, each pilot. However, whenever the aircraft is operating above flight level 450, the pilot, or one of the pilots, seated at the controls of the aircraft must wear an oxygen mask that is properly fitted and supplying oxygen.

Supplemental oxygen for other crew members

8.6 A crew member (not being a flight crew member on flight deck duty) in a pressurised aircraft to which this subsection applies must:

(a) be provided with supplemental oxygen at all times during which the cabin altitude exceeds 10 000 feet; and

(b) use supplemental oxygen at all times during which the cabin pressure altitude exceeds Flight Level 140.

Use of portable oxygen equipment by cabin attendants

8.7 During flight in a pressurised aircraft above Flight Level 250, each cabin attendant must carry portable oxygen equipment containing at least a 15 minute oxygen supply, unless CASA is satisfied that sufficient portable oxygen units with masks, or spare oxygen outlets and masks, are distributed throughout the cabin so as to ensure the immediate availability of oxygen to each cabin attendant regardless of the attendant's location in the cabin.

Supplemental oxygen for passengers

8.8 A pressurised aircraft that is to be operated above Flight Level 250 must carry an amount of supplemental oxygen that is sufficient:

(a) to provide:

(i) 10% of the passengers with oxygen during all periods when the cabin altitude is above 10 000 feet and up to and including Flight Level 140; and

(ii) each passenger with oxygen during all periods when the cabin pressure altitude exceeds Flight Level 140; or

(b) to provide each passenger with a 10 minute supply of oxygen;

whichever amount is the greater.

9 FIRST AID OXYGEN

9.1 Where:

(a) a pressurised aircraft operates above Flight Level 250; and

(b) a flight crew of more than 1 pilot is, under the aircraft's flight manual, required to fly the aircraft;

then the aircraft must carry sufficient first aid oxygen to supply 1% of the passengers with such oxygen for the entire planned duration of the flight.

10 PROTECTIVE BREATHING EQUIPMENT

Protective breathing equipment for flight crew members

10.1 A pressurised aircraft that, under the aircraft's flight manual, requires a flight crew of more than 1 pilot to fly the aircraft, must be equipped with:

(a) protective breathing equipment at each flight crew member duty station, being equipment that is capable of providing a 15 minute supply of protective oxygen for each flight crew member in accordance with subsection 7 of section 108.26 of the Civil Aviation Orders; and

(b) a portable protective breathing equipment unit on, or immediately adjacent to, the flight deck, being a unit that complies with subsection 7 of section 108.26 of the Civil Aviation Orders or with TSO C116.

10.2 In the case of an aircraft that is engaged in cargo only operations, the portable protective breathing equipment unit referred to in subparagraph 10.1 (b) must comply with subsection 7 of section 108.26 of the Civil Aviation Orders.

Protective breathing equipment for cabin attendants

10.3 On and after 1 January 1991, a pressurised aircraft engaged in passenger transport services must, as part of its equipment, be equipped

with not less than the prescribed number of protective breathing equipment units for use by cabin attendants, being units that comply with TSO C116.

10.4 The prescribed number of units that, for the purposes of paragraph 10.3, must be carried on an aircraft is the number equal to:

(a) the number of hand-held fire extinguishers required to be carried on the aircraft under section 105 of the Civil Aviation Orders; or

(b) the number of cabin attendants that, under section 20.16.3 of the Civil Aviation Orders, must be carried as crew members;

whichever is the less.

10.5 The units referred to in paragraph 10.3:

(a) where it is practicable to do so — must be located adjacent to the hand held fire extinguishers carried on board the aircraft; and

(b) where it is not practicable to do so — must be located so that they are readily accessible to cabin attendants during flight; and

(c) must be installed in accordance with the equipment installation requirements specified in the certification standards that apply to the aircraft.

10.6 The unit required to be carried on an aircraft under subparagraph 10.1 (b) may be included in the number determined under paragraph 10.4.

Civil Aviation Amendment Order (No. R8) 2004

I, WILLIAM BRUCE BYRON, Director of Aviation Safety, on behalf of CASA, issue the following Civil Aviation Order under subregulation 235 (2) of the *Civil Aviation Regulations 1988*.

[Signed Bruce Byron]

Bruce Byron
Director of Aviation Safety and
Chief Executive Officer

2 December 2004

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1 Name of Order

This Order is the Civil Aviation Amendment Order (No. R8) 2004.

2 Commencement

This Order commences on gazettal.

3 Replacement of section 20.7.2 of the Civil Aviation Orders

Section 20.7.2 of the Civil Aviation Orders is omitted and a new section substituted as set out in Schedule 1.

Schedule 1 Substitution of section 20.7.2 of the Civil Aviation Orders

SECTION 20.7.2

AEROPLANE WEIGHT AND PERFORMANCE LIMITATIONS — AEROPLANES NOT ABOVE 5700 KG — REGULAR PUBLIC TRANSPORT OPERATIONS

1 APPLICATION

Unless CASA otherwise directs, this section applies to all multi-engine aeroplanes having a maximum take-off weight not in excess of 5 700kg engaged in regular public transport operations.

2 DEFINITIONS

In this section, terms and abbreviations have the meanings defined in section 20.7.1B, and in Part 101 except that:

take-off distance available means the length of take-off run available plus, where clearway is provided, a maximum of 60 metres of clearway.

3 TAKE-OFF PERFORMANCE LIMITATIONS

3.1 No aeroplane shall take off at a weight in excess of the take-off weight specified in the aeroplane flight manual for the take-off distance available. In determining this weight, account shall be taken of the aerodrome pressure altitude, ambient temperature, runway surface and slope, and the wind velocity at the time of take-off.

3.2 No aeroplane shall take off at a weight such that, allowing for normal consumption of fuel in flight to the destination and alternate aerodromes, the weight on arrival would exceed the weight specified in the aeroplane flight manual with respect to baulked landing climb performance. In determining this weight, account shall be taken of the aerodrome pressure altitude and, for aeroplanes having a maximum take-off weight exceeding 3 500 kg the ambient temperature forecast for the estimated time of landing.

3.3 No aeroplane shall take off at a weight such that, allowing for normal consumption of fuel in flight to the destination and alternate aerodromes, the weight on arrival would require a landing distance, in accordance with the aeroplane flight manual, greater than the landing distance available:

(a) on the most favourable runway under zero wind conditions, unless that runway would be unusable due to an excessive crosswind forecast for the estimated time of landing then;

(b) on the most suitable available runway, using wind components derived from the minimum wind velocity which would make the runway in (a) above unusable due to cross wind limitations;

provided that if the weight derived from (b) above is greater than the weight derived from (a), the weight derived from (a) shall be the limiting weight. In determining these weights, account shall be taken of the aerodrome pressure altitude and forecast temperature for the time of landing.

4 TAKE-OFF OBSTACLE CLEARANCE LIMITATIONS

4.1 No aeroplane shall take off at a weight which exceeds any weight limitation in the aeroplane flight manual with respect to take-off climb with all engines operating. In determining this weight, account shall be taken of the aerodrome pressure altitude and the ambient temperature.

4.1.1 Additionally, no aeroplane having a maximum take-off weight exceeding 3 500 kg shall take off at a weight such that the take-off climb gradient with the critical engine inoperative is less than the obstacle-free gradient specified for the take-off distance available. Where the obstacle-free gradient specified for the take-off distance available is less than 1.9%, the take-off weight shall be determined on the basis of a 1.9% gradient. The gradient shall be established for a distance of 3 000 metres from the end of the take-off distance available. In determining this weight, account shall be taken of the aerodrome pressure altitude and ambient temperature.

5 EN-ROUTE LIMITATIONS

5.1 No aeroplane shall take off at a weight in excess of that which, in accordance with approved one engine inoperative en-route performance data permits the aeroplane to comply with the requirements of paragraphs 5.2 or 5.3 under the prevailing meteorological conditions.

5.2 An aeroplane shall be capable of climbing to, and maintaining, a flight altitude which provides at least 1 000 feet vertical clearance from all terrain and obstructions along the route within:

(a) 5 nautical miles on either side of track, for V.F.R. procedures flights; and

(b) such greater distances as required by the accuracy of the navigation aids used for I.F.R. procedures flights.

Note: Lowest Safe Altitudes (LSALT) published in the Aeronautical Information Publication satisfy the terrain and obstacle clearance requirements for I.F.R. procedure flights.

5.3 If compliance with paragraph 5.2 is not possible a "drift down" procedure may be planned such that with one engine inoperative:

(a) a return to the aerodrome of departure is possible clear of all terrain and obstructions if one engine fails before the aeroplane reaches the planned cruising altitude; and

(b) after reaching the planned cruising altitude, the resultant flight path will be such as to permit the aeroplane to continue flight to an aerodrome where a landing can be made and will provide at least 2000 feet vertical clearance from all terrain and obstructions within the distance specified in paragraph 5.2.

5.4 Conditions

In determining take-off weight required by paragraph 5.1 of this section:

(a) engine failure shall be assumed to occur at the most critical point along the route; and

(b) forecast atmospheric pressures and temperatures shall be used; and

(c) the effect of forecast wind velocities shall be applied to the flight path; and

(d) in meteorological conditions where the use of aeroplane icing protection systems is likely to be required, the effect of their use on the flight path shall be taken into account; and

(e) fuel jettisoning shall be permitted in accordance with the aeroplane flight manual procedures, to the extent consistent with reaching the intended aerodrome of landing with the required fuel reserves; and

(f) the aerodrome where the aeroplane is assumed to land after engine failure shall be specified in the flight plan and shall meet the requirements for an alternate aerodrome; and

(g) consumption of fuel after engine failure shall be calculated to meet the consumptions required in following the planned flight path.

6 LANDING LIMITATIONS

Except in an emergency, an aeroplane shall not land at an aerodrome unless the landing distance available on the runway of intended landing is equal to, or greater than, the landing distance required in the aeroplane flight manual for the landing weight of the aeroplane. In deriving the landing distance required, account shall be taken of the aerodrome pressure altitude and ambient temperature, the runway slope and surface, and the wind velocity existing at the time of landing.

7 UNSERVICEABLE EQUIPMENT

7.1 When any item of equipment, which will invalidate any performance assumption on which the aeroplane flight manual data is established, is a permissible unserviceability, then the operations manual shall contain information to permit such adjustments to take-off weights, landing weights or distances required, as are necessary to maintain the intended level of safety of operations.

7.2 The information required by paragraph 7.1 shall be subject to approval by CASA before being used in operations.

8 COMPLIANCE

8.1 Procedures to show compliance with this section shall be determined by the operator to the satisfaction of CASA and shall be included in the operations manual.

8.2 A pilot in command shall be considered to have complied with this section if the aeroplane he commands is operated in accordance with the relevant procedures and at the weights permitted by an operations manual provided in pursuance of the *Civil Aviation Regulations 1988* for the particular operation.

Note: Documents which are required to be carried in an aircraft, such as the flight manual for the aircraft, may form part of an operations manual.

Australian Government

Civil Aviation Safety Authority

Civil Aviation Order 20.9 (as amended)

made under subregulation 235 (7) of the *Civil Aviation Regulations 1988*.

This compilation was prepared on 11 November 2011 taking into account amendments up to *Civil Aviation Order 20.9 Amendment Instrument 2011 (No. 2).*

Prepared by the Legislative Drafting Branch, Legal Services Division, Civil Aviation Safety Authority, Canberra.

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Section 20.9 (Air service operations — precautions in refuelling, engine and ground radar operations)

Section 20.9

Air service operations — precautions in refuelling, engine and ground radar operations

2 Application

2.1 Subject to paragraph 2.2, this section applies to:

(a) all Australian aircraft operating on aerodromes in Australian territory; and

(b) as far as practicable — all Australian aircraft operating outside Australian territory.

2.2 This section does not apply to an aircraft that is being refuelled in accordance with:

(a) section 20.10, except as set out in subparagraph 1A.1 (a) of section 20.10; and

(b) section 20.10.1, except as set out in subparagraph 2.2 (a) of section 20.10.1.

3 Fuel and oils

3.1 The pilot in command of an aircraft shall ensure that the aircraft is not flown unless the aviation fuel, aircraft engine lubricating oil, aircraft engine power augmentation fluid and aircraft hydraulic system fluid used in connection with the servicing or operation of the aircraft complies with the specification and grade required or approved for the purpose by CASA.

Note 1 In respect of aircraft engine power augmentation fluid and aircraft hydraulic system fluid the specification and grade specified for a particular purpose in a manual or manuals promulgated by the aircraft or aircraft engine manufacturer may be considered as having been approved by CASA.

Note 2 The pilot in command may assume that:

(a) aviation fuel; and

(b) aircraft engine lubricating oil; and

(c) aircraft engine power augmentation fluid; and

(d) aircraft hydraulic system fluid in the aircraft, other than that which he has caused to be delivered into the aircraft, complies with the required specification and grade.

3.3 All ground fuel stock shall be carefully checked for the presence of undissolved water before the fuelling operation is commenced.

Note 1 This precaution is particularly important when handling fuel from drum stocks.

Note 2 Attention is drawn to the necessity of using a positive method, such as suitable water-detecting paste or paper, in testing for the presence of free water since sensory perceptions of colour and smell, if used alone, can be quite misleading.

Note 3 In the case of turbine fuels, attention is also drawn to the necessity of watching for signs of cloudiness or other indication of the presence of suspended water droplets which will not necessarily be detected by the means mentioned in Note 2.

3.4 All fuel shall be strained or filtered for the removal of free or suspended water and other contaminating matter before entering the aircraft tanks.

Note Attention is drawn to the special standards of filtration which may be specified by the manufacturers of certain types of engines. e.g. turbine engines and direct-injection piston engines.

4 Fuelling of aircraft

4.1 Location of aircraft

4.1.1 During fuelling operations, the aircraft and ground fuelling equipment shall be so located that no fuel tank filling points or vent outlets lie:

(a) within 5 metres (17 ft) of any sealed building; and

(b) within 6 metres (20 ft) of other stationary aircraft; and

(c) within 15 metres (50 ft) of any exposed public area; and

(d) within 15 metres (50 ft) of any unsealed building in the case of aircraft with a maximum take-off weight in excess of 5 700 kg (12 566 lb) and

(e) within 9 metres (30 ft) of any unsealed building in the case of aircraft with a maximum take-off weight not exceeding 5 700 kg (12 566 lb).

4.1.1.1 Notwithstanding the contents of paragraph 4.1.1 limited fuelling operations for maintenance purposes may be carried out in certain hangars under the following conditions:

(a) refuelling or defuelling of gasoline or wide-cut gasoline type turbine fuel is not permitted;

(b) overwing fuelling is not permitted;

(c) these operations shall not be permitted in hangars occupied by 2 or more tenants;

(d) the operator shall obtain approval from CASA for the detailed procedures under which these operations may be performed. These procedures shall be described in the maintenance manual and shall include the circumstances under which refuelling or defuelling in hangars or maintenance area is permitted, and the maximum volume of fuel involved.

4.1.1.2 For the purpose of this Order, a sealed building is one which all the external part within 15 metres (50 ft) of an aircraft's fuel tank filling points or vent outlets or ground fuelling equipment is of non-flammable materials and has no openings or all openings are closed.

4.1.2 Where the fuelling equipment is not mobile, the aircraft shall be so placed that it can be rapidly moved to a place of safety, and a means of ensuring that this can be done shall be readily available.

Note The following operations are not deemed to constitute fuelling operations:

(a) the drainage of a small quantity of fuel from a fuel system drain point;

(b) the transfer of fuel from tank to tank within an aircraft making use exclusively of lines and equipment permanently installed in the aircraft.

4.2 Fuelling with passengers on board

4.2.1 The operator of an aircraft must ensure that avgas is not loaded onto an aircraft while passengers are on board, or entering or leaving, the aircraft.

4.2.2 The operator of an aircraft that has an underwing fuelling system must ensure that fuel is not loaded onto the aircraft using this system while passengers are on board, or entering or leaving, the aircraft unless the fuel is aviation grade turbine fuel that contains anti-static additive or is loaded in the USA and meets the ASTM D 1655 standard and the following conditions are satisfied:

(a) before the fuel is loaded, all persons who may be on board, or entering or leaving, the aircraft while the fuel is loaded are told that:

(i) fuel is to be loaded; and

(ii) their seat-belts must not be fastened while the fuel is loaded; and

(iii) they must not smoke, use any electrical equipment (other than medical equipment used for treating a patient, the operation of which will not affect the safety of any person on board the aircraft) or do anything else that might cause fuel vapours to ignite during the loading;

(b) all persons on board, or entering or leaving, the aircraft obey the instructions given under sub-subparagraphs (a) (ii) and (iii);

(c) a cabin crew or flight crew member is appointed to perform the following tasks while the fuel is loaded:

(i) ensure the safety of the passengers;

(ii) maintain discipline inside the aircraft;

(iii) supervise any necessary evacuation of the aircraft;

(d) while the fuel is loaded:

(i) the aircraft's "fasten seat belt" signs are turned off; and

(ii) the aircraft's "no smoking" signs are turned on; and

(iii) the aircraft's emergency lights (if any) are armed;

(e) while the fuel is loaded, there is at least 1 cabin crew or flight crew member on duty in the aircraft:

(i) for every 72 passengers on board the aircraft; or

(ii) for every passenger zone in the aircraft in which there are passengers;

whichever is more;

(f) while the fuel is loaded, there is at least 1 cabin crew or flight crew member on duty by at least 1 exit door of each of the aircraft's passenger zones in which there are passengers;

(g) all cabin crew or flight crew members who are on duty in the aircraft while the fuel is loaded:

(i) are prepared for an immediate evacuation; and

(ii) supervise the passengers during the loading; and

(iii) ensure that the aisles and exits are unobstructed during the loading;

(h) the areas outside the aircraft that would be used if the aircraft were evacuated are kept clear while the fuel is loaded;

(k) if the aircraft's engine is running — a member of the aircraft's flight crew is on duty on its flight deck;

(l) the operator's operations manual sets out:

(i) the responsibilities of members of the operating crew who are on duty in the aircraft while fuel is loaded; and

(ii) procedures for complying with the requirements of this paragraph.

Note An underwing fuelling system is any system that forms part of the aircraft and that allows delivery of fuel to the aircraft without exposing the fuel to the atmosphere during delivery.

4.2.3 Subject to paragraph 4.2.4, the operator of an aircraft without an underwing fuelling system must ensure that fuel is not loaded on to the aircraft while passengers are on board, or entering or leaving, the aircraft.

4.2.4 The operator of an aircraft that cannot be underwing fuelled may allow fuel to be loaded onto the aircraft while a passenger is on board if:

(a) the passenger's medical condition is such that he or she cannot leave the aircraft without assistance; and

(b) the aircraft's cabin door is open; and

(c) the equipment used for loading or unloading passengers (if any) is in position at the door; and

(d) the requirements and conditions set out in paragraph 4.2.2 are satisfied.

4.2.5 If:

(a) fuel is being loaded onto an aircraft in accordance with paragraph 4.2.2 or 4.2.4; and

(b) either:

(i) fuel vapour is found inside the aircraft; or

(ii) for any other reason it is not safe to continue loading the fuel;

the aircraft's operator must ensure that the loading of the fuel stops immediately.

4.3 Aircraft safety precautions during fuelling operations

4.3.1 All engines in the aircraft, including any auxiliary power units, must be shut down, except where CASA is satisfied that the operation of such an engine or auxiliary power unit will not present a hazard and where a statement to that effect, together with any special conditions for operation, is included in the operator's operations manual if such a manual is required.

Note For this paragraph, CASA is satisfied if the aircraft flight manual permits operation of such an engine or auxiliary power unit.

4.3.2 When an external electrical supply is used, the connections between that supply and the aircraft electrical system shall be made and securely locked before the fuelling operation is connected and shall not be disconnected until the operation has been completed, except that connectors, which provide control to ensure effective engagement before external power can be supplied to the aircraft, need not be locked.

4.3.3 A person shall not, and the pilot in command and the operator shall take reasonable steps to ensure that a person does not, during fuelling operations:

(a) operate or perform maintenance work on the aircraft's radar equipment except that where the fuel is kerosene, operation or maintenance may be carried out provided the radar transmitter is de-activated; or

(b) except where the fuel involved is kerosene, carry out maintenance on any electrical, electronic or radio systems within the aircraft or operate such equipment other than the aircraft's interior lighting or electrical apparatus necessary for the fuelling process.

4.3.4 For fuelling an aircraft, the following requirements apply:

(a) before a fuel tank cap is removed, the aircraft and all fuelling equipment must be bonded;

(b) if bonding is lost, fuel transfer must be stopped immediately and not resumed until the bond is restored.

Note Care must be taken before reconnecting the bonding wire to allow for dissipation of static electricity that may have built up.

4.3.4A For paragraph 4.3.4:

bonded means the aircraft and the fuelling equipment have the same electrical potential.

fuelling includes refuelling and defuelling.

fuelling equipment includes mobile fuel tankers, in-ground refuel ports, fuel bowsers, hand pumps, drums, funnels and other loose items of equipment if these are used in the fuelling operation.

4.3.5 All footwear worn by aircraft servicing personnel and persons operating fuelling equipment shall be of a non-sparking type and such persons shall not carry any matches, cigarette lighters or other objects which could represent an ignition hazard.

4.3.6 Except where automatic shut-off devices limit the capacity of an aircraft fuel tank, the operator and the pilot in command shall ensure that sufficient airspace remains in each fuel tank to allow for anticipated fuel expansion.

4.3.7 When a fuelling operation on an aircraft has been completed, the pilot in command and the operator of the aircraft shall ensure that all fuel and oil tank caps are securely refitted.

4.3.8 Aircraft oil tanks shall not be drained or filled when the aircraft is inside a hangar or other building unless the oiling equipment used complies with the provisions of Appendix I to this Order.

4.4 Safety precautions external to an aircraft during fuelling operations

4.4.1 The area in which fuelling operations are carried out shall be clearly placarded as a 'No Smoking' area and the limits of this area shall be a sealed building or at least 15 metres (50 ft) from the aircraft or ground fuelling equipment.

4.4.2 Where mobile fuelling equipment is used, the equipment shall be so placed that it can be rapidly moved in the event of fire.

4.4.3 A person shall not, and the pilot in command and the operator shall take reasonable steps to ensure that a person does not, during fuelling operations:

(a) smoke or use a naked flame within 15 metres (50 ft) of the aircraft and ground fuelling equipment; or

(b) except in the case of aircraft, operate an internal combustion engine or any electrical switch, battery, generator, motor or other electrical apparatus within 15 metres (50 ft) of the aircraft's fuel tank filling points or vent outlets, and ground fuelling equipment unless the engine, switch, generator, motor or apparatus complies with the provisions of Appendix I to this Order and has been inspected.

4.4.4 At least 2 fire extinguishers of approved type and capacity must be positioned:

(a) within 15 metres, but not less than 6 metres, from the aircraft and the fuelling equipment; or

(b) carried on the fuelling equipment.

4.4.5 If the fire extinguishers are carried on the fuelling equipment, they must:

(a) be fitted with quick release brackets; and

(b) be readily available from either side of the equipment; and

(c) be located as far as practicable from the vehicle fuel tanks and fuelling points.

4.4.6 For paragraph 4.4.4 and 4.4.5, the fire extinguishers may be:

(a) 60B dry powder fire extinguishers; or

(b) an 80B dry powder fire extinguisher and a 20B foam extinguisher; or

(c) other fire extinguishers approved by CASA.

Note The use of 2 carbon dioxide extinguishers, each with a minimum capacity of 4.5 kg (10 lb), is acceptable for this purpose. Extinguishers of other types and capacities may be approved on application to CASA.

4.5 Action in the event of a fire hazard

4.5.1 A fuelling operation shall be suspended and the Airport Fire Service notified when any fuel of a quantity likely to create a fire hazard is spilled on or within 15 metres (50 feet) of the aircraft or ground fuelling equipment, including the bilge of a fuelling barge, and the operation shall not recommence until the fire hazard is removed.

4.5.2 A fuelling operation shall be stopped as soon as it becomes apparent that an infringement exists of any of the relevant requirements of this Order.

4.5.3 When any fuel of a quantity likely to create a fire hazard is spilled on or within 15 metres (50 ft) of the aircraft or ground fuelling equipment, the pilot in command or, in his absence, the operator shall ensure that:

(a) passengers remaining on board or in the process of embarking or disembarking are removed to a point at least 15 metres (50 ft) from the spilled fuel; and

(b) mobile power units, vehicles and power operated loading devices operating within 15 metres (50 ft) of the spilled fuel are shut down; and

(c) maintenance work of any nature on or within the aircraft is suspended and not recommenced until the spilled fuel has been removed.

4.7 In this subsection:

cabin crew member means a person who:

(a) is a member of the operating crew, but not the flight crew, of an aircraft; and

(b) may be assigned to emergency duties in the aircraft under subsection 12 of section 20.11 of the Civil Aviation Orders.

passenger zone in relation to an aircraft, means an area within the aircraft which has:

(a) seats for 72 or less passengers; and

(b) an exit.

5 Starting and ground operations of engines

5.1 The pilot in command or in his absence any other person responsible for starting or ground operation of an aircraft shall ensure that:

5.1.1 In the case of land aircraft, passenger loading equipment to permit rapid evacuation of passengers and crew is kept immediately available during the starting of engines.

5.1.2 In the case of seaplanes, water transport of a capacity sufficient to enable rapid evacuation of passengers and crew is immediately available during the starting of engines.

5.1.3 Where any fuel or other flammable material is spilled within 15 metres (50 ft) of an aircraft, the aircraft engines shall not be started or operated until the fire hazard has been removed.

5.1.4 An aircraft engine shall not be started or operated:

(a) within 5 metres (17 ft) of any sealed building; or

(b) within 8 metres (25 ft) of other aircraft; or

(c) within 15 metres (50 ft) of any exposed public area; or

(d) within 15 metres (50 ft) of any unsealed building in the case of an aircraft with a maximum take-off weight exceeding 5 700 kg (12 566 lb); or

(e) within 8 metres (25 ft) of any unsealed building in the case of an aircraft with a maximum take-off weight not exceeding 5 700 kg (12 566 lb);

and turbine engines, in addition, shall not be operated within the appropriate distance specified below of any other aircraft, fuelling equipment or exposed public areas which lie to the rear of and within a 15 degree arc either side of the exhaust outlet axis of that engine:

Engine type	**Power condition**	**Minimum distance metres**
Turbo-prop	At or below normal slow taxiing power	15 (50 ft)
	At power used to initiate movement of a stationary aircraft	23 (75 ft)
Turbo-jet	At or below normal slow taxiing thrust	30 (100 ft)
	At thrust used to initiate movement of a stationary aircraft	46 (150 ft)

Note Fuelling equipment does not include equipment and outlet points of an installation located below ground level when the equipment is stowed and covering hatches are in place.

5.2 The operator of an aircraft shall ensure that all persons who may be required to start the engine of the aircraft are familiar with the method of operation of any installed engine nacelle fire extinguishing equipment.

5.3 The pilot in command and the operator shall ensure that passengers do not embark or disembark or that freight is not loaded or unloaded from the aircraft whilst an engine of the aircraft is operating unless the passengers and/or the loading personnel have been given instruction and guidance to protect them from injury as a consequence of engine operation.

6 Ground operation of aircraft radar equipment

6.1 The requirement of this subsection shall apply to all radar equipment with a nominal peak power output rating in excess of 25 kW.

6.2 During all ground operation, including testing and maintenance of aircraft radar equipment, the operator and person in charge of such equipment shall ensure that:

6.2.1 The equipment is not energised in its normal mode (antenna rotating) unless the sector area scanned by the radar beam is clear of the following objects to a distance of 37 metres (120 ft) from the antenna:

(a) aircraft being refuelled or defuelled;

(b) fuel tankers, fuel tanks or fuel storage areas;

(c) persons or cargo;

(d) any other aircraft or aircraft hangar.

Note For each radar installation the sector area should be defined in terms of readily distinguishable dimensions preferably related to some feature of the aircraft and should appear in the Aircraft Maintenance Manual.

6.2.2 The equipment is not energised with the antenna stationary and the beam directed towards any of the objects specified in paragraph 6.2.1 unless the distance separating them from the antenna is in excess of 60 metres (200 ft).

6.2.3 The distance specified in paragraphs 6.2.1 and 6.2.2 may be reduced by 75 per cent when an approved beam attenuating device is used between the antenna and any object specified in paragraph 6.2.1.

6.2.4 The equipment is not energised in any radiating mode of operation when the aircraft in which the equipment is fitted is in a hangar or other enclosure unless a suitable microwave energy absorbing shield is fitted over the antenna.

6.2.5 The equipment is not to be operated in any aircraft which is being refuelled or defuelled.

Note During all testing of aircraft radar equipment the beam should, whenever possible, be directed with maximum upward tilt toward a clear area.

Appendix I

Fire safety requirements to be met by mechanical and electrical equipment within 15 metres (50 ft) of an aircraft's fuel tank filling points and vent outlets during fuelling operations

1 Application

1.1 The requirements of this Appendix are applicable to all mechanical and electrical equipment used within 15 metres (50 ft) of an aircraft's fuel tank filling points and vent outlets during fuelling operations.

1.2 Compliance with these requirements is the responsibility of the operator of the equipment.

2 Vehicles and plant

Note Because a higher standard of safety can be more readily achieved on diesel engines than petrol engines, it is recommended that diesel engines be used on all vehicles, pumping plants, etc., used within 15 metres (50 ft) of an aircraft's fuel tank filling points and outlet vents during fuelling operations.

2.1 All equipment shall be of good automotive design, and shall receive proper maintenance to ensure that it is kept in good state of repair. All reasonable means shall be taken to limit the hazard from fire. Particular attention shall be given to possible sources of ignition such as:

(a) incandescent carbon or naked flame which could be emitted from the engine or associated equipment; and

(b) arcing between metallic parts of electrical circuits and components caused by:

(i) operation of switch contacts; and

(ii) faulty cable terminations; and

(iii) breakdown of electrical insulation; and

(iv) moving contacts or rotary electrical equipment; and

(v) accidental short circuiting or open circuiting; and

(c) exposure of hot parts to combustible matter; and

(d) overheating of working parts to the ignition temperature of any combustible matter in the vicinity of the engines.

2.2 Parts of the equipment requiring attention are:

(a) fuel system; and

(b) exhaust system; and

(c) electrical system.

2.2.1 Fuel system

The carburettor air intake shall be fitted with a flame arrestor, such as a backfire non-return valve, or an efficient baffled and screened air cleaner.

The fuel tank shall be securely mounted, and the tank and its filler shall be positioned so that fuel cannot be inadvertently spilled on the engine, its exhaust, electrical and ignition system.

Fuel tank filling openings shall be fitted with well fitting caps.

Liquefied petroleum gas systems shall comply with Australian Standard 1425 and Australian Standard CB20, but excess flow valves and non-return valves shall be fitted irrespective of size of tank.

2.2.2 Exhaust System

The exhaust system shall be provided with means to prevent hazardous emission of incandescent carbon or naked flame. Baffled standard vehicle mufflers, of good automotive design, and in good condition are acceptable.

2.2.3 Electrical System

Standard vehicle wiring shall be maintained in good condition. All additional equipment such as obstruction lights, shall have wires and cables well supported, with insulating grommets fitted wherever they pass through metal panels. Equipment shall be suitably insulated and mechanically protected to prevent breakdown during use.

Batteries shall be suitably covered to prevent accidental shorting of cells and shall be provided with adequate means of natural ventilation.

3 Fuelling vehicles and plant

Aircraft fuelling vehicles and plant shall comply with the following:

(a) be fitted with an isolation switch between the battery and electrical services;

(b) the engine exhaust outlet to be remote from the fuelling equipment;

(c) all electrical wiring to the rear of the vehicle cab shall be mechanically protected;

(d) exposed electrical terminals shall be protected by insulating boots or covers;

(e) generators, motors, switches and relays shall be of a type which will prevent emission of hazardous sparks.

4 Electrical equipment

4.1 Equipment above ground level

All fixed and portable electrical equipment (other than vehicular) shall be of the same requirements as the SAA requirements as for equipment operated in Class 1, Division 2 locations, as specified in the SAA Wiring Rules, Part 1, except that arc-producing devices such as switches, contactors, etc., which are not operated during fuelling or defuelling operations need not to conform to the requirements for this class of equipment. The controls of all arc-producing devices which do not meet the requirements for Class 1, Division 2 locations shall be clearly labelled so that there is no doubt that they are not to be operated during fuelling operations.

4.2 Equipment below ground level

Electrical equipment located below the general ground level of the apron (such as apron power outlets, pump control switches, etc.) shall comply with the SAA requirements for equipment operated in Class 1, Division 1 locations.

4.3 Cables

(a) All cables carrying electrical current at potentials up to 250 volts with respect to earth shall be required to have 250 volt grade insulation and shall be protected by a plastic sheath resistant to attack by fuel and oil.

(b) All cables situated in areas traversed by vehicles, hand-carts and the like shall be suitably protected against mechanical damage. In no case shall this protection be of a lower standard than that provided by hardwood troughing with the dimensions by 2W and 3D where W and D are respectively width and depth of the cable space where W is not less than D.

(c) Where the use of trailing cables is permitted as a temporary measure, The appropriate placement of wooden or other suitable portable barriers may be used as an alternative to wooden troughing described in paragraph 4.3 (b) to guard against damage by vehicles and to ensure the safety of pedestrians.

4.4 Protective devices

All fuses and overload protective devices shall be hermetically sealed and protected by a general purpose enclosure.

4.5 Batteries

All batteries shall be suitably covered to prevent accidental shorting of cells and shall be provided with adequate means of natural ventilation.

4.6 Protection from breakdown in service

(a) All electrical equipment shall be suitably insulated and mechanically protected to prevent breakdown whilst in use.

(b) All connections shall be secured with spring or lock washers to prevent accidental loosening of connections whilst in use.

Notes to Civil Aviation Order 20.9

Note 1

The Civil Aviation Order (in force under the *Civil Aviation Regulations 1988*) as shown in this compilation comprises Civil Aviation Order 20.9 amended as indicated in the Tables below.

Table of Orders

Year and number	Date of notification in *Gazette*/ registration on FRLI	Date of commencement	Application, saving or transitional provisions
CAO 2004 No. R10	8 December 2004 (*see* F2005B00787)	8 December 2004 (*see* s. 2)	
CAO 20.9 2005 No. 1	FRLI 6 January 2006 (*see* F2006L00094)	7 January 2006 (*see* s. 2)	
CAO 20.9 2010 No. 1	FRLI 2 March 2010 (*see* F2010L00542)	3 March 2010 (*see* s. 2)	
CAO 20.9 2011 No. 1	FRLI 15 July 2011 (*see* F2011L01503)	16 July 2011 (*see* s. 2)	
CAO 20.9 2011 No. 2	FRLI 9 November 2011 (*see* F2011L02289)	10 November 2011 (*see* s. 2)	

Table of Amendments

ad. = added or inserted am. = amended rep.= repealed rs. = repealed and substituted

Provision affected	How affected
s. 20.9	rs. 2004 No. R10
subs. 3	am. CAO 20.9 2011 No. 2
subs. 4	am. CAO 20.09 2005 No. 1; CAO 20.9 2010 No. 1; CAO 20.9 2011 No. 1

Civil Aviation Amendment Order (No. R11) 2004

I, WILLIAM BRUCE BYRON, Director of Aviation Safety, on behalf of CASA, issue the following Civil Aviation Order under subregulation 235 (7) of the *Civil Aviation Regulations 1988*.

[Signed Bruce Byron]

Bruce Byron
Director of Aviation Safety and
Chief Executive Officer

2 December 2004

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1 Name of Order

This Order is the Civil Aviation Amendment Order (No. R11) 2004.

2 Commencement

This Order commences on gazettal.

3 Replacement of section 20.10 of the Civil Aviation Orders

Section 20.10 of the Civil Aviation Orders is omitted and a new section substituted as set out in Schedule 1.

Schedule 1 Substitution of section 20.10 of the Civil Aviation Orders

SECTION 20.10

HOT REFUELLING — HELICOPTERS

1 MEANING OF *HOT REFUELLING*

1.1 In this section, ***hot refuelling*** means the refuelling of a helicopter with its engine or engines running.

1.2 Hot refuelling of a helicopter may take place with its rotor or rotors rotating.

1A APPLICATION

1A.1 The hot refuelling of helicopters must be carried out in accordance with:

(a) the requirements set out in section 20.9 other than the requirements set out in paragraphs 4.1.1.1, 4.3.1, 4.3.8, 4.4.1, 4.5.1 and 5.1.4; and

(b) this section.

Note: Operators and pilots should note that the provisions of paragraph 5.1 of section 20.2 of the Civil Aviation Orders relating to the inspections and tests for the presence of water in an aircraft's fuel system before the start of each day's flying are applicable to helicopters to which this section applies.

2 OPERATOR'S RESPONSIBILITIES

2.1 Hot refuelling of a helicopter must not be carried out unless authorised by its operator.

2.2 Before authorising the hot refuelling of a helicopter, the operator must be satisfied that the refuelling can be carried out safely and, in particular, must have regard to:

(a) the configuration of the helicopter and its engine or engines; and

(b) the location of the components of the helicopter's fuel system; and

(c) the refuelling system or systems to be used and its or their components; and

(d) the helicopter's flight manual.

2.3 The operator of a helicopter who authorises hot refuelling of that helicopter must include in the operations manual:

(a) the operational circumstances in which hot refuelling may take place; and

(b) the procedures to be followed during hot refuelling; and

(c) the requirements and instructions, if any, set out in the helicopter's flight manual that relate to hot refuelling; and

(d) if applicable, the instructions to ensure fuel quality as required for the purposes of subparagraph 7.2 (b).

2.4 The operator must set out the matters referred to in paragraph 2.3 separately in relation to each type of helicopter to which the operations manual applies.

3 RESPONSIBILITIES OF PILOT IN COMMAND

3.1 Before allowing the hot refuelling of a helicopter to commence, the pilot in command must ensure that the refuelling can be carried out safely in accordance with this section and the procedures included in the operations manual.

3.2 The pilot in command must ensure that passengers are not on board during hot refuelling, except in the case of a passenger who cannot, in the opinion of the pilot or on medical advice, be safely disembarked.

3.3 Unless subsection 7 of Civil Aviation Order section 95.7 applies, a pilot with a licence that is valid for the helicopter must, at all times, be at the controls of the helicopter while refuelling is carried out.

3.4 While a pilot is at the controls of a helicopter, communication between the pilot and the person on the ground in charge of the refuelling system must be maintained by means of an electronic intercommunication system or by visual contact and an agreed system of signals.

4 PROCEDURES AND EQUIPMENT

4.1 All persons engaged in hot refuelling must be trained in, and familiar with, the procedures to be followed during hot refuelling or any emergency that may occur in relation to the refuelling.

4.2 Suitable and properly maintained fire fighting equipment must be readily available for use if an emergency occurs during the refuelling.

4.3 Before carrying out hot refuelling on an off-shore oil rig, gas rig or platform, a drilling ship or any other vessel, the approval of the operator or master of that installation or vessel must be obtained.

5 FUEL LOADING

5.1 The quantity of fuel to be loaded must be decided before hot refuelling is commenced.

5.2 A closed or open refuelling system may be used for hot refuelling.

5.3 If an open system of refuelling is used, there must be a means of quickly cutting off the fuel supply at the point of entry into the fuel tank of the helicopter.

5.4 Before the helicopter's fuel filler cap is removed, the refuelling equipment and the helicopter must be earthed and connected so as to ensure they are of the same electrical potential.

6 RADIO TRANSMISSIONS

6.1 While hot refuelling is taking place, radio transmissions from the helicopter must be restricted to the greatest extent practicable.

6.2 While hot refuelling is taking place, an HF transmitter or radar equipment on the helicopter must not be operated.

7 INSPECTION AND TESTING OF FUEL SYSTEM

7.1 The operator of a helicopter that has been hot refuelled must ensure that, on completion of each hot refuelling of the helicopter, the pilot in command inspects and tests the helicopter's fuel system for the presence of water.

7.2 Paragraph 7.1 does not apply:

(a) if the helicopter has, for a continuous period of not more than 5 hours' time in service, been engaged in operations during which hot refuelling has taken place; and

(b) if:

(i) the fuel used by the helicopter is supplied by a person:

(A) who has a fuel quality audit program; and

(B) whose regular audit reports are checked by the operator; or

(ii) in a case where the fuel used by the helicopter is supplied by a person who does not have a fuel quality audit program — the operator has a system for monitoring the quality of the fuel used by the helicopter.

Australian Government

Civil Aviation Safety Authority

Civil Aviation Order 20.11 (as amended)

made under subregulations 207 (2), 252 (1) and 253 (5) of the *Civil Aviation Regulations 1988*.

This compilation was prepared on 2 February 2009 taking into account amendments up to *Civil Aviation Order 20.11 Amendment Order (No. 1) 2008*.

Prepared by the Legislative Drafting Branch, Legal Services Group, Civil Aviation Safety Authority, Canberra.

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Section 20.11

Emergency and life saving equipment and passenger control in emergencies

1 Application

This section applies to all Australian registered aircraft, except where otherwise specified in these Orders.

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2 Definitions

In this section, unless a contrary intention appears:

handicapped person means a person requiring special attention because illness, injury, age, congenital malfunction, or other temporary or permanent incapacity or disability makes that person unable without special facilities or assistance to utilise air transport facilities and services as effectively as persons who are not so affected.

land aircraft means all aircraft other than amphibious aircraft when operating on water, helicopters equipped with fixed flotation equipment when operating on water, seaplanes and flying boats.

portable megaphone means a portable battery-powered megaphone that meets the performance standards set out in paragraph 6A.5.

3 Maintenance of emergency and lifesaving equipment

An operator must ensure that emergency and lifesaving equipment, carried or installed in an aircraft to meet the requirements of this section, is maintained in such condition that it will satisfactorily perform its design function.

5 Flotation equipment for overwater flights

5.1 Life jackets

5.1.1 Aircraft shall be equipped with 1 life jacket for each occupant when the aircraft is over water and at a distance from land:

(a) in the case of a single engine aircraft — greater than that which would allow the aircraft to reach land with the engine inoperative; and

(b) in the case of multi-engine aircraft — greater than 50 miles.

Note 1 For the purposes of this paragraph, ***land*** shall mean land suitable for an emergency landing.

Note 2 Except as specified in paragraph 5.1.2 below, the provisions of this paragraph need not apply to land aircraft departing from or landing at an aerodrome in accordance with a normal navigational procedure for departing from or landing at that aerodrome.

5.1.2 Land aircraft that carry passengers and are engaged in:

(a) regular public transport operations; or

(b) charter operations;

shall be equipped with a life jacket or flotation device for each occupant on all flights where the take-off or approach path is so disposed over water that in the event of a mishap occurring during the departure or the arrival it is reasonably possible that the aircraft would be forced to land onto water.

5.1.3 Where required by paragraph 5.1.1 or paragraph 5.1.2, a life jacket or individual flotation device shall be stowed at or immediately adjacent to each seat. In addition, sufficient additional life jackets or individual flotation devices shall be carried in easily accessible positions for use by infants or children for whom a life jacket or individual flotation device is not available at or adjacent to their seated position.

5.1.4 Amphibious aircraft when operating on water, helicopters equipped with fixed flotation equipment when operating on water, and all seaplanes and flying boats on all flights shall be equipped with:

(a) 1 life jacket for each occupant; and

(a) an additional number of life jackets (equal to at least one-fifth of the total number of occupants) in a readily accessible position near the exits.

5.1.5 Life jackets shall be so stowed in the aircraft that 1 life jacket is readily accessible to each occupant and, in the case of passengers, within easy reach of their seats.

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5.1.6 Life jackets must:

(a) comply with a standard approved by CASA; and

(b) be of an inflatable type; and

(c) except for an infant life jacket — have a whistle fitted in a suitable stowage.

5.1.7 Where life jackets are required to be carried in accordance with subparagraph 5.1.1 (a) each occupant shall wear a life jacket during flight over water. However, occupants of aeroplanes need not wear life jackets during flight above 2 000 feet above the water.

5.1.8 Where life jackets are required to be carried in accordance with paragraph 5.1.4 each occupant of a single engine aircraft shall wear a life jacket during flight over water when the aircraft is operated beyond gliding distance from land or water, as appropriate, suitable for an emergency landing. However, occupants need not wear life jackets when the aircraft is taking-off or landing at an aerodrome in accordance with a normal navigational procedure for departing from or arriving at that aerodrome, and occupants of aeroplanes need not wear life jackets during flight above 2 000 feet above the water.

5.1.9 Notwithstanding paragraph 5.1.8 above each occupant of a helicopter operating to or from an off-shore landing site located on a fixed platform or vessel shall wear a life jacket during the entire flight over water regardless of the class of operation or the one-engine-inoperative performance capability of the helicopter.

5.2 Life rafts

5.2.1 An aircraft that is flown over water at a distance from land greater than the permitted distance must carry, as part of its emergency and lifesaving equipment, sufficient life rafts to provide a place in a life raft for each person on board the aircraft.

5.2.1.1 For the purposes of paragraph 5.2.1, the permitted distance is:

(a) in the case of an aircraft that has:

(i) 4 engines; or

(ii) 3 turbine engines; or

(iii) 2 turbine engines and complies with section 20.7.1B;

a distance equal to 120 minutes at normal cruising speed, or 400 miles, whichever is the less; or

(b) in any other case — a distance equal to 30 minutes at normal cruising speed, or 100 miles, whichever is the less.

5.2.2 Notwithstanding the requirements of paragraph 5.2.1, CASA may require the carriage of life rafts on such other overwater flights as CASA considers necessary.

5.2.3 Life rafts carried in accordance with paragraph 5.2.1 shall be in addition to life jackets carried in accordance with paragraphs 5.1.1 and 5.1.2.

5.2.4 Life rafts carried in accordance with this section shall be stowed so as to be readily accessible in the event of a ditching without appreciable time for preparatory procedures. When life rafts are stowed in compartments or containers, such compartments or containers shall be appropriately and conspicuously marked. Where life raft stowages have to be installed in aircraft to meet the requirements of this section, such stowages shall comply with the requirements of Part 101 appropriate to the certification of the aircraft concerned.

5.2.5 Life rafts must comply with a standard approved by CASA.

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5.3 Helicopter flotation systems

5.3.1 A single engine helicopter engaged in passenger carrying charter operations shall be equipped with an approved flotation system whenever the helicopter is operated beyond autorotative gliding distance from land. However, when following a helicopter access lane prescribed in AIP-ERSA, or when departing from or landing at a helicopter landing site in accordance with a normal navigational procedure for departing from or landing at that site, an approved flotation system is not required.

5.3.2 A single engine helicopter engaged in regular public transport operations shall be equipped with an approved flotation system whenever the helicopter is operated beyond autorotative gliding distance from land.

5.3.3 A multi-engine helicopter engaged in passenger carrying charter or regular public transport operations over water and which is not operated in accordance with one-engine-inoperative accountability procedures shall be equipped with an approved flotation system.

6 Emergency signalling equipment

6.1 An aircraft required to carry life rafts under paragraph 5.2.1 or 5.2.2 must be fitted with, or carry, the following emergency signalling equipment:

(a) when 1 life raft is carried — at least 1 approved ELT or 1 approved portable ELT;

(b) when more than 1 life raft is carried — at least:

(i) 1 approved ELT and 1 approved portable ELT; or

(ii) 2 approved portable ELTs;

(c) a supply of pyrotechnic distress signals.

Note If carrying an approved portable ELT to comply with this paragraph, CASA ***recommends*** an emergency position indicating radio beacon (an EPIRB).

6.2 A single engine aircraft must be fitted with, or carry, at least 1 approved ELT or 1 approved portable ELT if it is:

(a) on a flight over water; and

(b) not required to carry a life raft under paragraph 5.2.1 or 5.2.2; and

(c) either:

(i) not equipped with radio communication equipment; or

(ii) not capable of continuous air-ground communication.

Note If carrying an approved portable ELT to comply with this paragraph, CASA ***recommends*** an emergency position indicating radio beacon (an EPIRB).

6.3 If an approved portable ELT that is carried is an emergency position indicating radio beacon (an EPIRB), it must be carried:

(a) in, or adjacent to, a life raft; or

(b) adjacent to an emergency exit used for evacuation of the aircraft in an emergency.

6.4 If an approved portable ELT that is carried is a personal locator beacon (a PLB), it must be carried:

(a) on the person of a member of the operating crew; or

(b) in, or adjacent to, a life raft; or

(c) adjacent to an emergency exit used for evacuation of the aircraft in an emergency.

6.5 The pilot in command of an aircraft must not begin a flight, and the operator must ensure that the flight is not begun, if an approved ELT or approved portable ELT on

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board the aircraft for this subsection has not successfully undergone the periodic inspection and testing recommended for it by its manufacturer.

Note For the maintenance requirements for emergency locator transmitters see also Part 4A of the *Civil Aviation Regulations 1988*.

6.6 Before an approved ELT or approved portable ELT may be used in an aircraft for this subsection, it must be registered with the Australian Maritime Safety Authority.

6.7 In this subsection:

approved ELT has the same meaning as in subregulation 252A (7) of the *Civil Aviation Regulations 1988* (***CAR 1988***).

approved portable ELT has the same meaning as in subregulation 252A (7) of CAR 1988.

6A Portable megaphones

6A.1 This subsection applies to an aircraft that:

(a) is engaged in:

(i) regular public transport operations; or

(ii) charter operations for the purpose of carrying passengers; and

(b) has a passenger seating capacity of more than 60 seats; and

(c) is carrying at least 1 passenger.

6A.2 An aircraft to which this subsection applies must carry:

(a) if it has a passenger seating capacity of less than 100 seats — 1 portable megaphone; or

(b) otherwise — 2 portable megaphones.

6A.3 If 1 megaphone is carried in an aircraft under this subsection, it must be kept in a place where it is readily accessible from a crew member's seat.

6A.4 If 2 megaphones are carried in an aircraft under this subsection, they must be distributed through the passenger cabin or cabins so as to be readily accessible to crew members.

6A.5 Each portable megaphone must meet the following performance standards:

(a) it must be able to perform its function throughout any flight on which it is carried; and

(b) it must be designed for ease of handling and use with 1 hand; and

(c) it must have a volume control or adequate acoustic feedback suppression.

7 Survival equipment

7.1 An aircraft shall carry survival equipment for sustaining life appropriate to the area being overflown on the following flights:

(a) where the carriage of life rafts are required by paragraphs 5.2.1 and 5.2.2;

(b) during operations within or through the remote areas specified in Appendix III;

(c) on such other flights as may be directed by CASA.

8 Accessories for water operations

8.1 Amphibious aircraft when operating over water and all seaplanes and flying boats shall carry at least 1 sea anchor (drogue) and appropriate fittings shall be provided for the attachment of the sea anchor to the aircraft.

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9 Illumination of emergency exits

9.1 Where an aircraft, which is equipped with an emergency lighting system in compliance with airworthiness directive Part 39-105 AD/General/4, is in flight and less than 1 000 feet above the terrain or on the ground with passengers on board, then either:

(a) the emergency lighting system shall be switched on; or

(b) the normal cabin lights shall be switched on and the emergency lighting system shall be armed.

10 Emergency procedures

10.1 The operator of an aircraft engaged on charter or regular public transport operations shall specify in the aircraft's operations manual the procedures for handling:

(a) emergency decompression, where appropriate; and

(b) fire on the ground or in the air; and

(c) flight crew compartment impact drill; and

(d) emergency evacuation; and

(e) ditching, where appropriate.

11 Assignment of emergency duties

11.1 The operator and, where appropriate, the pilot in command, of an aircraft engaged on charter or regular public transport operations shall assign to each category of required crew member, as appropriate, the necessary functions to be performed in an emergency or situation requiring emergency evacuation. These functions shall be realistic, practicable and such as to ensure that any reasonably anticipated emergency can be adequately handled and shall take into consideration the possible incapacitation of individual crew members.

12 Crew member proficiency in the execution of emergency procedures

12.1 A crew member shall not be assigned or accept assignment to emergency duties in an aircraft engaged in a charter or a regular public transport operation unless he has undertaken and passed the proficiency test specified in Appendix IV of this section on that type of aircraft.

12.2 Subject to paragraph 12.6, the proficiency test shall be taken and passed annually.

12.3 Subject to paragraph 12.3.1, the proficiency test to be undertaken by a crew member of an aircraft is to be conducted by:

(a) CASA; or

(b) a person approved by CASA for the purpose; or

(c) the person appointed as Chief Pilot by the operator of the aircraft.

12.3.1 To remove any doubt, it is stated that a Chief Pilot who is a crew member of an aircraft cannot conduct the proficiency test that, as a crew member, he or she is required to undertake.

12.4 Upon satisfactory completion of the proficiency test a certificate to the effect that the crew member has passed the test shall be issued to the operator by the person who conducted the test. A certificate issued under this paragraph shall be current for a period of twelve months after the date of issue thereof.

12.5 An operator shall retain all certificates issued to him in accordance with paragraph 12.4 and shall keep and maintain a record containing the following particulars:

(a) the names of crew members who have undertaken the proficiency test;

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(b) the dates on which a member has undertaken the proficiency test;

(c) the results of all proficiency tests undertaken by any crew member.

12.6 A proficiency test undertaken within a period of ninety days immediately preceding the expiry date of a certificate issued under paragraph 12.4 shall be deemed to have been undertaken on the expiry date of that certificate.

13 Cabin attendants

13.1 Number of attendants

Aircraft engaged in the carriage of passengers on regular public transport operations shall contain at least the number of cabin attendants specified in section 20.16.3.

13.2 Seating position

At all times when they are required to wear seat belts cabin attendants shall be distributed uniformly throughout the passenger compartment or compartments, seated as near as practicable to emergency exits and each section of the aisle(s) shall be under the surveillance of at least 1 cabin attendant.

13.3 Training

Cabin attendants shall not be assigned to emergency duties on an aircraft unless in addition to the requirements of subsection 12 they have been given instruction in the following on that aircraft:

(a) a general description of the aircraft;

(b) a knowledge of all crew member's assignment, functions and responsibilities during an evacuation or ditching;

(c) briefing of passengers;

(d) use of public address system, where fitted, and means of communicating with the cockpit; and

(e) location and use of first aid equipment.

14 Briefing of passengers

14.1 General

14.1.1 The operator of an aircraft shall ensure that all passengers are orally briefed before each take-off on:

(a) smoking, including the prohibition of smoking in toilets; and

(b) the use and adjustment of seat belts; and

(c) the location of emergency exits; and

(d) the use of oxygen where applicable; and

(e) the use of flotation devices where applicable; and

(f) stowage of hand luggage; and

(g) the presence on board of special survival equipment where applicable.

14.1.2 The operator of an aircraft shall ensure that a handicapped person, and the person assisting the handicapped person, if any, is given individual briefing appropriate to the needs of that person in the procedures to be followed in the event of emergency evacuation of the aircraft. The briefing should include which emergency exit to use and when to move to the exit. The person giving the briefing should also enquire as to the most appropriate manner of assisting the handicapped person so as to prevent pain or injury to that person.

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14.1.3 The operator of a charter or regular public transport aircraft with a seating capacity of more than 6, including crew, shall supplement the oral briefing required by paragraph 14.1.1 with printed matter carried in convenient locations for the use of passengers and containing:

(a) diagrams of the emergency exits and methods of operating; and

(b) other instructions necessary for the use of emergency equipment; and

(c) the brace position for emergency landing or ditching.

14.1.4 Each card required by paragraph 14.1.3 shall contain only information that is pertinent to the type and model aircraft being used for the flight. Different seating configuration for a particular aircraft may be included on 1 card providing the oral briefing includes advice of the configuration in use.

14.1.5 In the case of aircraft engaged on charter or regular public transport operations, the procedures to be followed in the briefing required by paragraph 14.1.1 shall be specified in the aircraft's operations manual or in another document specified in the operations manual.

14.1.6 Aircraft engaged on regular public transport operations with a passenger seating capacity of 10 seats or more shall be equipped with an approved and serviceable electronic public address system for the purpose of making announcements relative to emergency procedures. The system shall be an integral part of the aircraft and shall be accessible and capable of immediate operation by the pilot in command, the co-pilot or an appropriately trained crew member. The transmission shall be audible throughout the passenger cabin.

14.2 Overwater operations

14.2.1 In addition to the oral briefing required by paragraph 14.1.1, the operator of an aircraft required to carry life jackets or other individual flotation devices, and where appropriate life rafts, in accordance with paragraphs 5.1.1, 5.1.2, 5.1.4, 5.2.1 and 5.2.2 shall ensure that all passengers are orally briefed by a crew member on the location and use of any individual flotation devices, including the method of donning and inflating a life jacket, and the location of life rafts. In the case of aircraft engaged on charter or regular public transport operations required to carry life jackets in accordance with paragraphs 5.1.1 or 5.1.4, this briefing shall include a demonstration of the method of donning and inflating a life jacket.

14.2.2 In the case of aircraft engaged on charter or regular public transport operations, the procedure to be followed in the briefing required by paragraph 14.2.1 shall be specified in the aircraft's operations manual or in another document called up by the operations manual.

14.2.3 Where an aircraft proceeds directly overwater after take-off, the briefing required by paragraph 14.2.1 shall be done before take-off.

14.2.4 Where the aircraft does not proceed directly overwater after take-off, no part of the briefing required by paragraph 14.2.1 need be given before take-off, but the complete briefing must be given before the aircraft reaches the overwater part of the flight.

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15 Demonstration of emergency evacuation procedures

15.1 Emergency evacuation requirements

15.1.1 This subsection applies to an operator of a type and model of aircraft having a seating capacity of more than 44 passengers that is to be used in passenger carrying operations:

(a) upon the initial introduction by the operator of that type and model of aircraft into passenger carrying operations; or

(b) if the operator's emergency evacuation procedures for that type and model have previously been accepted by CASA as satisfactory — upon increasing by more than 5% the passenger seating capacity of that type and model; or

(c) upon a major change in the passenger cabin interior configuration that will affect the emergency evacuation of passengers.

15.1.2 The type and model of aircraft must be shown to have satisfied the requirements of the United States Federal Aviation Regulations 25.803 (or any other requirements that CASA accepts as being of an equivalent standard) at the time it was granted its type certificate.

15.1.3 The operator must not operate that type and model of aircraft unless the operator has satisfied CASA that the evacuation procedures and training introduced by the operator will enable crew members to achieve an evacuation capability equivalent to that achieved when the type and model of aircraft satisfied the requirements of FAR 25.803 or other requirements accepted by CASA in accordance with paragraph 15.1.2.

15.1.4 For the purposes of paragraph 15.1.3, CASA may require the operator, under simulated emergency conditions, to carry out an evacuation of all or part of the full seating capacity, including the number of crew members required for the aircraft, in accordance with any conditions that it considers necessary.

15.2 Ditching demonstration

15.2.1 Before each type and model of aircraft with a seating capacity of more than 44 passengers is used for the carriage of passengers on charter or regular public transport operations where life rafts are required by subsection 5 the operator shall unless specifically exempted by CASA, show by demonstration in accordance with Appendix II of this section that the ditching procedures allow for the removal of the rafts and the evacuation of the occupants from the aircraft in an orderly and expeditious manner. The exits selected for the demonstration shall be approved by CASA.

15.2.1.1 When considering whether to grant an exemption against the requirement for a ditching demonstration, CASA shall take into account the availability and realism of training equipment, ditching demonstrations carried out by the operator on similar aircraft types, and such other factors as he may consider relevant.

15.2.2 Where a significant re-arrangement is made in the location of the life rafts or in the passenger cabin interior configuration for which a successful demonstration has been conducted, the need for further demonstration shall be referred to CASA for consideration.

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Appendix II

Criteria for ditching demonstration

1 The demonstration may be done under daylight conditions.

2 The aircraft's normal electrical power sources shall be de-energised at the commencement of the evacuation.

3 The demonstration shall include the pre-ditching procedures prescribed in the relevant aircraft operations manual and full use shall be made of the emergency equipment normally available. Where rafts and accessories are relocated in accordance with these procedures, they shall be restrained so as to prevent them moving under the maximum accelerations to be expected in a ditching.

4 Not more than 50 per cent of the aircraft's emergency exits shall be used for the demonstration and they shall be representative of all the emergency exits on the aircraft. At least 1 exit used shall be a floor level exit. Exits not nominated for use in the demonstration shall be so indicated by red lights, red tape, or other acceptable means, placed outside the exits to indicate fire or other reason that the exits are unusable.

5 Platforms or stairs shall be placed at each emergency exit and adjacent to the wings for escape from overwing exits with the top of the platforms or stairs at a height simulating the water level following a ditching.

6 A crew complement not exceeding the number normally carried shall be on board the aircraft and each crew member shall be a member of a regularly scheduled line crew.

7 The seating density and arrangement of the aircraft shall be representative of the highest passenger version of that aircraft the operator operates or proposes to operate.

8 A representative passenger load of persons in normal health, none of them crew members, training personnel, aircraft engineers or traffic officers, shall be used. At least 10 per cent of the passengers shall be above 50 years of age, at least 30 per cent shall be above 40 years of age and at least 60 per cent shall be above 30 years of age. At least 30 per cent of the passengers shall be females prorated through the age group 18 years to 60 years and at least 5 per cent but no more than 10 per cent shall be children under 12 years of age, prorated through that age group. Three life-size dolls, in addition to the total passenger load, shall be carried by passengers to simulate infants 2 years old or younger. The clothing worn by the passengers shall be as normally worn when travelling by air.

9 No crew member or passenger shall have participated in an emergency evacuation demonstration within the preceding 6 months.

10 No crew member or passenger shall be given prior knowledge of the emergency exits available for the demonstration.

11 To prevent disclosure of the emergency exits to be used, either all passenger and cockpit windows shall be blacked out, or mats on the ground or the wings, or ramps or stands with stairs (or similar devices) at the wings, shall be placed at emergency exit positions in equal number on each side of the aircraft.

12 The operator shall not rehearse the demonstration for the participants, nor inform the passengers of the nature of the exercise except that they may be advised that they will be participating in an evaluation of safety procedures.

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13 Passengers shall not be assigned to specified seats but CASA may require that passengers be assigned to different seats.

14 All emergency equipment must be installed as for normal flight.

15 Each external door and exit, and each internal door or curtain, shall be in position as for normal flight.

16 Each crew member shall be in his/her seat normally assigned for a ditching prior to the commencement of the evacuation and shall remain seated until the signal to evacuate is given.

17 Each occupant shall don a life jacket before the commencement of the evacuation and shall wear the jacket when leaving the aircraft.

18 All the occupants shall have their safety belts and shoulder harnesses (where fitted) fastened at the time of the simulated ditching.

19 The demonstration shall include the removal of the rafts and accessories from the aircraft but the rafts and accessory packs need not be opened.

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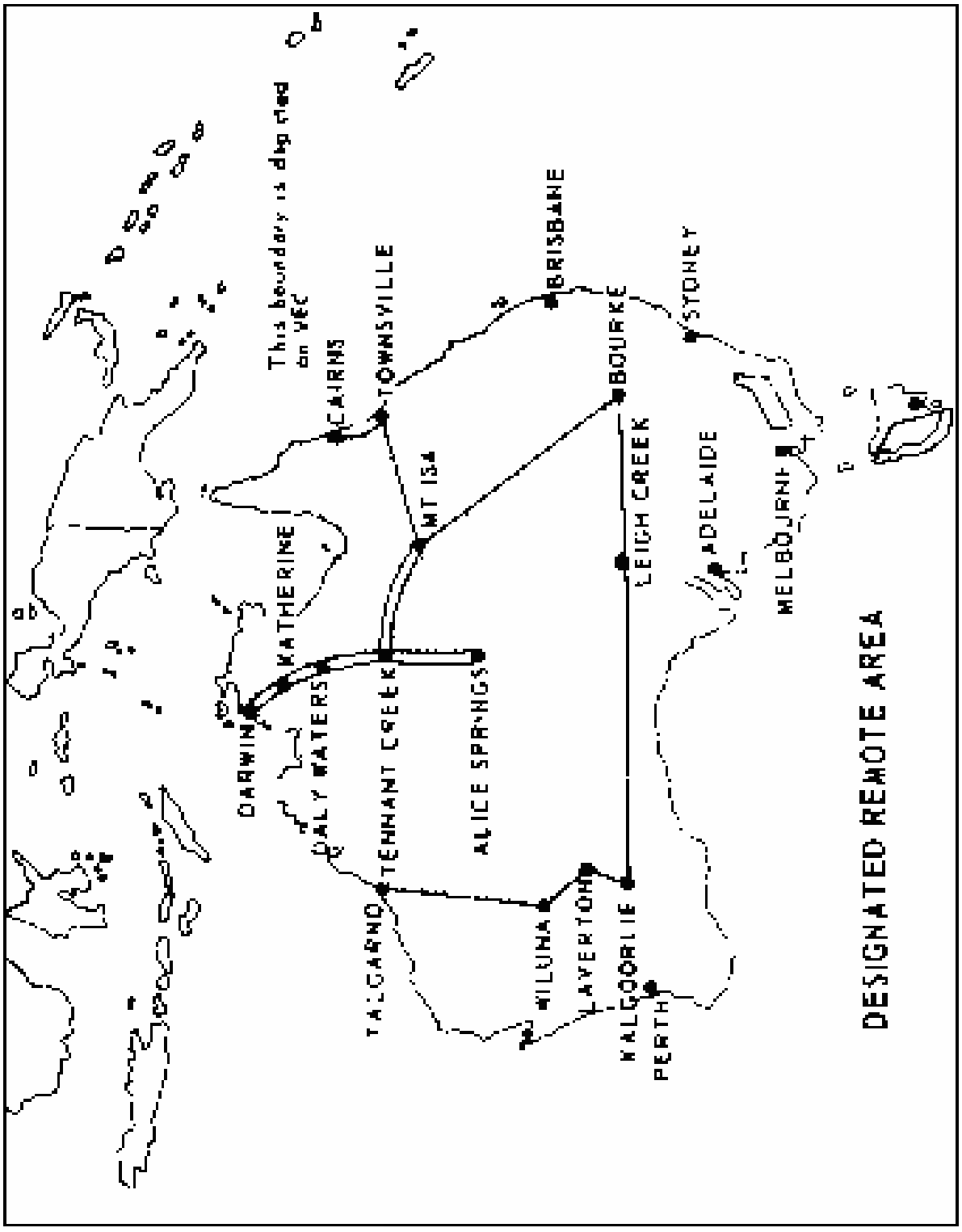
Appendix III



Note 3 Mainland within 50 n.m. of Darwin excluded from Designated Remote Area.

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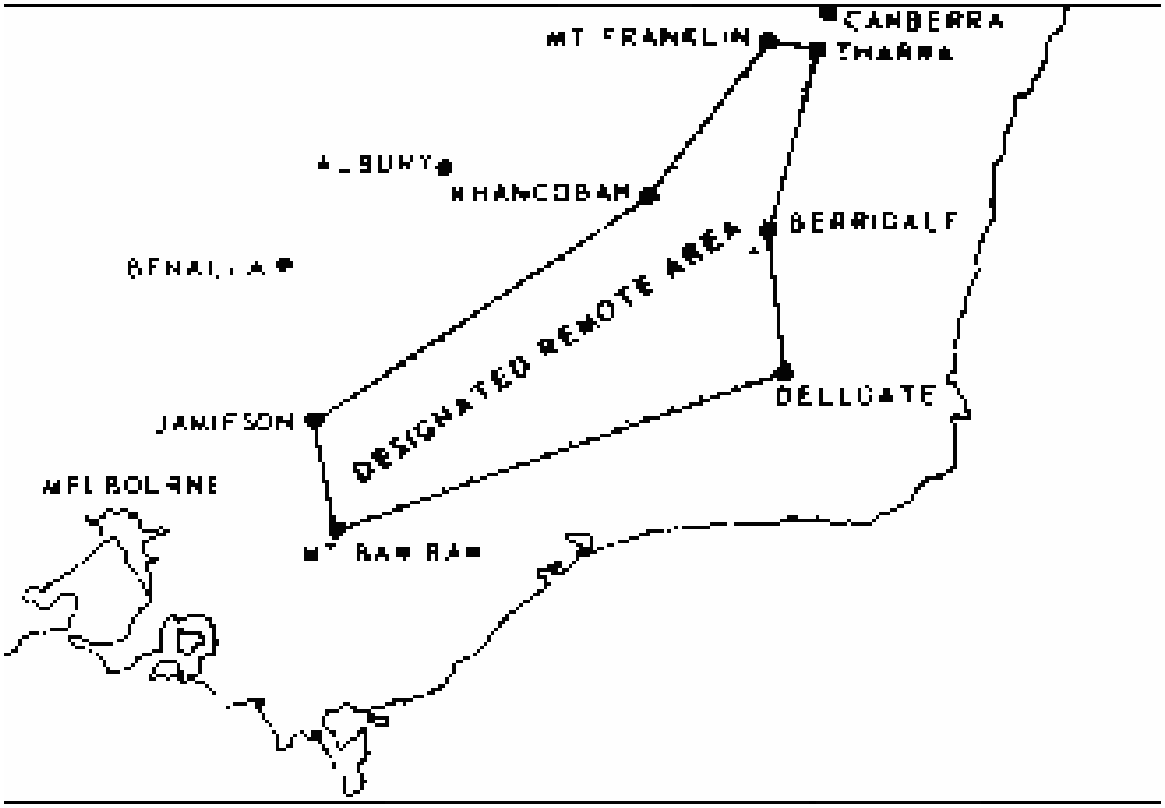

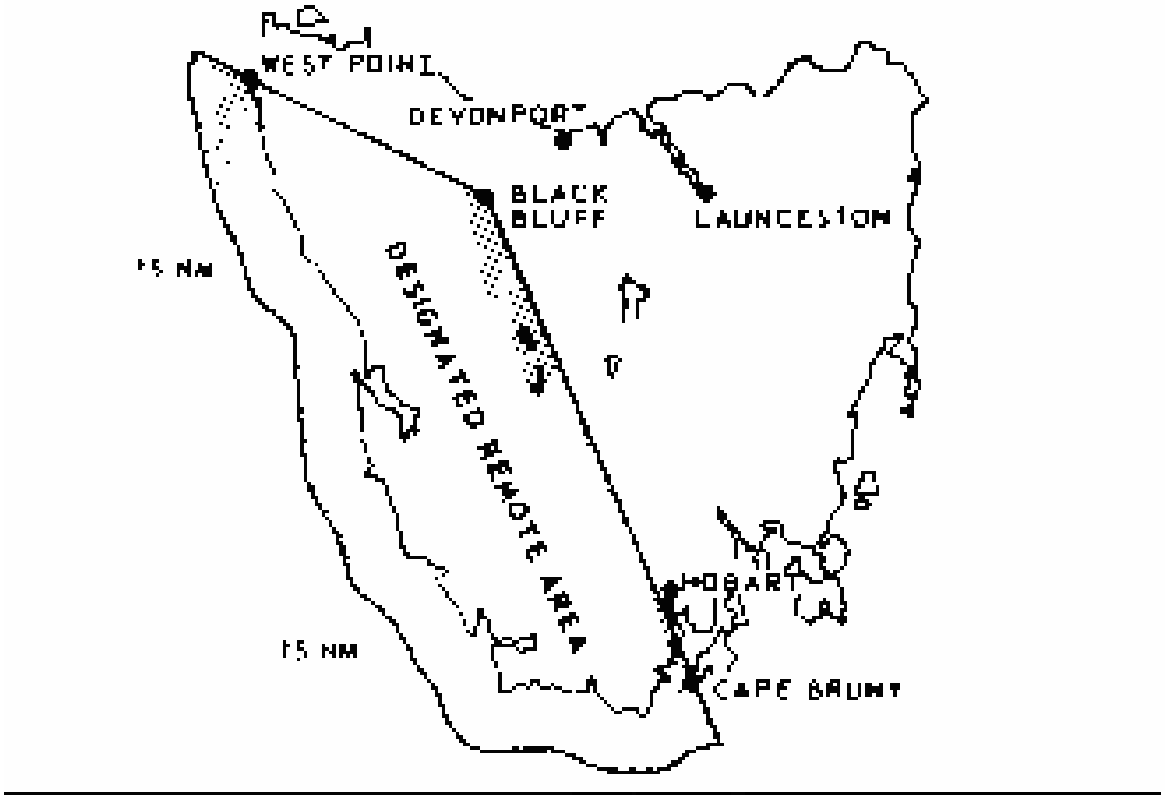

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Appendix IV

Crew member emergency procedures proficiency test

The proficiency test shall cover all of those emergency procedures that the crew member may be called upon to perform. It shall include at least the following.

1 Practical operation

1.1 **Emergency evacuation procedures**. Operation and use of each type of normal and emergency exit, evacuation slide and escape rope and procedures for evacuation.

1.2 **Fire extinguishing**. Method of operation of each type of portable fire extinguisher.

1.3 **Oxygen**. Methods of use of fixed and portable oxygen equipment.

1.3A **Portable megaphones**. Method of operation of each type of portable megaphone.

1.4 **Ditching procedures**, where applicable:

(a) fitting and inflation of life jackets and location and use of equipment stowed as part of the life jacket. Additionally, for initial qualification each crew member shall demonstrate competency in the use of the life jacket in the water; and

(b) removal from stowage, launching and inflation of life rafts. For initial qualification each crew member shall demonstrate proficiency in his or her assigned duties. Thereafter all crew members shall be given an annual demonstration of launching and inflation and shall demonstrate competency in boarding procedures and the use of the life raft and its equipment; and

(c) use of signalling equipment; and

(d) use of first aid kits.

1.5 Subject to the approval of CASA, realistic mock-ups of emergency equipment may be used. Where the replacing of a particular item of equipment such as rafts, exits, slides, etc., would involve an excessive amount of maintenance action an operator may, subject to the approval of CASA, provide a group demonstration of the operation of the equipment. In this event the group demonstration must be supported by an approved pictorial presentation. Each crew member must satisfy the person certifying to competency that he has an adequate knowledge of the emergency operation of equipment and, if necessary, that he has physically assessed the difficulty involved in operating it.

1.6 When operation or use of the emergency mechanism may cause damage to the aircraft or equipment or be a hazard to personnel an approved pictorial or simulated presentation may be used. For the proficiency test the crew member must satisfy the person certifying to competency that he has an adequate knowledge of the emergency operation of the mechanism.

2 Theoretical knowledge

2.1 Fire extinguishing:

(a) a knowledge of the location and types of extinguishers carried and of fires for which each type of extinguisher should be used; and

(b) a knowledge of whether the contents of the fire extinguishers and the products of extinguishing fires are toxic or likely to adversely affect breathing; and

(c) any precautions to be observed in the operation of fire extinguishers.

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2.2 Oxygen. Applicable to operations on pressurised aircraft and where the provision of oxygen is required.

(a) A knowledge of the effects of altitude on:

(i) respiration; and

(ii) hypoxia; and

(iii) duration of consciousness at various altitudes without supplemental oxygen; and

(iv) gas expansion; and

(v) gas bubble formation.

(b) A knowledge of:

(i) the physical phenomena of decompression; and

(ii) precautions in use of oxygen; and

(iii) location of oxygen equipment carried.

2.3 Survival. Knowledge of survival methods on land and water, including stowage location of survival beacons, etc.

2.4 Control of passengers during emergencies including emergency evacuation:

(a) methods of control, e.g. psychological, physical; and

(b) stowage location and correct use of restraint equipment; and

(c) handling of disabled passengers; and

(d) handling of deranged passengers and others whose conduct might jeopardise the safety of the aircraft; and

(e) action to be taken in the event of a hijack or attempted hijack.

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Notes to Civil Aviation Order 20.11

Note 1

The Civil Aviation Order (in force under the *Civil Aviation Act 1988*) as shown in this compilation comprises Civil Aviation Order 20.11 amended as indicated in the Tables below.

Table of Orders

Year and number	Date of notification in *Gazette*/ registration on FRLI	Date of commencement	Application, saving or transitional provisions
CAO 2004 No. R13	8 December 2004	8 December 2004 (*see* s. 2)	
CAO 20.11 2007 No. 1	FRLI 23 July 2007	24 July 2007 (*see* s. 2)	
CAO 20.11 2007 No. 2	FRLI 31 October 2007	1 November 2007 (*see* s. 2)	
CAO 20.11 2008 No. 1	FRLI 20 January 2009	1 February 2009 (*see* s. 2)	

Table of Amendments

ad. = added or inserted am. = amended rep. = repealed rs. = repealed and substituted

Provision affected	How affected
s. 20.11	rs. 2004 No. R13
subs. 5	am. CAO 20.11 2007 No. 1; CAO 20.11 2007 No. 2
subs. 6	rs. CAO 20.11 2008 No. 1

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Australian Government

Civil Aviation Safety Authority

Civil Aviation Order 20.16.1 – Air service operations – loading – general as amended

made under regulation 5 and subregulation 235 (7) of the *Civil Aviation Regulations 1988.*

This compilation was prepared on 12 July 2018 taking into account amendments up to *Civil Aviation Order 20.16.1 Amendment Instrument 2018 (No. 1).* It is a compilation of *Civil Aviation Order 20.16.1 – Air service operations – loading – general* as amended and in force on 30 June 2018.

Prepared by the Advisory & Drafting Branch, Legal & Regulatory Affairs Division, Civil Aviation Safety Authority, Canberra.

Compilation No. 3.

Contents

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Section 20.16.1

Air service operations – loading – general

1 Application

This Order applies to all Australian aircraft except balloons.

2 Definitions

In this Order:

aerial application operation has the meaning given by regulation 61.010 of the *Civil Aviation Safety Regulations 1998*.

Approved Loading System means a system prepared by an operator in accordance with the requirements of Civil Aviation Order 100.7, and approved by CASA or the holder of an appropriate and valid Weight Control Authority for ensuring that an aircraft is loaded within approved limits at all times during flight.

empty weight, of an aircraft, has the meaning given by subsection 2 of Civil Aviation Order 100.7.

Load Sheet means a form for recording the weight and disposition of the disposable load together with other pertinent loading information.

Approved Load Controller means a person nominated by an operator and approved by CASA to carry out all or any of the duties involved in the control and supervision of aircraft loading in a particular aircraft. The pilot in command or the co-pilot of an aircraft may undertake the duties and assume the responsibilities of an approved load controller without special authorisation by CASA.

3 Loading system

Where an aircraft has an approved loading system, the operator and the pilot in command shall ensure that the aircraft is loaded at all times in accordance with that system.

Note 1 Civil Aviation Order 100.7 requires all aircraft, except balloons, to have a loading system unless it can be shown that the aircraft cannot possibly be loaded so that its centre of the gravity falls outside the approved range, observing all limitations on compartment loads.

Note 2 Some acceptable types of loading systems are given in the CASA publication titled 'Weight Control of Aircraft'. Where the necessary limitations can be presented in placard form, such placards prominently displayed in the aircraft may be an acceptable type of loading system.

5 Load sheets

5.1 Subject to paragraph 5.1.1, the requirements of this paragraph are applicable to aircraft having a maximum take-off weight exceeding 5 700 kg and all aircraft engaged in regular public transport operations.

5.1.1 Paragraph 5.1 does not apply to an aircraft having a maximum take-off weight exceeding 5 700 kg while it is engaged in an aerial application operation.

5.2 Except as provided in paragraph 5.2.1 and 5.2.2, the operator and the pilot in command shall ensure that a load sheet is completed prior to departure of the aircraft on each stage of every flight.

5.2.1 Where the flight involves a number of stages, a supplementary load sheet based on the loading at the initial stage and accounting for all changes in the load may be used for each subsequent stage on the same day.

5.2.2 Where a standard load is carried on a number of consecutive flights on the same day from the same aerodrome, a load sheet completed for the first flight will meet the requirements of paragraph 5.1 for the subsequent flights if there is no change in any condition which could adversely affect the performance of the aircraft.

5.3 A load sheet shall contain the following and shall be signed by the pilot in command, the co-pilot or an approved load controller:

(a) name of pilot in command;

(b) date;

(c) aircraft type and registration marking;

(d) aerodromes of departure and destination;

(e) the aircraft's empty weight;

(f) weights of:

(i) occupants;

(ii) cargo;

(iii) removable equipment;

(iv) fuel and consumables (e.g. water methanol);

(g) the loaded aircraft weight with evidence that the centre of gravity is within the approved limits;

(h) the maximum allowable weight for the flight having regard to the requirements of section 20.7.0.

5.4 The operator and pilot shall ensure that the load sheet is carried in the aircraft and, in the case of aircraft engaged in regular public transport services, that a copy is retained on the ground at the aerodrome of departure.

5.4.1 The operator shall retain a copy of each load sheet for a period of 3 months after the relevant flight.

7 Passenger lists

When passengers are carried on a charter or regular public transport flight, the operator or the operator's representative shall compile a passenger list and leave it for retention at the aerodrome of departure. The list shall contain the aircraft registration, the names of passengers carried, the date and estimated time of departure, and the places of embarkation and destination.

Note to Civil Aviation Order 20.16.1

Note 1

The Civil Aviation Order (in force under the *Civil Aviation Regulations 1988*) as shown in this compilation comprises Civil Aviation Order 20.16.1 amended as indicated in the Tables below.

Table of Orders

Year and number	Date of notification in *Gazette*/ registration on FRLI	Date of commencement	Application, saving or transitional provisions
CAO 2004 No. R15	8 December 2004	8 December 2004 (*see* s. 2)	
CAO 20.16.1 2007 No. 1	FRLI 20 December 2007 (see F2007L04938)	21 December 2007 (*see* s. 2)	
CAO (Flight Crew Licensing) Repeal and Amendment Instrument 2014 (No. 1)	FRLI 29 August 2014 (see F2015L01177)	1 September 2014 (*see* s. 2)	Sections 3 and 31 (see Table A)
CAO 20.16.1 Amendment Instrument 2018 (No. 1)	FRL 29 June 2018 (see F2018L00962)	30 June 2018 (*see* s. 2)	

Table of Amendments

ad. = added or inserted am. = amended rep. = repealed rs. = repealed and substituted

Provision affected	How affected
s. 20.16.1	rs. CAO 2004 No. R15
subs. 1	rs. CAO 20.16.1 2007 No. 1
subs. 2	am. CAO (Flight Crew Licensing) Repeal and Amendment Instrument 2014 (No. 1), CAO 20.16.1 Amendment Instrument 2018 (No. 1)
subs. 3, Note 1	am. CAO 20.16.1 2007 No. 1, CAO 20.16.1 Amendment Instrument 2018 (No. 1)
subs. 5	am. CAO (Flight Crew Licensing) Repeal and Amendment Instrument 2014 (No. 1), CAO 20.16.1 Amendment Instrument 2018 (No. 1)
subs. 6	rep. CAO 20.16.1 Amendment Instrument 2018 (No. 1)
subs. 7	am. CAO 20.16.1 Amendment Instrument 2018 (No. 1)

Table A Application, saving or transitional provisions

Sections 3 and 31 of Civil Aviation Order (Flight Crew Licensing) Repeal and Amendment Instrument 2014 (No. 1) read as follows:

3 Definitions

(1) In this instrument:

continued authorisation has the meaning given by regulation 202.261 of the *Civil Aviation Safety Regulations 1998* (***CASR 1998***).

new authorisation has the meaning given by regulation 202.261 of CASR 1998.

(2) A reference in this instrument to a Civil Aviation Order identified by a specified number is taken to include a reference to the section of the Civil Aviation Orders with that number.

Note Some existing legislative instruments are referred to as a Civil Aviation Order followed by a number. Other instruments are referred to as a section of the Civil Aviation Orders. For consistency, in this instrument, all such instruments are referred to as a Civil Aviation Order followed by a number. For example, a reference to Civil Aviation Order 40.2.2 is taken to include a reference to section 40.2.2 of the Civil Aviation Orders.

31 Transitional — application of Civil Aviation Orders

The Civil Aviation Orders apply to a continued authorisation as if it were the equivalent new authorisation.

Civil Aviation Amendment Order (No. R16) 2004

I, WILLIAM BRUCE BYRON, Director of Aviation Safety, on behalf of CASA, issue the following Civil Aviation Order under subregulation 244 (2) of the *Civil Aviation Regulations 1988*.

[Signed Bruce Byron]

Bruce Byron
Director of Aviation Safety and
Chief Executive Officer

2 December 2004

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1 Name of Order

This Order is the Civil Aviation Amendment Order (No. R16) 2004.

2 Commencement

This Order commences on gazettal.

3 Replacement of section 20.16.2 of the Civil Aviation Orders

Section 20.16.2 of the Civil Aviation Orders is omitted and a new section substituted as set out in Schedule 1.

Schedule 1 Substitution of section 20.16.2 of the Civil Aviation Orders

SECTION 20.16.2

AIR SERVICE OPERATIONS — LOADING — GENERAL

1 APPLICATION

This section applies to all Australian aircraft.

2 DEFINITIONS

Cargo means things other than persons carried in an aircraft.

3 RESTRAINT

3.1 Cargo stowed on or above the floor line of compartments occupied by persons and behind any person shall be restrained so as to prevent any article from moving under the maximum accelerations to be expected in flight and in an emergency alighting such as a ditching.

3.2 Cargo stowed in areas other than those covered by paragraph 3.1 shall be restrained so as to prevent any article from moving under the maximum accelerations to be expected in flight, in a heavy landing, and in a ground loop.

3.3 The strength of the restraint provisions for compliance with paragraphs 3.1 and 3.2 shall be not less than that approved or accepted by CASA for a particular type of aircraft.

3.4 Cargo restraint equipment shall be flame resistant.

4 STOWAGE

4.1 Cargo shall not be carried in any place where it may damage, obstruct or cause failure of controls, electrical wiring, pipe lines and items of aircraft equipment, essential to the safe operation of the aircraft, unless such items are adequately protected during loading and handling of cargo and during the operation of the aircraft.

4.2 Cargo may obstruct an emergency exit where sufficient other emergency exits are available for the number of occupants carried in accordance with the tables in Part 105 and any cargo aft of these exits is restrained in accordance with paragraph 3.1.

4.2.1 Whenever an emergency exit is obstructed, the emergency exit sign for that exit shall be covered or otherwise made ineffective.

4.2.1 Whenever an emergency exit is obstructed, the emergency exit sign for that exit shall be covered or otherwise made ineffective.

4.3 Cargo shall not obstruct an aisle in accordance with subsection 7 of section 20.16.3.

4.4 Where cargo is carried in an aircraft (other than a single pilot aircraft) in which an aisle is not required by subsection 7 of section 20.16.3, the cargo shall be stowed:

(a) so as to ensure that crew members are able to move freely through the aircraft in a substantially upright position; or

(b) so as to provide access through the aircraft for the crew members in such other manner as may be approved by CASA.

5 CARGO ON A PASSENGER SEAT

5.1 Cargo may be carried on an unoccupied passenger seat. The weight of such cargo shall be evenly distributed over the squab, and shall not exceed 77 kg, except where a seat loading scheme permitting a greater weight is specifically approved by CASA.

5.2 Cargo carried on a passenger seat shall be restrained in accordance with the requirements of paragraph 3.

6 CARGO IN PILOT COMPARTMENT

6.1 Carriage of cargo in pilot compartments is prohibited except that in aircraft having a maximum take-off weight not more than 5 700 kg, cargo may be carried on an unoccupied control seat.

6.2 Cargo carried on a control seat shall not exceed 77 kg in weight unless a seat loading scheme which would permit a greater weight is specifically approved by CASA.

6.3 Cargo shall not be carried on a control seat if the cargo or means of restraint would interfere with the operation of the aircraft.

6.3.1 When cargo is carried on a control seat, the flight controls relevant to that seat shall be removed where they have been designed for easy removal and the remaining fittings protected so as to prevent interference by the cargo to the operation of the aircraft.

6.4 Cargo carried on a control seat shall be restrained in accordance with the requirements of subsection 3.

7 PLACARDING

Cargo shall only be carried in a place or compartment placarded with loading instructions.

Australian Government

Civil Aviation Safety Authority

Civil Aviation Order 20.16.3 (as amended)

made under regulations 208 and 235 of the *Civil Aviation Regulations 1988*.

This compilation was prepared on 27 July 2021 taking into account amendments up to *Civil Aviation Order 20.16.3 Amendment Instrument 2021 (No. 1)*.

Prepared by the Advisory & Drafting Branch, Legal, International & Regulatory Affairs Division, Civil Aviation Safety Authority, Canberra.

Compilation No. 4

Contents

Air service operations — carriage of persons

Section 20.16.3

Air service operations — carriage of persons

1 Application

This section applies to all Australian registered aircraft.

2 Definitions

In this section, unless a contrary intention appears:

An ***aisle*** is a longitudinal passageway between seats.

A ***cabin attendant*** is a crew member, other than a flight crew member, who is qualified in the execution of emergency procedures in accordance with the requirements of section 20.11.

A ***child*** is a passenger who has reached his or her third but not his or her thirteenth birthday.

An ***infant*** is a passenger who has not reached his or her third birthday.

A ***passenger*** is a person who is not a crew member.

3 Seats

3.1 Each crew member and each passenger shall occupy a seat of an approved type:

(a) during take-off and landing; and

(b) during an instrument approach; and

(c) when the aircraft is flying at a height less than 1000 feet above the terrain; and

(d) in turbulent conditions:

except:

(i) infants, children and stretcher cases carried in accordance with subsections 13 and 14 respectively; and

(ii) package dispatchers carried in accordance with section 29.5; and

(iii) parachutists carried in accordance with subsection 15.

3.2 Each crew member and passenger shall occupy a seat of an approved type during agricultural operations and during acrobatic manoeuvres.

3.3 The operator of the aircraft must ensure that exit rows in the aircraft are occupied only by persons who are, subject to subsection 14, fully able and willing to assist with access to the emergency exits in the event of an emergency.

4 Seat belts and safety harnesses

4.1 Except as provided in subsections 14 and 15 safety harnesses, or seat belts where safety harnesses are not fitted, shall be worn by all persons at the times listed in paragraph 3.1. Seat belts and safety harnesses shall be adjusted to fit the wearer without slack.

4.2 At least 1 pilot crew member shall wear a seat belt or harness at all times during flight.

4.3 When a cabin attendant is not required to be carried in an aircraft, and the passenger seating capacity is 10 seats or more, an approved and serviceable electronic public address system shall be provided to enable the pilot in command to notify passengers when a seat belt or safety harness is to be worn.

5 Adjustment of seats

5.1 All seats (with the exception of those specified in paragraph 5.2) shall be adjusted to their upright position for take-off and landing.

5.2 When it is desirable through illness or other incapacity that a passenger's seat remains in the reclined position during take-off or landing, that seat,

notwithstanding the provision of paragraph 5.1, may be left reclined during take-off or landing if it is forward facing, there is no person occupying the seat immediately behind, and it will not impede the egress of any person in an emergency evacuation.

6 Cabin attendants

6.1 Subject to subsection 6A, aircraft engaged in charter or regular public transport operations shall carry cabin attendants appropriate to their passenger complement as follows:

(a) aircraft carrying more than 15 but not more than 36 passengers shall carry a cabin attendant, except that aircraft:

(i) carrying not more than 22 passengers, at least 3 of whom are infants or children; and

(ii) crewed by 2 pilots;

need not carry a cabin attendant if the duties and responsibilities of the flight crew concerning the briefing and control of passengers in normal and emergency operations are specified in the operations manual;

(b) aircraft carrying more than 36 but not more than 216 passengers shall carry at least 1 cabin attendant for each unit of 36 passengers or part thereof;

(c) aircraft carrying more than 216 passengers shall carry the number of cabin attendants as prescribed by CASA which shall not be less than 1 cabin attendant for each floor level exit in any cabin with 2 aisles;

(d) notwithstanding the specifications of (a), (b) and (c) above, in an aircraft in which cabin attendants are required to be carried, there shall be not less than 1 cabin attendant in each separate compartment occupied by passengers, and, where the number of cabin attendants used in the emergency evacuation demonstration required by section 20.11 was in excess of the numbers required by (a), (b) or (c) above, the number of cabin attendants on an aircraft shall be not less than the numbers required by (a), (b) or (c) as applicable plus the excess number of attendants used in the demonstration.

6.2 When cabin attendants must be carried in accordance with paragraph 6.1, the number of cabin attendants need not be increased when infants or children are carried and the total number of passengers exceeds that permitted by the number of cabin attendants provided that:

(a) the number of excess passengers does not exceed 5% (to the next highest whole number); and

(b) the excess passengers are infants or children.

6.3 When parachutists are carried on aircraft engaged in parachuting operations they shall not be regarded as passengers for the purpose of determining the number of cabin attendants required.

6A Manned balloons and hot air airships

A manned balloon or hot air airship engaged in charter operations need not carry a cabin attendant if:

(a) the operator's operations manual (the ***manual***) mentions the duties and responsibilities of the pilot in command for the briefing and control of passengers in normal and emergency situations; and

(b) for a manned balloon or hot air airship that has more that 2 passenger compartments — the pilot in command has a separate compartment centrally located among the passenger compartments; and

(c) during the operations:

(i) the number of passengers does not exceed 24; and

(ii) an approximately equal weight of passengers is located in each of the passenger compartments; and

(iii) not more than 6 passengers are located in each passenger compartment; and

(iv) the passengers are always in a position to hear any instructions given by the pilot in command; and

(d) during passenger loading and launching operations, and as far as possible during landing and passenger unloading operations, at least the following are available to help the pilot with loading or unloading passengers:

(i) if not more than 16 passengers are carried — 1 ground crew member trained in accordance with the manual (a ***trained ground crew member***); and

(ii) if more than 16 passengers are carried — 2 trained ground crew members, with 1 at either end of the basket or as directed by the pilot in command of the balloon; and

(e) the manual contains a detailed statement of ground crew training and duties, including a system to record for each trained ground crew member when and how he or she successfully completed training; and

(f) the operations are conducted in accordance with all other relevant requirements of this Order.

Note Subject to compliance with certain conditions, Civil Aviation Order 95.53 exempts a manned balloon or hot air airship, engaged in aerial work or charter operations, from the requirements of regulation 251 of the *Civil Aviation Regulations 1988* concerning seat belts and safety harnesses. Therefore, subsections 3, 4, 7 and 15 of Civil Aviation Order 20.16.3 do not apply to such a manned balloon or hot air airship.

7 Aisles

7.1 An aircraft which is engaged in charter or regular public transport operations and which is required by subsection 6 to carry 1 or more cabin attendants shall be provided with an aisle, which shall at all times enable the cabin attendants to have unobstructed passage through the compartment from front to rear.

7.2 An aircraft which is engaged in charter or regular public transport operations and which:

(a) carries 15 passengers or fewer; or

(b) satisfies the requirements of subparagraph 6.1 (a)

need not be provided with an aisle, provided that the relevant requirements of section 20.11 can be complied with.

8 Smoking

Pursuant to paragraph 255 (2) (a) of the *Civil Aviation Regulations* 1988, a notice(s) specifying the periods during which smoking is prohibited may be permanently displayed in the crew compartment and toilets of all aircraft and in the passenger compartment of aircraft which have only 1 passenger compartment and a maximum take-off weight of 5 700 kg or less.

9 Stowage of loose articles

9.1 Loose articles in the cabin of an aircraft, including items of equipment and crew members and passengers' personal effects, shall be stowed so as to avoid the possibility of injury to persons or damage to the aircraft through the movement of such articles caused by in-flight turbulence or by unusual accelerations or manoeuvres.

9.2 Except as provided for in paragraph 4.2 of section 20.16.2 all aisles, passageways and exits shall be kept clear of obstructions when the aircraft has passengers on board and is in flight below 1 000 feet above terrain or, except when embarking or disembarking passengers, is on the ground.

9.3 All solid articles shall be placed in approved stowage at all times when seat belts are required to be worn in accordance with paragraph 4.1.

9.4 Approved stowage for solid articles means:

(a) under a passenger seat, where the stowage compartment has an approved means of preventing solid articles from shifting forwards; or

(b) in an overhead locker in accordance with the design weight limitation of the locker; or

(c) in any other locker or rack, excluding overhead racks, which have been designed to contain solid articles in flight.

Note Underseat stowage compartments which comply with the forward restraint provisions of section 103.10 are approved for the purposes of this section.

10 Passenger service

Except when in use, all items provided for passenger service, such as food containers, vacuum flasks and serving trays, shall be carried in their respective stowages and secured against movement likely to cause injury to persons or damage to the aircraft. In any case, all such items shall be stowed during take-off and landing.

11 Carriage of passengers in seats at which dual controls are fitted

11.1 Except as provided in paragraph 11.2, in all aircraft for which the Certificate of Airworthiness specifies a minimum crew of 1 pilot, a person may occupy a seat at which fully or partially functioning dual controls are fitted if the pilot gives adequate instruction to that person to ensure that the controls are not interfered with in flight and there is satisfactory communication available at all times between the pilot and that person.

11.2 In respect of aircraft engaged in regular public transport operations, the seat referred to in paragraph 11.1 shall not be occupied by a person other than a licensed pilot or an employee of the operator of the aircraft unless approved by CASA. Details of such an approval shall be included in the Operations Manual.

11.3 The provisions of these paragraphs shall not be construed as limiting the exercise of the authority of CASA in accordance with regulation 226 of the *Civil Aviation Regulations 1988*.

12 Passenger capacity

12.1 The number of passengers carried in an aircraft for which an emergency evacuation demonstration is required by subsection 15 of section 20.11 shall not exceed the number demonstrated or the number otherwise approved by CASA, except that when infants are carried the number may be increased by 5% (to the nearest whole number), provided the excess passengers are infants.

12.2 The number of passengers carried in an aircraft for which an emergency evacuation demonstration is not required may exceed the number of approved passenger seats fitted in the aircraft only if the excess number of passengers:

(a) has been approved by CASA; or

(b) does not exceed the number specified in column 2 of the following table opposite the number of passenger seats specified in column 1;

and the excess passengers are infants or children:

Table

Column 1 **No. of passenger seats**	**Column 2** **No. of excess passengers**
2-6	1
7-13	2
14-20	3
21-26	4
27-39	5
40-44	6

13 Carriage of infants and children

13.1 Where their combined weight does not exceed 77 kg, 2 children may occupy 1 seat if:

(a) seated side by side; and

(b) restrained by a lapstrap only; and

(c) the seat-belt is adjusted to secure both children at all times when a seat belt is required to be worn.

13.2 (1) An infant may be carried in the arms or on the lap of an adult passenger, in a bassinet or in an infant seat in accordance with paragraphs 13.3, 13.4, 13.5 and 13.6 providing the bassinet or infant seat is restrained so as to prevent it from moving under the maximum accelerations to be expected

in flight and in an emergency alighting, and precautions are taken to ensure that, at the times seat belts are required to be worn, the infant will not be thrown from the bassinet or infant seat under these accelerations.

(2) When an infant is carried in the arms or on the lap of a passenger in accordance with subparagraph 13.2 (1) the seat belt, when required to be worn, shall be fastened around the passengers carrying or nursing the infant, but not around the infant.

(3) When an infant is carried in the arms or on the lap of a passenger in accordance with subparagraph 13.2 (1) on an aircraft engaged in charter or regular public transport operations, the name of the infant shall be bracketed on the passenger list with the name of the person carrying or nursing the infant.

(4) An infant must not be carried in an exit seat during take-off or landing unless the pilot in command is satisfied that the infant's presence in the seat will not obstruct or hinder the escape of other persons from the aircraft.

(5) In subparagraph (4), ***exit seat*** means a seat that is in a row of seats adjoining an exit.

13.3 An infant seat, being a seat designed for the seating and restraint of infants, must not be used on an aircraft unless CASA or a recognised authority has approved the seat in writing as being of a type that is suitable for use by infants in an aircraft.

13.4 In paragraph 13.3, ***recognised authority*** means the Civil Aviation Authority of the United Kingdom, the Federal Aviation Administration of the United States of America or the authority of another country that is responsible for the safety of air navigation and that CASA declares in writing to be a recognised authority for the purposes of paragraph 13.3.

13.5 An infant seat must not be used on an aircraft:

(a) if it is secured to a side-facing seat; or

(b) unless it is secured at all times during the flight, by means of a seat belt or as otherwise approved, to a seat ordinarily used by an adult passenger.

13.6 The use of an infant seat on an aircraft is subject to such conditions (if any) of which CASA notifies the operator of the aircraft in writing.

14 Persons or passengers who require assistance due to sickness, injury or disability

14.1 The operator of an aircraft must, as much as possible, identify any person on the aircraft who requires assistance due to sickness, injury or disability.

14.2 Subject to paragraph 14.5, the operator and pilot in command of an aircraft must ensure that any person who requires assistance due to sickness, injury or disability is not seated where he or she could obstruct or hinder access to any emergency exits.

14.3 If a person who requires assistance due to sickness, injury or disability is carried on an aircraft, the operator and pilot in command must:

(a) take all reasonable precautions to prevent hazards to other persons on the aircraft; and

(b) ensure that there are procedures in place to enable particular attention to be given to any such passenger in an emergency; and

(c) ensure that individual briefings on emergency procedures are given to any such person in accordance with Civil Aviation Order 20.11.

14.4 The carriage of stretcher patients on any aircraft must be in accordance with the following requirements:

(a) the stretcher must be secured in the aircraft so as to prevent it from moving under the maximum acceleration likely to be experienced in flight and in an emergency alighting such as ditching;

(b) the patient must be secured by an approved harness to the stretcher or aircraft structure.

Note Psychiatric restraint equipment is not an approved harness for this purpose.

14.5 Paragraph 14.2 does not apply in relation to a rotorcraft or a smaller aeroplane if:

(a) the person who requires assistance is accompanied, or assisted, for the flight by a suitable person who is seated adjacent to the emergency exit; and

(b) the suitable person is accompanying or assisting only that person for the flight; and

(c) the suitable person has agreed to assist the crew with the evacuation of the aircraft in an emergency.

14.6 For the purposes of paragraph 14.5:

rotorcraft means:

(a) a helicopter; or

(b) a gyroplane; or

(c) a powered-lift aircraft.

smaller aeroplane means an aeroplane that has:

(a) a maximum passenger seating capacity of not more than 9; and

(b) a maximum take-off weight of not more than 8 618 kg.

suitable person: a person is a ***suitable person*** if the person:

(a) is reasonably fit, strong, and able to assist with the rapid evacuation of the aircraft in an emergency; and

(b) would not, because of a condition or disability, including an inability to understand oral instructions, hinder:

(i) other passengers during an evacuation of the aircraft in an emergency; or

(ii) the aircraft's crew in carrying out their duties in an emergency.

15 Carriage of parachutists

15.1 Where a parachutist is not provided with a seat of an approved type, he or she shall be provided with a position where he or she can be safely seated.

15.2 During the times specified in paragraph 3.1, he or she shall, except when he or she is about to jump:

(a) occupy a seat or a seating position;

(b) wear, adjusted to ensure adequate restraint;

(i) a seat belt; or

(ii) a safety harness; or

(iii) a parachute connected to an approved single point restraint.

Notes to Civil Aviation Order 20.16.3

Note 1

The Civil Aviation Order (in force under the *Civil Aviation Regulations 1988*) as shown in this compilation comprises Civil Aviation Order 20.16.3 amended as indicated in the Tables below.

Table of Orders

Year and number	Date of notification in *Gazette*/ registration on FRLI	Date of commencement	Application, saving or transitional provisions
CAO 2004 No. R17	8 December 2004	8 December 2004 (*see* s. 2)	
CAO 20.16.3 2006 No. 1	FRLI 30 June 2006	1 July 2006 (*see* s. 2)	
CAO 20.16.3 2006 No. 2	FRLI 17 October 2006	18 October 2006 (*see* s. 2)	
CAO 20.16.3 2009 No. 1	FRLI 31 July 2009	1 August 2009 (*see* s. 2)	
CAO 20.16.3 2021 No. 1	26 July 2021 (F2021L01026)	27 July 2021 (*see* s. 2)	

Table of Amendments

ad. = added or inserted am. = amended rep. = repealed rs. = repealed and substituted

Provision affected	How affected
s. 20.16.3	rs. CAO 2004 No. R17
subs. 2	am. CAO 20.16.3 2006 No. 1, CAO 20.16.3 2009 No. 1
subs. 3	am. CAO 20.16.3 2009 No. 1, CAO 20.16.3 2021 No. 1
subs. 4	am. CAO 20.16.3 2009 No. 1
subs. 6	am. CAO 20.16.3 2006 No. 1
subs. 6A	ad. CAO 20.16.3 2006 No. 1
	am. CAO 20.16.3 2006 No. 2, CAO 20.16.3 2009 No. 1
subs. 14	rs. CAO 20.16.3 2009 No. 1
	am. CAO 20.16.3 2021 No. 1
subs. 15	rep. CAO 20.16.3 2009 No. 1
subs. 16	am. CAO 20.16.3 2009 No. 1

Civil Aviation Order 20.18 (Aircraft equipment — basic operational requirements) Instrument 2014 (as *amended*)

made under regulations 207 and 232A of the *Civil Aviation Regulations 1988* and subsection 33 (3) of the *Acts Interpretation Act 1901*.

This compilation was prepared on 15 June 2020 taking into account amendments up to *Civil Aviation Order 20.18 Amendment Instrument 2020 (No. 1)*. It is a compilation of the *Civil Aviation Order 20.18 (Aircraft equipment — basic operational requirements) Instrument 2014* as amended and in force on 11 June 2020.

Prepared by the Advisory and Drafting Branch, Legal, International & Regulatory Affairs Division, Civil Aviation Safety Authority, Canberra.

Compilation No. 5.

1A Name of instrument

1A.1 This instrument is the *Civil Aviation Order 20.18* (*Aircraft equipment — basic operational requirements) Instrument 2014*.

1A.2 This instrument may be cited as *Civil Aviation Order 20.18*.

1A.3 A reference in an instrument to section 20.18 of the Civil Aviation Orders is taken to be a reference to this instrument.

1 Application

This Order applies to all Australian registered aircraft.

Note Particular attention is drawn to the fact that this Order does not include requirements for oxygen equipment, radio apparatus or emergency equipment which are specified in Civil Aviation Orders 20.4 and 20.11, respectively.

2 Definitions

2.1 In this Order, unless a contrary intention appears:

aerial work includes flight training conducted by a Part 141 operator or a Part 142 operator.

CAR 1988 means the *Civil Aviation Regulations 1988*.

CASR 1998 means the *Civil Aviation Safety Regulations 1998*.

minimum equipment list means a list that provides for the operation of aircraft with permissible unserviceabilities, subject to compliance with such conditions, if any, as CASA directs under subregulation 37 (2) of CAR 1988.

permissible unserviceability means any defect or damage that CASA has approved under subregulation 37 (1) of CAR 1988 as a permissible unserviceability.

TAWS-B+ system means a terrain awareness and warning system that is equipped with a visual display and complies with the requirements for Class B equipment expressed in (E)TSO-C151, (E)TSO-C151a or (E)TSO-C151b.

2.2 In this Order, a reference to an (E)TSO, a TSO or an ETSO, as defined in subsections 9B and 9D, with an empty bracket at the end of the reference, includes the (E)TSO, TSO or ETSO in a version that contains a number within the bracket.

3 Instrumentation for flight under the Visual Flight Rules (the V.F.R.)

RPT aeroplanes and large charter aeroplanes

3.1 An aeroplane engaged in:

(a) a regular public transport (***RPT***) operation; or

(b) a charter operation that has maximum take-off weight exceeding 5 700 kg — a charter operation;

may only be operated under the V.F.R. if it is equipped with the following:

(c) the instruments specified in Appendix II;

(d) any other instruments and indicators specified in the aeroplane's flight manual.

Note ***V.F.R.*** and ***flight manual*** are defined in subregulation 2 (1) of CAR 1988.

Helicopters

3.2 Subject to paragraph 3A.1, a helicopter may only be operated under the V.F.R. by day if it is equipped with the following:

(a) the instruments specified in Appendix VI;

(b) any other instruments and indicators specified in the helicopter's flight manual.

3.2A A helicopter may only be operated under the V.F.R. at night if:

(a) it is equipped with the instruments specified in Appendix VIII; and

(b) it is equipped with any other instruments and indicators specified in the helicopter's flight manual;

(c) for flights under V.F.R. at night which involve flights over land or water where the helicopter's attitude cannot be maintained by the use of visual external surface cues as a result of lights on the ground or celestial illumination:

(i) the helicopter is equipped in accordance with subparagraph 4.2 (d) of this Order; or

(ii) the helicopter is operated by a qualified 2 pilot crew, each with access to flight controls.

Hot air balloons and hot air airships

3.3 Subject to paragraph 3A.2, a hot air balloon and a hot air airship may only be operated under the V.F.R. if the balloon or airship is equipped with the following:

(a) the instruments specified in Appendix X;

(b) any other instruments and indicators specified in the flight manual of the balloon or airship.

Other aircraft in private, aerial work or charter operations

3.4 Subject to paragraph 3A.3, an aircraft:

(a) engaged in a private, aerial work or charter operation; and

(b) not mentioned in paragraphs 3.1 to 3.3;

may only be operated under the V.F.R. if it is equipped with the following:

(c) the instruments specified in Appendix I;

(d) any other instruments and indicators specified in the aircraft's flight manual.

3A Operations to which flight and navigation equipment requirements do not apply

3A.1 Paragraph 3.2 does not apply to a helicopter that operates under the V.F.R., and for which an experimental certificate has been issued under paragraph 21.191 (g) or (h) of CASR 1998, if equipment is carried that provides a pilot with the same information that would be obtained by compliance with the requirements of Appendix VI for operations by day, or Appendix VIII if approved for operations by night.

3A.2 Paragraph 3.3 does not apply to a balloon that operates by day under the V.F.R.:

(a) being an aircraft for which a current certificate of airworthiness as a light sport aircraft (***LSA***) has been issued; or

(b) being an aircraft for which an experimental certificate has been issued under paragraph 21.191 (g), (h) or (j), or an LSA for which an experimental certificate has been issued under paragraph 21.191 (k), of CASR 1998;

if equipment is carried that provides a pilot with the same information that would be obtained by compliance with the requirements of Appendix X.

3A.3 Paragraph 3.4 does not apply to any other aircraft that operates under the V.F.R.:

(a) being an aircraft for which a current certificate of airworthiness as an LSA has been issued; or

(b) being an aircraft for which an experimental certificate has been issued under paragraph 21.191 (g), (h) or (j) or an LSA for which an experimental certificate has been issued under paragraph 21.191 (k), of CASR 1998;

if equipment is carried that provides a pilot with the same information that would be obtained by compliance with the requirements of Appendix I for operations by day, or Appendix IV if approved for operations by night.

3A.4 An aircraft referred to in paragraphs 3A.1 to 3A.3 that is approved to operate at night and is equipped with an Electronic Flight Information System (***EFIS***), or other means of electronically displaying the required information, must be provided with a battery-powered back-up, or another form of instrumentation independent of the aircraft electrical system, that is approved by an authorised person as suitable, in the case of a failure of the aircraft electrical system, for the purpose of enabling the pilot to divert to and use a safe landing site.

3A.5 If an aircraft equipped as required under paragraph 3A.4 has a battery-powered back-up to an EFIS, the back-up must be of sufficient capacity to power the EFIS panel or other display for 90 minutes and must be fully charged before the commencement of a flight at night.

3A.6 Subject to paragraph 3A.7, an Australian registered aircraft may be operated without compliance with the flight and navigation equipment requirements in subsections 3 and 4 of this Order if it can show compliance with an equivalent level of safety, as determined by the type certificating authority for the aircraft, taking into consideration its intended operation.

3A.7 The type certificating authority for the aircraft must be a recognised authority.

3A.8 In paragraph 3A.7:

recognised authority means an authority of a country listed in regulation 21.012 of CASR 1998.

4 Equipment for flight under the Instrument Flight Rules (the *I.F.R.*)

4.1 Subject to subsection 3A, an aeroplane must not be operated under the I.F.R. unless it is equipped with:

(a) the flight and navigation instruments specified in Appendixes II, III and IV to this Order, as applicable; and

(b) any other instruments or indicators specified in the aeroplane flight manual; and

(c) the minimum lighting equipment specified in Appendix V to this Order; and

(e) in the case of single pilot RPT operations, earphones for the pilot with boom or throat microphone and a press to transmit control on the control column. The earphones and microphone must be compatible with the radio installation in the aeroplane and must be used by the pilot during flight.

4.1A Subject to paragraphs 4.1B and 4.1C, an aeroplane engaged:

(a) in RPT operations; or

(b) in charter operations; or

(c) in aerial work operations as an air ambulance or for a flying doctor service;

must not be operated under the I.F.R. unless it is equipped with a serviceable automatic pilot approved by CASA that has the following capabilities:

(d) a capability of operating the flight controls to maintain flight and manoeuvre the aeroplane about the roll and pitch axis;

(e) an automatic heading capability;

(f) an altitude hold capability.

Note For the purpose of meeting the requirements of subparagraph 4.1A (d), an automatic pilot is taken to have the capability of manoeuvring the aeroplane about the pitch axis if it does so solely to restore the selected altitude after a disturbance.

4.1B In spite of paragraph 4.1A, an aeroplane referred to in that paragraph that is not equipped with an automatic pilot in accordance with that paragraph may be operated under the I.F.R., if the aeroplane:

(a) is equipped with fully functioning dual controls; and

(b) has 2 control seats, with 1 control seat occupied by the pilot in command of the aeroplane and the other by a pilot who is authorised under Part 61 of CASR 1998 to conduct the flight.

4.1C If the automatic pilot fitted to an aeroplane engaged:

(a) in charter operations; or

(b) in aerial work operations as an air ambulance or for a flying doctor service;

loses a capability referred to in paragraph 4.1A, the aeroplane may, if the pilot is satisfied that it is safe to do so, be operated under the I.F.R. by a single pilot at any time within the period of 3 days commencing on the day on which the automatic pilot loses the capability.

4.1D Paragraphs 4.1A, 4.1B and 4.1C apply in addition to, and not in derogation of, paragraph 4.1.

4.2 Subject to subsection 3A, a helicopter must not be operated under the I.F.R. unless it is equipped with:

(a) the flight and navigation instruments specified in Appendixes VII, VIII or IX to this Order, as applicable; and

(b) any other instruments, indicators or equipment specified in the helicopter flight manual; and

(c) the minimum lighting equipment specified in Appendix V to this section; and

(d) an approved automatic pilot or automatic stabilisation system.

Note Because of considerable variation in the individual stability characteristics of different helicopter types and in the associated automatic pilot and automatic stabilisation systems approved by the certification authority in the country of certification, it is not possible to detail precise specifications for this equipment. This consideration also applies to the flight crew complement. Accordingly, each application for approval to conduct I.F.R. category operations will be individually assessed on the basis of the specific helicopter type and its associated automatic pilot or autostabilisation equipment and the proposed operating environment.

5 Windshield clear vision equipment

5.1 An aircraft with a flight compartment windshield may only be operated under the V.F.R. or the I.F.R. if it has a means of clearing heavy outside precipitation from the windshield at a rate which ensures an unobstructed view for each pilot.

Note ***I.F.R.*** is defined in subregulation 2 (1) of CAR 1988.

5.2 Paragraph 5.1 does not apply for:

(a) an aeroplane with an MTOW less than 5 700 kg; or

(b) a helicopter with an MTOW less than 2 750 kg maximum;

if the windshield design satisfies CASA that moderate rain will not impair the pilot's view for take-off, landing or normal flight.

6 Recording equipment

6.1 An aircraft of maximum take-off weight:

(a) in excess of 5 700 kg and which is:

(i) turbine-powered; or

(ii) of a type first certificated in its country of manufacture on or after 1 July 1965;

must not be flown (except in agricultural operations) unless it is equipped with an approved flight data recorder and an approved cockpit voice recorder system;

(b) less than, or equal to, 5 700 kg and which is:

(i) pressurised; and

(ii) turbine-powered by more than 1 engine; and

(iii) of a type certificated in its country of manufacture for operation with more than 11 places; and

(iv) issued with its initial Australian Certificate of airworthiness after 1 January 1988;

must not be flown unless it is equipped with an approved cockpit voice recorder system.

6.1A Paragraph 6.1 does not apply to an aircraft for which there is in force an airworthiness certificate in the agricultural category or the restricted category.

6.2 The flight data recorder and cockpit voice recorder systems installed in an aircraft under this Order:

(a) must comply with the requirements of Civil Aviation Orders 103.19 and 103.20, respectively; and

(b) will be considered for approval when CASA has equipment available allowing replay of the recordings.

6.3 Where an aircraft is required to be so equipped by this Order, the flight data recorder system must be operated continuously from the moment when the aircraft commences to taxi under its own power for the purpose of flight until the conclusion of taxiing after landing.

6.4 Where an aircraft is required to be so equipped by this Order, the cockpit voice recorder system must be operated continuously from the start of the use of the check list before starting engines for the purpose of flight until completion of the final check list at the termination of the flight.

6.5 Where an aircraft is required to be so equipped by this Order, the operator must ensure that:

(a) the flight data recorder retains its last 25 hours of recording; and

(b) the cockpit voice recorder retains its last 30 minutes of recording; and

(c) data from the last 2 occasions on which the flight data recorder system was calibrated from which the accuracy of the system can be determined are preserved.

6.6 The operator of an aircraft which is required by this Order to be equipped with recorders must take action to ensure that during ground maintenance periods the recorders are not activated unless the maintenance is associated with the flight data recording equipment or with the aircraft engines.

6.7 An aircraft required to be fitted with a flight data recorder system and/or a cockpit voice recorder system may operate with an unserviceable recorder system for a period of 21 days commencing on the day on which the system was determined to be unserviceable providing that:

(a) the aircraft does not depart from an aerodrome where staff and equipment are available to replace the unserviceable units; and

(b) where the aircraft is required to be fitted with both a flight data recorder and cockpit voice recorder system, 1 system is serviceable; and

(c) the aircraft is not operating training or test flights.

7 Assigned altitude indicator and altitude alerting system

7.1 Piston-engined aircraft and unpressurised turbine-engined aircraft operating above 15 000 feet in controlled airspace under the I.F.R. (except night V.M.C.) must be equipped with an altitude alerting system.

7.2 Pressurised turbine-engined aircraft operating in controlled airspace under the I.F.R. (except night V.M.C.) must be equipped with an altitude alerting system.

7.3 Unless equipped with an altitude alerting system, an aircraft operating in controlled airspace under the I.F.R. (except night V.M.C.) must be equipped with an assigned altitude indicator.

7.4 An altitude alerting system or an assigned altitude indicator must be so designed and located that:

(a) it can be readily adjusted for setting from each pilot seat; and

(b) the assigned altitude/flight level display is clearly discernible by day and night to all operating flight crew members whose duties involve altitude/flight level assignment monitoring; and

(c) altitude/flight levels may be pre-selected unambiguously in increments commensurate with levels at which the aircraft may be operated.

7.5 The assigned altitude indicator must be demonstrated to the satisfaction of CASA.

7.6 The altitude alerting system must be demonstrated to the satisfaction of CASA and be capable of:

(a) alerting the pilot upon approaching or departing from a pre-selected level in both climb and descent by aural and/or visual signals in sufficient time to establish level flight at the pre-selected level, except that altitude alerting systems in aircraft first registered in Australia before 1 January 1983 need not alert the pilot when departing from a pre-selected altitude; and

(b) providing the required signals from sea level to the highest operating altitude approved for the aircraft in which it is installed; and

(c) being tested without separate equipment to determine proper operation of the alerting signals; and

(d) accepting necessary barometric pressure settings in millibars if the system or device operates on barometric pressure.

8 Radiation indicator

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

9 Ground proximity warning system

9.1C A turbine-engined aeroplane that:

(a) has a maximum take-off weight of more than 15 000 kg or is carrying 10 or more passengers; and

(b) is engaged in RPT, or charter, operations;

must not be operated under the I.F.R. unless it is fitted with:

(c) an approved GPWS that has a predictive terrain hazard warning function; or

(d) if paragraph 9.1CA applies — a GPWS that meets the requirements of Civil Aviation Order 108.36 (a **CAO 108.36 GPWS**); or

(e) if the aeroplane has a maximum take-off weight of 5 700 kg or less, but is carrying 10 or more passengers — a TAWS-B+ system.

9.1CA Up to the end of June 2005, an aeroplane may be fitted with a CAO 108.36 GPWS:

(a) if, immediately before 1 January 2001, paragraph 9.1 applied to the aeroplane; or

(b) if the aeroplane first becomes an Australian aeroplane on or after 1 January 2001 (unless it is an aircraft in respect of which an undertaking has been given under paragraph 5.3 of Civil Aviation Order 82.1 or paragraph 10.3 of Civil Aviation Order 82.3 or 82.5, as in force immediately before 1 January 2001); or

(c) if:

(i) immediately before 1 January 2001, paragraph 9.1 did not apply to the aeroplane because of paragraph 9.1A; and

(ii) the holder of the AOC authorising the operation of the aeroplane (the AOC holder) provides satisfactory evidence to CASA, in accordance with paragraph 9.1CB, that it is not possible to fit the aeroplane with an approved GPWS that has a predictive terrain hazard warning function.

9.1CB For the purposes of sub-subparagraph 9.1CA (c) (ii), evidence is taken to be satisfactory only if it is:

(a) a statement, in writing, to the AOC holder from the manufacturer of an approved GPWS that has a predictive terrain hazard warning function; or

(b) a statutory declaration by the AOC holder;

to the effect that the FAA's list of supplemental type certificates does not include any reference to a supplemental type certificate relating to the fitting of an aeroplane of the same type with an approved GPWS that has that function.

9.1D For the purposes of this subsection:

(a) a GPWS has a ***predictive terrain hazard warning function*** if it employs an aircraft navigation system and a terrain database to compute a display of terrain along, and in the vicinity of, the flight path of an airborne aeroplane in order to provide the flight crew of the aeroplane with a warning of any terrain that may endanger the aeroplane if its flight path were to remain unchanged; and

(b) the GPWS is taken to be approved only if it meets:

(i) the requirements set out in FAA notice N 8110.64 as in force on 15 August 1999; or

(ii) the standard for the Class A Terrain Awareness Warning System specified in TSO C-151, TSO C-151a or TSO C-151b.

9.2 A GPWS must be demonstrated to the satisfaction of CASA to be capable of providing automatically a timely and distinctive warning to the flight crew when the aeroplane is in potentially hazardous proximity to the earth's surface.

9.3 Except as provided in paragraph 9.4, an aeroplane required to be fitted with a GPWS must not commence a flight with that equipment unserviceable.

9.4 An aeroplane required to be fitted with a GPWS must not depart with that equipment unserviceable from an aerodrome where facilities are available to repair or replace the GPWS and in no case must an aeroplane be operated with its GPWS unserviceable for a period exceeding 24 hours from the time the equipment was determined to be unserviceable.

9B Directions relating to carriage and use of automatic dependent surveillance – broadcast equipment

9B.1 This subsection applies to aircraft engaged in private, aerial work, charter or RPT operations in Australian territory.

9B.2 In subsections 9B, 9BA, 9C and 9E, and in Appendices XI, XII, XIII and XIV:

14 CFR 91.225 means regulation 91.225 of the United States Title 14 Code of Federal Regulations (CFR) titled *Automatic Dependent Surveillance-Broadcast (ADS-B) Out equipment and use,* as in force from time to time.

ADS-B means automatic dependent surveillance – broadcast.

ADS-B test flight means a flight to prove ADS-B transmitting equipment that is newly installed on the aircraft undertaking the flight.

aircraft address means a unique code of 24 binary bits assigned to an aircraft by:

(a) CASA when the aircraft is registered on the Australian Civil Aircraft Register; or

(b) the relevant RAAO for the aircraft when the aircraft is placed on its aircraft register.

AMSL means above mean sea level.

approved equipment configuration for ADS-B transmitting equipment means an equipment configuration that:

(a) meets the conditions for approval set out in Appendix XI, XII, XIII or XIV, as applicable under the Application provisions of the Appendix; or

(b) is approved in writing by CASA.

ATC means air traffic control.

CASR means the *Civil Aviation Safety Regulations 1998.*

certain light sport, experimental and other aircraft means any of the following:

(a) a light sport aircraft for which a special certificate of airworthiness has been issued and is in force under regulation 21.186 of CASR;

(b) a light sport aircraft for which an experimental certificate has been issued and is in force under paragraph 21.191 (j) or (k) of CASR;

(c) any other aircraft for which an experimental certificate has been issued and is in force under paragraph 21.191 (g) or (h) of CASR;

(d) an aircraft for which an experimental certificate has been issued and is in force under subregulation 21.190 (1) of CASR;

(e) an aircraft to which any of the following Civil Aviation Orders (CAOs) applies: CAO 95.4, 95.4.1, 95.8, 95.10, 95.12, 95.12.1, 95.32, 95.53, 95.54 or 95.55;

(f) a Part 103 aircraft within the meaning of regulation 103.005 of CASR.

Note Part 103 of CASR commences on 25 March 2021 (see regulation 2 of the *Civil Aviation Legislation Amendment (Parts 103, 105 and 131) Regulations 2019)*. Paragraph (f) is permitted by subsection 98 (5D) of the *Civil Aviation Act 1998*.

Class A TABS means TABS functionality relating to transponder function, altitude source function, and ADS-B OUT function, in accordance with (E)TSO-C199, as in force from time to time.

Class B TABS means TABS functionality relating to position source function, in accordance with (E)TSO-C199, as in force from time to time.

Class B TABS position source device means a device with a Class B TABS functionality.

EASA means the European Aviation Safety Agency.

EASA AMC 20-24 means Annex II to ED Decision 2008/004/R titled *Certification Considerations for the Enhanced ATS in Non-Radar Areas using ADS-B Surveillance (ADS-B-NRA) Application via 1090 MHz Extended Squitter*, dated 2 May 2008, of EASA, or a later version as in force from time to time.

EASA CS-ACNS means Annex I to ED Decision 2013/031/R *titled Certification Specifications and Acceptable Means of Compliance for Airborne Communications, Navigation and Surveillance CS-ACNS*, dated 17 December 2013, or a later version as in force from time to time.

EHS DAPs means enhanced surveillance downlink of aircraft parameters.

(E)TSO means FAA Technical Standard Order and/or European Technical Standard Order.

ETSO means European Technical Standard Order of the EASA.

FAA means the Federal Aviation Administration of the United States.

FDE means Fault Detection and Exclusion, a feature of a GNSS receiver that excludes faulty satellites from position computation.

FL 290 means flight level 290.

Note Flight level 290 is defined in subregulation 2 (1) of CAR 1988.

GNSS means the Global Navigation Satellite System installed in an aircraft to continually compute the position of the aircraft by use of the GPS.

GPS means the Global Positioning System.

HPL means the Horizontal Protection Level of the GNSS position of an aircraft as an output of the GNSS receiver or system.

IFR has the same meaning as I.F.R. and stands for instrument flight rules.

integrated TABS device means a device with integrated Class A TABS and Class B TABS functionality.

Mode A is a transponder function that transmits a 4-digit octal identification code for an aircraft when interrogated by an SSR, the code having been assigned to the aircraft by ATC for the relevant flight sector.

Mode A code is the 4-digit octal identification code transmitted by a Mode A transponder function.

Mode C is a transponder function that transmits a 4-digit octal code for an aircraft's pressure altitude when interrogated by an SSR.

Mode C code is the 4-digit octal identification code transmitted by a Mode C transponder function.

Mode S is a monopulse radar interrogation technique that improves the accuracy of the azimuth and range information of an aircraft, and uses a unique aircraft address to selectively call individual aircraft.

NAA has the same meaning as in regulation 1.4 of CASR 1998.

Note "***NAA***, for a country other than Australia, means:

(a) the national airworthiness authority of the country; or

(b) EASA, in relation to any function or task that EASA carries out on behalf of the country.".

NACp means Navigation Accuracy Category for Position as specified in paragraph 2.2.3.2.7.1.3.8 of RTCA/DO-260B.

NIC means Navigation Integrity Category as specified in paragraph 2.2.3.2.3.3 of RTCA/DO-260B.

NUCp means Navigation Uncertainty Category – Position as specified in paragraph 2.2.8.1.5 of RTCA/DO-260.

RAAO means a recreational aviation administration organisation that is recognised by CASA.

RTCA/DO-229D means document RTCA/DO-229D titled *Minimum Operational Performance Standards for Global Positioning System/Wide Area Augmentation System Airborne Equipment*, dated 13 December 2006, of the RTCA Inc. of Washington D.C. USA (***RTCA Inc.***).

RTCA/DO-260 means RTCA Inc. document RTCA/DO-260 titled *Minimum Operational Performance Standards for 1090 MHz Automatic Dependent Surveillance – Broadcast*, dated 13 September 2000.

RTCA/DO-260B means RTCA Inc. document RTCA DO-260B titled *Minimum Operational Performance Standards for 1090 MHz Extended Squitter Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services – Broadcast (TIS-B),* dated 2 December 2009, unless a later version as in force from time to time is expressly referred to.

SA means Selective Availability, and is a function of the GPS that has the effect of degrading the accuracy of the computed GPS position of a GNSS-equipped aircraft.

SDA means System Design Assurance as specified in section 2.2.3.2.7.2.4.6 of RTCA/DO-260B.

SIL means Source Integrity Level as specified in paragraph 2.2.3.2.7.1.3.10 of RTCA/DO-260B.

SSR means a secondary surveillance radar system that is used by ATC to detect an aircraft equipped with a radar transponder.

TABS means traffic awareness beacon system.

TSO means Technical Standard Order of the FAA.

UK CAP 1391 means Civil Aviation Authority of the United Kingdom document number CAP 1391 titled *Electronic conspicuity devices*, 2nd edition, dated April 2018, or a later edition as in force from time to time.

VFR has the same meaning as V.F.R. and stands for visual flight rules.

9B.3 Subject to paragraph 9B.12, if an aircraft carries ADS-B transmitting equipment for operational use in Australian territory:

(a) the equipment must comply with an approved equipment configuration under Appendix XI, XII, XIII or XIV in accordance with the Application provisions of the Appendix; and

(b) for Appendix XIV, any administrative standard included in the Appendix must be complied with.

9B.4 When serviceable ADS-B transmitting equipment is operated in Australian territory, the equipment must transmit:

(a) the current aircraft address; and

(b) a flight identification that:

(i) corresponds exactly to the aircraft identification mentioned on the flight notification filed with ATC for the flight; or

(ii) if a flight notification is not filed for the flight — is:

(A) for an aircraft registered on the Australian Civil Aircraft Register and operating wholly within Australian territory — the aircraft's registration mark; or

(B) for an Australian aircraft registered by a RAAO — in accordance with the organisation's operations manual; or

(iii) is directed or approved by ATC.

9B.5 If an aircraft in flight carries serviceable ADS-B transmitting equipment, the equipment must be operated:

(a) for equipment that complies with an approved equipment configuration set out in Appendix XI — continuously during the flight in all airspace and at all altitudes, unless the pilot is directed or approved otherwise by ATC; and

(b) for equipment that complies with the approved equipment configuration set out in Appendix XII, XIII, or XIV — continuously during the flight, within the airspace and within the altitude limits specified for the flight in the applicable Appendix, unless the pilot is directed or approved otherwise by ATC.

9B.6 Subject to paragraph 9B.7, if an aircraft carries ADS-B transmitting equipment which does not comply with an approved equipment configuration, the aircraft must not fly in Australian territory unless the equipment is:

(a) deactivated; or

(b) set to transmit only a value of zero for the NUCp, NACp, NIC or SIL.

Note It is considered equivalent to deactivation if NUCp, NACp, NIC or SIL is set to continually transmit only a value of zero.

9B.7 The ADS-B transmitting equipment need not be deactivated for paragraph 9B.6 if the aircraft is undertaking an ADS-B test flight in VMC in airspace below FL290.

9B.8 An aircraft that is operated:

(a) in an IFR operation; or

(a) in any operation at or above FL290;

must carry serviceable ADS-B transmitting equipment that complies with the approved equipment configuration set out in Appendix XI.

9B.9 If an aircraft is operated in a VFR operation below FL290:

(a) it may carry serviceable ADS-B transmitting equipment (the ***equipment***); and

(b) if it carries the equipment — the equipment must comply with the approved equipment configuration set out in Appendix XI, XII, XIII or XIV.

9B.10 Paragraph 9B.8 does not apply to an aircraft if:

(a) the aircraft owner, operator or pilot has written authorisation from CASA for the operation of the aircraft without the ADS-B transmitting equipment; or

(b) the equipment is unserviceable for a flight, and each of the following applies:

(i) the flight takes place within 3 days of the discovery of the unserviceability;

(ii) at least 1 of the following applies for the flight:

(A) flight with unserviceable equipment has been approved by CASA, in writing, subject to such conditions as CASA specifies;

(B) the unserviceability is a permissible unserviceability set out in the minimum equipment list for the aircraft and any applicable conditions of a direction under subregulation 37 (2) of CAR 1988 have been complied with;

(iii) before it commences, ATC clears the flight despite the unserviceability.

9B.11 Unless otherwise approved in writing by CASA, ADS-B transmitting equipment carried on an aircraft must allow the pilot to activate and deactivate transmission during flight.

Note This requirement is met if the ADS-B transmitting equipment has a cockpit control that enables the pilot to turn ADS-B transmissions on and off.

9B.12 A requirement under Appendix XI, XII, or XIII that an approved equipment configuration for ADS-B transmitting equipment be authorised in accordance with a

specific TSO or ETSO does not apply to the ADS-B transmitting equipment carried on certain light sport, experimental and other aircraft provided that:

(a) the equipment configuration that is carried provides the pilot, other aircraft and ATC with the same transponder and surveillance capability as would be provided if the equipment were expressly authorised in accordance with the specific TSO or ETSO; and

(b) the pilot or the operator has a statement of conformance (however described) from the equipment manufacturer stating the particular standard or standards of the TSO or ETSO with which the equipment conforms.

9BA Instructions — SSR transponder equipment

9BA.1 For subregulation 174A (1) of CAR, this subsection specifies the SSR transponder equipment that must be carried on certain aircraft before they undertake a VFR flight.

9BA.2 Unless this subsection provides otherwise, an aircraft must carry serviceable SSR transponder equipment in accordance with subsection 9E.

9BA.3 A serviceable Mode A and Mode C SSR transponder must be carried on an aircraft that:

(a) was manufactured before 6 February 2014; and

(b) has not been modified by having its transponder installation replaced on or after that date; and

(c) operates under the VFR and within ATC radar coverage, in Class A airspace below FL290, in Class B airspace, or in Class C airspace.

Note Carriage of a Mode A and Mode C transponder does not remove the requirement to obtain CASA approval to operate in Class A airspace: see subregulation 99AA (3) of CAR.

9BA.4 Paragraph 9BA.3 does not apply if the aircraft carries serviceable Mode S transponder that meets the standards set out in subparagraph 9E.2 (c)

9BA.5 A serviceable Mode A and Mode C SSR transponder must be carried on an aircraft that:

(a) was manufactured before 6 February 2014; and

(b) has not been modified by having its transponder installation replaced on or after that date; and

(c) has an engine-driven electrical system capable of continuously powering a transponder; and

(d) operates under the VFR in Class E airspace, or above 10 000 ft AMSL in Class G airspace.

9BA.6 Paragraph 9BA.5 does not apply if the aircraft carries:

(a) a serviceable Mode S transponder that meets the standards set out in subparagraph 9E.2 (c); or

(b) a serviceable integrated TABS device that meets the standards set out in Appendix XIII.

9BA.7 This paragraph repeals instrument CASA 316/98.

9C Standards for Mode S transponder equipment

9C.1 This subsection applies to an aircraft engaged in private, aerial work, charter or RPT operations.

9C.2 If the aircraft carries Mode S transponder equipment (the ***equipment***), the equipment must meet the standards set out in this subsection.

9C.3 The equipment must be of a type that is authorised by:

(a) the FAA, in accordance with TSO-C112( ) as in force on 5 February 1986, or a later version as in force from time to time; or

(b) EASA, in accordance with ETSO-C112a as in force on 24 October 2003, or a later version as in force from time to time; or

(c) CASA, in accordance with an instrument of approval of the type.

Note CASA Advisory Circular 21-46 provides guidelines on Mode S transponder equipment.

9C.4 The aircraft address entered into the equipment must exactly correspond to the aircraft address assigned to the aircraft by CASA or the relevant RAAO.

9C.5 The equipment must transmit each of the following when interrogated on the manoeuvring area of an aerodrome or in flight:

(a) the aircraft address;

(b) the Mode A code;

(c) the Mode C code;

(d) subject to paragraph 9C.7, the aircraft flight identification in accordance with paragraph 9C.6.

9C.6 The aircraft flight identification must:

(a) if a flight notification is filed with ATC for the flight — correspond exactly with the aircraft identification mentioned on the flight notification; or

(b) if no flight notification is filed with ATC for the flight:

(i) for an aircraft registered on the Australian Civil Aircraft Register — be the aircraft registration mark; or

(ii) for an Australian aircraft registered by a RAAO — be in accordance with the RAAO's operations manual; or

(c) be another flight identification directed or approved for use by ATC.

9C.7 Mode S transponder transmission of the aircraft flight identification is optional for any aircraft that was manufactured before 9 February 2012 (an ***older aircraft***). However, if an older aircraft is equipped to transmit, and transmits, an aircraft flight identification then that aircraft flight identification must be in accordance with paragraph 9C.6.

9C.8 If the equipment transmits any Mode S EHS DAPs, the transmitted DAPs must comply with the standards set out in paragraph 3.1.2.10.5.2.3 and Table 3-10 of Volume IV, Surveillance and Collision Avoidance Systems, of Annex 10 of the Chicago Convention.

Note 1 Paragraph 3.1.2.10.5.2.3 includes 3.1.2.10.5.2.3.1, 3.1.2.10.5.2.3.2 and 3.1.2.10.5.2.3.3.

Note 2 Australian Mode S SSR are EHS DAPs-capable, and operational use of EHS DAPs is to be introduced in Australia. Implementation of Mode S EHS DAPs transmissions that are not in accordance with the ICAO standards may be misleading to ATC. Operators need to ensure that correct parameters are being transmitted.

9C.9 If the equipment is carried in an aircraft manufactured on or after 9 February 2012:

(a) having a certificated maximum take-off weight above 5 700 kg; or

(b) that is capable of normal operation at a maximum cruising true air speed above 250 knots;

the equipment's receiving and transmitting antennae must:

(c) be located in the upper and lower fuselage; and

(d) operate in diversity, as specified in paragraphs 3.1.2.10.4 to 3.1.2.10.4.5 (inclusive) of Volume IV, Surveillance and Collision Avoidance Systems, of Annex 10 of the Chicago Convention.

Note Paragraph 3.1.2.10.4.2.1 is recommendatory only.

9C.10 Subject to paragraph 9C.11, if Mode S transponder equipment incorporates ADS-B functionality, the equipment must comply with the applicable approved equipment configuration required under subsection 9B for ADS-B transmitting equipment.

9C.11 For paragraphs 9C.3 and 9C.10, a requirement that the equipment be authorised in accordance with a specific TSO or ETSO does not apply to Mode S transponder equipment carried on certain light sport, experimental and other aircraft provided that:

(a) the equipment configuration that is carried provides the pilot, other aircraft and ATC with the same transponder and surveillance capability as would be provided if the equipment were expressly authorised in accordance with the specific TSO or ETSO; and

(b) the pilot or the operator has a statement of conformance (however described) from the equipment manufacturer stating the particular standard or standards of the TSO or ETSO with which the equipment conforms.

9D Directions for mandatory GNSS equipment for I.F.R. flight

Note This subsection provides for minimum equipage for GNSS navigation. Some operations under RNP may require additional equipment under CAO 20.91.

Definitions

9D.1 In this subsection:

ADF equipment means automatic direction finding equipment.

CAO means Civil Aviation Order.

EASA means the European Aviation Safety Agency.

(E)TSO means FAA Technical Standard Order and/or European Technical Standard Order.

ETSO means European Technical Standard Order of EASA.

FAA means the Federal Aviation Administration of the United States of America.

GNSS means the Global Navigation Satellite System.

paragraph 9D.9 standards means the standard set out in paragraph 9D.9 for GNSS navigation equipment.

paragraph 9D.10 standards means the standard set out in paragraph 9D.10 for GNSS navigation equipment.

paragraph 9D.11 standards means the standard set out in paragraph 9.11 for GNSS navigation equipment.

paragraph 9D.12 standards means the standard set out in paragraph 9D.12 for ADF and VOR equipment.

recognised country means a country listed in the Table in Appendix 1 of CAO 100.16.

RNP means required navigation performance.

TSO means Technical Standard Order of the FAA.

VOR navigation receiver means very high frequency (VHF) omni-range navigation receiver.

9D.2 Subject to paragraph 9D.1, in this subsection words and phrases have the same meaning as in subsection 9B.

GNSS navigation for RPT operations and charter operations under the I.F.R.

9D.3 An aircraft:

(a) that is manufactured on or after 6 February 2014; and

(b) that is engaged in RPT operations or charter operations under the I.F.R.;

must carry at least all of the serviceable equipment mentioned in 1 of the following subparagraphs:

(c) at least 2 independent GNSS navigation equipments that meet paragraph 9D.9 standards;

(d) at least:

(i) a single GNSS equipment that meets paragraph 9D.9 standards; and

(ii) an ADF or a VOR navigation receiver that meets paragraph 9D.12 standards;

(e) a multi-sensor navigation system that includes GNSS and inertial integration and is approved by CASA as providing an alternate means of compliance to the requirements of paragraph 9D.9.

9D.4 An aircraft:

(a) that is manufactured before 6 February 2014; and

(b) that is engaged in RPT operations or charter operations under the I.F.R.;

must carry at least all of the serviceable equipment mentioned in subparagraph 9D.3 (c), (d) or (e) if GNSS equipment is installed on the aircraft on or after 6 February 2014.

9D.5 On and after 4 February 2016, an aircraft:

(a) that is manufactured before 6 February 2014; and

(b) that is engaged in RPT operations or charter operations under the I.F.R.;

must carry at least all of the serviceable equipment mentioned in 1 of the following subparagraphs:

(c) at least 2 independent GNSS navigation equipments that meet paragraph 9D.9 standards;

(d) at least:

(i) a single GNSS equipment that meets paragraph 9D.10 standards; and

(ii) an ADF or a VOR navigation receiver that meets paragraph 9D.12 standards;

(e) a multi-sensor navigation system that includes GNSS and inertial integration and is approved by CASA as providing an alternate means of compliance to the requirements of paragraph 9D.9.

GNSS navigation for aerial work operations and private operations under the I.F.R.

9D.6 An aircraft:

(a) that is manufactured on or after 6 February 2014; and

(b) that is engaged in aerial work operations or private operations under the I.F.R.;

must carry at least 1 serviceable GNSS navigation equipment that meets paragraph 9D.9 standards.

9D.7 An aircraft:

(a) that is manufactured before 6 February 2014; and

(b) that is engaged in aerial work operations or private operations under the I.F.R.;

must carry at least 1 serviceable GNSS navigation equipment that meets paragraph 9D.9 standards, if GNSS equipment is installed on the aircraft on or after 6 February 2014.

9D.8 On and after 4 February 2016, an aircraft:

(a) that is manufactured before 6 February 2014; and

(b) that is engaged in aerial work operations or private operations under the I.F.R.;

must carry at least all of the serviceable equipment mentioned in 1 of the following subparagraphs:

(c) at least 1 serviceable GNSS navigation equipment that meets paragraph 9D.9 standards;

(d) at least:

(i) a single GNSS equipment that meets paragraph 9D.11 standards; and

(ii) an ADF or a VOR navigation receiver that meets paragraph 9D.12 standards;

(e) a multi-sensor navigation system that includes GNSS and inertial integration and is approved by CASA as providing an alternate means of compliance to the requirements of paragraph 9D.9.

Standards for GNSS navigation equipment, and ADF and VOR equipment

Paragraph 9D.9 standards

9D.9 For the paragraph 9D.9 standards, GNSS equipment must be of a type that is authorised in accordance with 1 of the following (E)TSOs, or a later version of the (E)TSO as in force from time to time:

(a) (E)TSO-C145( );

(b) (E)TSO-C146( );

(c) (E)TSO-C196a.

Paragraph 9D.10 standards

9D.10 For the paragraph 9D.10 standards, GNSS equipment must be of a type that is authorised in accordance with 1 of the following (E)TSOs, or a later version of the (E)TSO as in force from time to time:

(a) (E)TSO-C129( );

(b) (E)TSO-C145( );

(c) (E)TSO-C146( );

(d) (E)TSO-C196a.

Note 1 GNSS equipment in accordance with (E)TSO-C129( ) is unlikely to support ADS-B position source equipment requirements.

Note 2 If GNSS equipment in accordance with (E)TSO-C129( ) is used, the requirement for navigation to an alternate aerodrome must be met by using ADF or VOR navigation.

Paragraph 9D.11 standards

9D.11 For the paragraph 9D.11 standards, GNSS equipment must be of a type that is authorised in accordance with (E)TSO-C129( ), or a later version of the (E)TSO as in force from time to time.

Note 1 GNSS equipment in accordance with (E)TSO-C129( ) is unlikely to support ADS-B position source equipment requirements.

Note 2 If GNSS equipment in accordance with (E)TSO-C129( ) is used, the requirement for navigation to an alternate aerodrome must be met by using ADF or VOR navigation.

Paragraph 9D.12 standards

9D.12 For the paragraph 9D.12 standards, ADF equipment and VOR navigation receivers must be of a type that is certified by 1 of the following:

(a) the FAA;

(b) EASA;

(c) NAA of a recognised country.

9E Carriage of Mode S transponder equipment

9E.1 This subsection applies to an aircraft engaged in private, aerial work, charter or RPT operations.

9E.2 Subject to paragraph 9E.3, an aircraft:

(a) that is:

(i) manufactured on or after 6 February 2014; or

(ii) modified by having its transponder installation replaced on or after 6 February 2014; and

(b) that is operated:

(i) in Class A, B, C or E airspace; or

(ii) above 10 000 feet above mean sea level in Class G airspace;

must carry:

(c) a serviceable Mode S transponder that meets the standards:

(i) for Mode S transponder equipment — in subsection 9C; and

(ii) for ADS-B transmission using an approved equipment configuration set out in Appendix XI — in a clause or clauses of Appendix XI as follows:

(A) clauses 2 and 5 of Part B; or

(B) clause 7 of Part C; or

(C) clause 8 of Part C; and

(iii) for ADS-B transmission using an approved equipment configuration set out in Appendix XII — in clauses 1 and 4 in Part B of Appendix XII; or

Note The requirement is for aircraft to be fitted with a Mode S transponder with ADS-B OUT capability. That does not mean that ADS-B OUT transmission is also required under this paragraph. It means that, with the later connection of compatible GNSS position source equipment, ADS-B OUT can be transmitted as well as Mode S SSR responses.

(d) for an aircraft that is operated under the VFR:

(i) in Class E airspace; or

(ii) above 10 000 feet AMSL in Class G airspace;

a serviceable integrated TABS device that meets the standards in Appendix XIII.

Note An aircraft operated under the VFR in Class E airspace or above 10 000 ft AMSL in Class G airspace has the option of complying with either subparagraph (c) or (d).

An aircraft operated under the VFR or the IFR in Class A, B, or C airspace has no option but to comply with subparagraph (c).

An aircraft operated under the IFR in Class E airspace or above 10 000 ft AMSL in Class G airspace has no option but to comply with subparagraph (c).

9E.3 Paragraph 9E.2 does not apply to an aircraft:

(a) operating in Class E airspace; or

(b) operating above 10 000 feet above mean sea level in Class G airspace;

if the aircraft does not have:

(c) an engine; or

(d) sufficient engine-driven electrical power generation capacity to power a Mode S transponder.

9E.4 An aircraft operating at Brisbane, Sydney, Melbourne, or Perth aerodrome must carry a serviceable Mode S transponder that meets the standards of:

(a) subsection 9C; and

(b) the following clause or clauses of Appendix XI:

(i) clauses 2 and 5 of Part B; or

(ii) clause 7 of Part C; or

(iii) clause 8 of Part C.

Note 1 A Mode A/C transponder does not meet this requirement.

Note 2 ADS-B OUT transmission is not mandatory but the Mode S transponder must be ADS-B capable.

9E.5 Paragraphs 9E.2 and 9E.4 do not apply to an aircraft for a flight if the Mode S transponder equipment is unserviceable for the flight, and each of the following applies:

(a) the flight takes place within 3 days of the discovery of the unserviceability;

(b) at least 1 of the following applies for the flight:

(i) flight with unserviceable equipment has been approved by CASA, in writing, subject to such conditions as CASA specifies;

(ii) the unserviceability is a permissible unserviceability set out in the minimum equipment list for the aircraft, and any applicable conditions under subregulation 37 (2) of CAR 1988 have been complied with;

(c) ATC clears the flight despite the unserviceability.

10 Serviceability

10.1 In the case of a charter or RPT aircraft, all instruments and equipment that it carries, or is fitted with, under subregulation 207 (2) of CAR 1988 must be serviceable before take-off, unless:

(a) flight with unserviceable instruments or equipment has been approved by CASA, subject to such conditions as CASA specifies; or

(b) the unserviceability is a permissible unserviceability set out in the minimum equipment list for the aircraft and any applicable conditions under subregulation 37 (2) of CAR 1988 have been complied with; or

(c) CASA has approved the flight with the unserviceable instrument or equipment and any applicable conditions that CASA has specified, in writing, have been complied with; or

(d) the unserviceable instrument or equipment is a passenger convenience item only and does not affect the airworthiness of the aircraft.

Note Equipment referred to in paragraph 10.1 includes oxygen and protective breathing equipment, emergency lifesaving equipment, seats, seat belts and safety equipment that are required to meet an applicable standard, and other instruments and equipment required to be carried or fitted under this Order.

10.1A A private or aerial work aircraft must not be operated:

(a) under the V.F.R., unless:

(i) all instruments and equipment required to be fitted to the aircraft under subsection 3 are serviceable before take-off; or

(ii) CASA has approved the flight with the unserviceable instrument or equipment and any applicable conditions that CASA has specified, in writing, have been complied with; or

(b) under the I.F.R., unless:

(i) all instruments and equipment required to be fitted to the aircraft under subsection 4 are serviceable before take-off; or

(ii) CASA has approved the flight with the unserviceable instrument or equipment and any applicable conditions that CASA has specified, in writing, have been complied with.

10.2 Where flight is conducted with unserviceable instruments or equipment under the provisions of paragraph 10.1 or 10.1A, the unserviceable instruments or equipment must be prominently placarded "UNSERVICEABLE" or removed from the aircraft.

Note Where an instrument or piece of equipment performs more than 1 function, it is permissible to placard as unserviceable only the function(s) which are unserviceable.

10.3 The holder of an AOC authorising an RPT operation must:

(a) have a minimum equipment list or lists for the aircraft used to conduct those operations; and

(b) include each list in the operations manual for the aircraft to which that list applies.

10.4 The holder of an AOC authorising charter operations:

(a) may have a minimum equipment list or lists for the aircraft used to conduct those operations; and

(b) must include each list in the operations manual for the aircraft to which that list applies.

Appendix I

Instruments required for flight under the V.F.R.

(Limited to aircraft specified in subsection 3, paragraph 3.1)

1 The flight and navigational instruments required for flights under the V.F.R. are:

(a) an airspeed indicating system; and

(b) an altimeter, with a readily adjustable pressure datum setting scale graduated in millibars; and

(c) (i) a direct reading magnetic compass; or

(ii) a remote indicating compass and a standby direct reading magnetic compass; and

(d) an accurate timepiece indicating the time in hours, minutes and seconds. This may be carried on the person of the pilot or navigator.

2 In addition to the instruments required under clause 1, aircraft, other than helicopters, engaged in charter, or aerial work, operations and operating under the V.F.R., must be equipped with:

(a) a turn and slip indicator (agricultural aeroplanes may be equipped with a slip indicator only); and

(b) an outside air temperature indicator when operating from an aerodrome at which ambient air temperature is not available from ground-based instruments.

Appendix II

Instruments required for:

(i) aeroplanes engaged in RPT operations; and

(ii) aeroplanes engaged in charter operations which have a maximum take-off weight greater than 5 700 kg

1 The flight and navigation instruments required are:

(a) an airspeed indicating system with means of preventing malfunctioning due to either condensation or icing; and

(b) 2 sensitive pressure altimeters; and

(c) (i) a direct reading magnetic compass; or

(ii) a remote indicating compass and a standby direct reading magnetic compass; and

(d) an accurate timepiece indicating the time in hours, minutes and seconds; and

(e) a rate of climb and descent indicator (vertical speed indicator); and

(f) an outside air temperature indicator; and

(g) 2 attitude indicators (artificial horizons); and

(h) a heading indicator (directional gyroscope or equivalent approved by CASA); and

(i) a turn and slip indicator except that only a slip indicator is required when a third attitude indicator usable through flight attitudes of 360 degrees of pitch and roll is installed in accordance with paragraph (k) of this Appendix; and

(j) a means of indicating whether the power supply to those instruments requiring power is working satisfactorily; and

(k) in turbo-jet aeroplanes having a maximum take-off weight greater than 5 700 kg and in turbo-prop aeroplanes having a maximum take-off weight greater than 18 000 kg a third attitude indicator which:

(i) is powered from a source independent of the electrical generating system; and

(ii) continues to provide reliable indications for a minimum of 30 minutes after total failure of the electrical generating system; and

(iii) is operative without selection after total failure of the electrical generating system; and

(iv) is located on the instrument panel in a position which will make it plainly visible to, and usable by, any pilot at his station; and

(v) is appropriately lighted during all phases of operation; and

(l) in turbo-jet aeroplanes with operating limitations expressed in terms of Mach number, a Mach number indicator (Machmeter).

2 (a) For aeroplanes above 5 700 kg maximum take-off weight, the instruments used by the pilot in command and which are specified in paragraphs 1 (a), (b), (e) and (l) of this Appendix must be capable of being connected either to a normal or an alternate static source but not both sources simultaneously. Alternatively, the aeroplane may be fitted with 2 independent static sources each consisting of a balanced pair of flush static ports of which 1 is used for the instruments specified

above. Instruments and equipment other than flight instruments provided for use by the pilot in command, must not be connected to the normal static system that operates the instruments of the pilot in command;

(b) for aeroplanes not above 5 700 kg maximum take-off weight, the instruments specified in paragraphs 1 (a), (b), (e) and (l) of this Appendix must be capable of being connected to either a normal or alternate static source but not both sources simultaneously. Alternatively, the aeroplane may be fitted with a balanced pair of flush static ports.

3 The instruments specified in paragraphs 1 (g), (h) and (i) of this Appendix must have duplicated sources of power supply.

4 CASA may, having regard to the type of aeroplane, approve an attitude indicator incorporated in an automatic pilot system being 1 of the 2 attitude indicators required by paragraph 1 (g) of this Appendix.

5 A gyro-magnetic type of remote indicating compass installed to meet the requirements of paragraph 1 (c) (ii) of this Appendix may also be considered to meet the requirement for a heading indicator specified in paragraph 1 (h) of this Appendix, provided that it has a duplicated power supply.

6 For V.F.R. flight, the following instruments may be unserviceable:

(a) the attitude indicator required by paragraph 1 (k);

(b) 1 of the attitude indicators required by paragraph 1 (g) provided that the attitude indicator required by paragraph 1 (k) is serviceable or an attitude indicator has been provided to meet the requirements of paragraph 1 (i) and is serviceable;

(c) the turn and slip indicator or slip indicator and attitude indicator required by paragraph 1 (i).

Appendix III

Instruments required for aeroplanes with a maximum take-off weight not greater than 5 700 kg engaged in charter operations under the I.F.R. (except night V.M.C.) excluding freight only charter operations

1 The flight and navigation instruments required are:

(a) an airspeed indicating system with means of preventing malfunctioning due to either condensation or icing; and

(b) 2 sensitive pressure altimeters; and

(c) (i) a direct reading magnetic compass; or

(ii) a remote indicating compass and a standby direct reading magnetic compass; and

(d) an accurate timepiece indicating the time in hours, minutes and seconds; and

(e) a rate of climb and descent indicator (vertical speed indicator); and

(f) an outside air temperature indicator; and

(g) 2 attitude indicators (artificial horizons); and

(h) a heading indicator (directional gyroscope or equivalent approved by CASA); and

(i) a turn and slip indicator except that only a slip indicator is required when a third attitude indicator usable through flight attitude of 360 degrees pitch and roll is installed; and

(j) a means of indicating whether the power supply to the gyroscopic instruments is working satisfactorily; and

(k) in turbo-jet aeroplanes with operating limitations expressed in terms of Mach number, a Mach number indicator (Machmeter).

2 The instruments specified in paragraphs 1 (a), (b), (e) and (k) of this Appendix must be capable of being connected to either a normal or alternate static source but not both sources simultaneously. Alternatively, they may be connected to a balanced pair of flush static ports.

3 The instruments specified in paragraphs 1 (g), (h) and (i) of this Appendix must have duplicated sources of power supply.

4 CASA may, having regard to the type of aeroplane, approve an attitude indicator incorporated in an automatic pilot system as being 1 of the 2 attitude indicators required by paragraph 1 (g) of this Appendix.

5 A gyro-magnetic type of remote indicating compass installed to meet the requirements of subparagraph 1 (c) (ii) of this Appendix may also be considered to meet the requirement for a heading indicator specified in paragraph 1 (h) of this Appendix, provided it has a duplicated power supply.

Appendix IV

Instruments required for aeroplanes engaged in:

(i) aerial work and private operations under the I.F.R. (including night V.M.C.); and

(ii) charter operations under night V.M.C; and

(iii) I.F.R. freight only charter operations in aeroplanes with maximum take-off weight not greater than 5 700 kg.

1 The flight and navigational instruments required are:

(a) an airspeed indicating system; and

(b) a sensitive pressure altimeter; and

(c) (i) direct reading magnetic compass; or

(ii) a remote indicating compass and a standby direct reading magnetic compass; and

(d) an accurate timepiece indicating the time in hours, minutes and seconds, except that this may be omitted if it is carried on the person of the pilot or navigator; and

(e) a rate of climb and descent indicator (vertical speed indicator) for other than night V.M.C. flights; and

(f) an outside air temperature indicator; and

(g) an attitude indicator (artificial horizon); and

(h) a heading indicator (directional gyroscope); and

(i) a turn and slip indicator except that only a slip indicator is required when a second attitude indicator usable through flight attitudes of 360 degrees of pitch and roll is installed; and

(j) means of indicating whether the power supply to the gyroscopic instruments is working satisfactorily; and

(k) except for aeroplanes engaged in night V.M.C. flights, means of preventing malfunctioning due to either condensation or icing of at least 1 airspeed indicating system.

2 The instruments specified in paragraphs 1 (a), (b), (e) and (k) of this Appendix must be capable of being connected to either a normal or an alternate static source but not both sources simultaneously. Alternatively, they may be connected to a balanced pair of flush static ports.

3 Except for aeroplanes engaged in night V.M.C. private and aerial work operations the instruments specified in paragraphs 1 (g), (h) and (i) of this Appendix must have duplicated sources of power supply unless the turn and slip indicator or the second attitude indicator specified in paragraph 1 (i) has a source of power independent of the power operating other gyroscopic instruments.

4 A gyro-magnetic type of remote indicating compass installed to meet the requirements of subparagraph 1 (c) (ii) of this Appendix may be considered also to meet the requirement for a heading indicator specified in paragraph 1 (h) of this Appendix, provided that such installation complies with the power supply requirements of clause 3 of this Appendix.

Appendix V

Electric lighting equipment flight under the I.F.R. at night (including night V.M.C.)

The electric lighting equipment is:

1 Instrument illumination

Illumination for all instruments and equipment, used by the flight crew, that are essential for the safe operation of the aircraft. The illumination must be such that:

(a) all illuminated items are easily readable or discernible, as applicable; and

(b) its direct or reflected rays are shielded from the pilot's eyes; and

(c) its power supply is so arranged that in the event of the failure of the normal source of power, an alternative source is immediately available; and

(d) it emanates from fixed installations.

2 Intensity control

Means of controlling the intensity of the illumination of instrument lights, unless it can be demonstrated that non-dimmed instrument lights are satisfactory under all conditions of flight likely to be encountered.

3 Landing lights

2 landing lights except that, in accordance with the provisions of regulation 308 of CAR 1988, aircraft engaged in private and aerial work operations and charter operations not carrying passengers for hire and reward are exempted from this requirement provided that 1 landing light is fitted.

Note A single lamp having 2 separately energised filaments may be approved as meeting the requirement for 2 landing lights.

4 Passenger compartment lights

Lights in all passenger compartments.

5 Pilots' compartment lights

Means of lighting the pilots' compartment to provide illumination adequate for the study of maps and the reading of flight documents.

6 Position and anti-collision lights

Equipment for displaying the lights prescribed in regulation 196 of CAR 1988.

Note In accordance of the provision of subregulation 195 (1) of CAR 1988, position and anti-collision lights must be displayed at night and in conditions of poor visibility.

7 Emergency lighting

Emergency lighting and a shock-proof electric torch for each crew member at the crew member station.

Appendix VI

Instruments required for V.F.R. operations — helicopters

1 The flight and navigational instruments required are:

(a) an airspeed indicating system; and

(b) a pressure altimeter with a readily adjustable pressure datum setting scale graduated in millibars; and

(c) (i) a direct reading magnetic compass; or

(ii) a remote indicating magnetic compass and a standby direct reading magnetic compass; and

(d) an accurate timepiece indicating hours, minutes and seconds. This may be carried on the person of the pilot or navigator.

2 In addition to the instruments required under clause 1, helicopters engaged in RPT, charter, or aerial work, operations and operating under the V.F.R. must be equipped with:

(a) a slip indicator; and

(b) an outside air temperature indicator when operating from or to a location at which ambient air temperature is not available from ground-based instruments.

Appendix VII

Instruments required for I.F.R. operations in helicopters (except night V.M.C.)

1 The flight and navigational instruments required in a helicopter which is required to be operated by 2 pilots are:

(a) 2 airspeed indicators together with 1 airspeed indicating system with means of preventing malfunction due to either condensation or icing; and

(b) 2 sensitive pressure altimeters; and

(c) (i) a direct reading magnetic compass; or

(ii) a remote indicating compass and a standby direct reading magnetic compass; and

(d) an accurate timepiece indicating the time in hours, minutes and seconds; and

(e) 2 instantaneous vertical speed indicators; and

(f) an outside air temperature indicator; and

(g) 2 attitude indicators (artificial horizons) having a 5 inch dial presentation and a standby attitude indicator positioned so as to be usable by the pilot in command and plainly visible by both pilots by day and by night; and

(h) a heading indicator (directional gyroscope); and

(i) 2 slip indicators; and

(j) provision to indicate whether the power supply to the gyroscopic instruments is working satisfactorily.

2 The minimum flight and navigation instruments required in a helicopter which is operated by a single pilot are:

(a) an airspeed indicating system with means of preventing malfunction due to either condensation or icing; and

(b) 2 sensitive pressure altimeters; and

(c) (i) a direct reading magnetic compass; or

(ii) a remote indicating compass and a standby direct reading magnetic compass; and

(d) an accurate timepiece indicating the time in hours, minutes and seconds; and

(e) instantaneous vertical speed indicator; and

(f) an outside air temperature indicator; and

(g) an attitude indicator having a 5 inch dial presentation and a standby attitude indicator positioned so as to be usable by the pilot; and

(h) a heading indicator (directional gyroscope); and

(i) a slip indicator; and

(j) provision to indicate whether the power supply to the gyroscopic instruments is working satisfactorily.

3 The instruments specified in paragraphs 1 (a), (b) and (e) and 2 (a), (b) and (e) of this Appendix must be capable of being connected to more than 1 static source or must be connected to a balanced pair of flush static ports. Instruments and equipment other than mandatory flight instruments must not be connected to the static system that operates the instruments used by the pilot in command.

4 The instruments specified in paragraphs 1 (h) and 2 (h) must have a duplicated source of power supply.

5 The 5 inch dial attitude indicators specified in paragraphs 1 (g) and 2 (g) must have duplicate sources of power supply. The standby attitude indicator must have a power source independent of the electrical generating system and must operate independent of any other attitude indicating system installed.

6 The standby attitude indicator installation specified in paragraphs 1 (g) and 2 (g) must be one in which:

(a) the indicator complies with US Technical Standard Order C4c or equivalent specification acceptable to CASA; and

(b) the indicator and its lighting will continue to operate for 30 minutes following the failure of the electrical power generating system without any action by the flight crew; and

(c) the position size and lighting of the instrument display allows its use from the pilot in command's operating station by day and by night; and

(d) the operation is independent of other attitude indicator installations.

7 CASA may, having regard to the type of helicopter, approve an attitude indicator incorporated in an automatic pilot system as being 1 of the 2 attitude indicators required by paragraph 1 (g) of this Appendix.

8 A gyro-magnetic type of remote indicating compass installed to meet the requirements of subparagraph 1 (c) (ii) and 2 (c) (ii) of this Appendix may be considered also to meet the requirement for a heading indicator specified in paragraph 1 (h) or 2 (h) of this Appendix, provided that such installation complies with the power supply requirements of clause 4 of this Appendix.

9 CASA may, having regard to the type of helicopter, and the flight presentation, response and acuity standard of the instrument concerned, approve the use of attitude indicators which have a dial presentation of less than 5 inches, in lieu of the indicators specified at paragraphs 1 (g), 2 (g) and 5 of this Appendix.

Appendix VIII

Instruments required for night V.M.C. flight in helicopters except while engaged in agricultural operations

1 The flight and navigational instruments required are:

(a) an airspeed indicating system; and

(b) a sensitive pressure altimeter; and

(c) (i) a direct reading magnetic compass; or

(ii) a remote indicating compass and a standby direct reading magnetic compass; and

(d) an accurate timepiece indicating the time in hours, minutes and seconds. This may be carried on the person of the pilot or navigator; and

(e) an outside air temperature indicator; and

(f) an attitude indicator (artificial horizon); and

(i) standby attitude indicator; or

(ii) turn indicator; and

(g) a heading indicator (directional gyroscope); and

(h) a slip indicator; and

(i) a vertical speed indicator; and

(j) means of indicating whether the power supply to the gyroscopic instruments is working satisfactorily.

2 For operations onto vessels or platforms at sea by night an instantaneous vertical speed indicator is required in place of the vertical speed indicator specified at paragraph 1 (i) of this Appendix.

3 The attitude indicator and standby attitude indicator or turn indicator as specified in paragraph 1 (f) of this Appendix, must have separate and independent power sources.

4 A gyro-magnetic type of remote indicating compass installed to meet the requirements of subparagraph 1 (c) (ii) of this Appendix may be considered also to meet the requirement for a heading indicator specified in paragraph 1 (g) of this Appendix, provided that such installation complies with the power supply requirements of clause 3 of this Appendix.

Appendix IX

Instruments required for helicopters engaged in night V.M.C. agricultural operations

The flight and navigational instruments required are:

(a) an airspeed indicating system; and

(b) a sensitive pressure altimeter; and

(c) (i) a direct reading magnetic compass; or

(ii) a remote indicating compass and a standby direct reading magnetic compass; and

(d) an accurate timepiece indicating the time in hours, minutes and seconds. This may be carried on the person of the pilot or navigator; and

(e) an outside air temperature indicator; and

(f) an attitude indicator (artificial horizon); and

(g) a vertical speed indicator; and

(h) a slip indicator; and

(i) a means of indicating whether the power supply to the gyroscopic instrument is working satisfactorily.

Appendix X

Instruments required for manned free balloons and hot air airships for flight by day under the V.F.R.

The flight and navigational instruments required for flight under the V.F.R. by day are:

(a) an altimeter, with a readily adjustable pressure datum setting scale graduated in hectopascals; and

(b) a timepiece, which may be carried on the person of the pilot, that is accurate to, and readable to, the nearest minute for the duration of the flight; and

(c) a vertical speed indicator; and

(d) in the case of a hot air airship that has a maximum permissible forward airspeed less than that attainable with the engine(s) operating at full power, an instrument capable of indicating when the maximum speed is reached; and

(e) in the case of a hot manned free balloon or hot air airship, an envelope temperature indicator; and

(f) in the case of a hot air manned free balloon or a hot air airship, a free air temperature indicator or an air temperature indicator that provides readings convertible to free air temperature; and

(g) in the case of a pressurised hot air airship, an internal pressure indicator.

Appendix XI — Approved equipment configuration — ADS-B transmitting equipment — IFR and VFR flight

Part A — ADS-B transmitting equipment — approval and application

Approved equipment configuration — IFR and VFR flight

1 Subject to this Part, an equipment configuration for ADS-B transmitting equipment is approved if it complies with the standards specified in Part B or Part C of this Appendix.

Application

2 ADS-B transmitting equipment carried on an aircraft in an IFR flight has an approved equipment configuration if, and only if, it complies with the standards in Part B or Part C of this Appendix.

Note No other Appendix applies to the equipment in an IFR flight.

3 ADS-B transmitting equipment carried on an aircraft in any operation at or above FL290 has an approved equipment configuration if, and only if, it complies with the standards in Part B or Part C of this Appendix.

Note No other Appendix applies to the equipment in an operation above FL290.

4 ADS-B transmitting equipment carried on an aircraft, in a flight that is not an IFR flight or any flight at or above FL290, has an approved equipment configuration if it complies with the standards in Part B or Part C of this Appendix.

Note For example, ADS-B transmitting equipment carried on an aircraft in a VFR flight below FL290 would have an approved equipment configuration if it complied with the standards in Part B or Part C of this Appendix. However, another Appendix may apply to the equipment in the VFR flight.

Part B

ADS-B transmitting equipment — standard for approval

2 ADS-B transmitting equipment must be of a type that:

(a) is authorised in accordance with (E)TSO-C166, or a later version as in force from time to time; or

(b) meets the following requirements:

(i) the type must be accepted by CASA as meeting the specifications in RTCA/DO-260 dated 13 September 2000, or a later version as in force from time to time; and

(ii) the type must utilise HPL at all times HPL is available; or

(c) is otherwise authorised, in writing, by CASA for the purposes of subsection 9B of this Civil Aviation Order as being equivalent to one of the foregoing types.

GNSS position source equipment — standard for aircraft manufactured on or after 8 December 2016

3 For an aircraft manufactured on or after 8 December 2016, the geographical position transmitted by the ADS-B transmitting equipment must be determined by:

(a) a GNSS receiver of a type that is authorised in accordance with (E)TSO-C145a or (E)TSO-C146a, or a later version as in force from time to time; or

(b) a GNSS receiver of a type that is authorised in accordance with (E)TSO-C196a, or a later version as in force from time to time; or

(c) a GNSS receiver or system which meets the following requirements:

(i) is certified by an NAA for use in flight under the I.F.R.;

(ii) has included in its specification and operation the following:

(A) FDE, computed in accordance with the definition at paragraph 1.7.3 of RTCA/DO-229D;

(B) the output function HPL, computed in accordance with the definition at paragraph 1.7.2 of RTCA/DO-229D;

(C) functionality that, for the purpose of HPL computation, accounts for the absence of the SA of the GPS in accordance with paragraph 1.8.1.1 of RTCA/DO-229D; or

(d) another equivalent system authorised in writing by CASA.

Note The following GNSS receivers meet the requirements of clause 3, namely, those certified to (E)TSO-C145a or (E)TSO-C146a, or later versions, or those manufactured to comply with (E)TSO-C196a.

GNSS position source equipment — standard for aircraft manufactured before 8 December 2016

4 For an aircraft manufactured before 8 December 2016, the geographical position transmitted by the ADS-B transmitting equipment must be determined by:

(a) a GNSS receiver or system that complies with the requirements of clause 3, other than sub-subparagraph 3 (c) (ii) (C) which is optional; or

(b) an equivalent GNSS receiver or system that has been approved in writing by CASA.

Note The following GNSS receivers meet the requirements of clause 4, namely, those certified to (E)TSO-C145a or (E)TSO-C146a, or later versions, or those manufactured to comply with (E)TSO-C196a. Some later versions of GNSS receivers certified to (E)TSO-C129 may also meet the requirements, i.e. those having FDE and HPL features incorporated.

Altitude source equipment — standard

5 The pressure altitude transmitted by the ADS-B transmitting equipment must be determined by:

(a) a barometric encoder of a type that is authorised in accordance with (E)TSO-C88a, or a later version as in force from time to time; or

(b) another equivalent system authorised in writing by CASA.

Part C

Alternative approved equipment configuration — standard for aircraft manufactured on or after 8 December 2016

7 For an aircraft manufactured on or after 8 December 2016, an equipment configuration is approved if:

(a) it has been approved or accepted by:

(i) the NAA of a recognised country, as meeting the standards of EASA AMC 20-24 or EASA CS-ACNS; or

(ii) the FAA, as meeting the standards of 14 CFR 91.225 for 1090 Megahertz (MHz) Extended Squitter ADS-B; and

(b) the aircraft flight manual attests to the approval or acceptance; and

(c) the GNSS receiver or system complies with the requirements of clause 3 in Part B.

Alternative approved equipment configuration — standard for aircraft manufactured before 8 December 2016

8 For an aircraft manufactured before 8 December 2016, an equipment configuration is approved if:

(a) it has been approved or accepted by:

(i) EASA as meeting the standards of EASA AMC 20-24; or

(ii) the FAA as meeting the standards of 14 CFR 91.225 for 1090 Megahertz (MHz) Extended Squitter ADS-B; and

(b) the aircraft flight manual attests to the approval or acceptance; and

(c) the GNSS receiver or system complies with the requirements of clause 4 in Part B.

Appendix XII — Approved equipment configuration — Mode S transponder with Class B TABS position source device — VFR flight below FL290 only

Part A — ADS-B transmitting equipment — approval and application

Approved equipment configuration — Mode S transponder with Class B TABS position source device

1 Subject to this Part, an equipment configuration for ADS-B transmitting equipment is approved if it is a Mode S transponder with Class B TABS position source device that complies with the standards specified in Part B of this Appendix.

Application

2 A Mode S transponder with Class B TABS position source device carried on an aircraft has an approved equipment configuration if it complies with:

(a) the standards in Part B of this Appendix; and

(b) the conditions set out in clauses 3 and 4.

Note Another Appendix may apply to the equipment in a VFR flight.

3 For paragraph 2 (b), a Mode S transponder with Class B TABS position source device may only be operated in VFR flight below FL290.

4 For paragraph 2 (b), if a Mode S transponder with Class B TABS position source device transmits a SIL value of less than 2, the aircraft must not enter controlled airspace in which:

(a) aircraft are required to carry serviceable ADS-B transmitting equipment that complies with an approved equipment configuration in accordance with Appendix XI; or

(b) VFR aircraft are required to carry ADS-B transmitting equipment.

Note Carriage of a Mode S transponder with Class B TABS position source device does not remove the requirement to obtain ATC clearance to operate in Class B or C airspace. Nor does it remove the requirement to obtain CASA approval to operate in Class A airspace – see subregulation 99AA (3) of CAR.

Part B — Standards for a Mode S transponder with Class B TABS position source device

Mode S transponder — standard

1 The Mode S transponder must be of a type that:

(a) is authorised in accordance with (E)TSO-C166B, as in force from time to time; or

(b) approved in writing by CASA as meeting the specifications in RTCA/DO-260B, whether dated 2 December 2009, or a later version as in force from time to time; or

(c) is authorised in writing by CASA as being equivalent to a device mentioned in paragraph (a) or (b).

2 When required to be operated, the Mode S transponder must transmit NACp, NIC, SIL and SDA values in accordance with the authorised capability of the GNSS position source.

GNSS position source equipment

3 The geographical position transmitted by the Mode S transponder must be determined by:

(a) a Class B TABS position source device that is authorised in accordance with (E)TSO-C199, as in force from time to time; or

(b) another source that is authorised in writing by CASA as being equivalent to a source mentioned in paragraph (a).

Altitude source equipment — standard

4 The pressure altitude transmitted by the Mode S transponder must be determined by:

(a) a barometric encoder of a type that is authorised in accordance with (E)TSO-C88a, as in force from time to time; or

(b) another system that is authorised in writing by CASA as being equivalent to a barometric encoder mentioned in paragraph (a).

Appendix XIII — Approved equipment configuration — Integrated TABS device — VFR flight below FL290 only

Part A — ADS-B transmitting equipment — approval and application

Approved equipment configuration — integrated TABS device

1 Subject to this Part, an equipment configuration for ADS-B transmitting equipment is approved if it is an integrated TABS device that complies with the standards specified in Part B of this Appendix.

Application

2 An integrated TABS device carried on an aircraft has an approved equipment configuration if it complies with:

(a) the standards in Part B of this Appendix; and

(b) the conditions set out in clause 3.

Note Another Appendix may apply to the equipment in a VFR flight.

3 For paragraph 2 (b) an integrated TABS device may only be operated in transmitting mode:

(a) in VFR flight below FL290; and

(b) in Class D, Class E or Class G airspace.

Note An integrated TABS device is not a substitute for mandatory carriage of a transponder in relevant airspace, except in Class E airspace, or in Class G airspace above 10 000 ft: see subparagraph 9E.2 (d); see also subparagraph 9BA.6 (b).

Part B — Standards for an integrated TABS device

1 An integrated TABS device must meet the technical specifications in (E)TSO-C199, as in force from time to time, that are for a device with integrated Class A TABS and Class B TABS functionality.

2 An integrated TABS device must transmit a SIL value of 1.

3 Subject to clause 4, an integrated TABS device must be authorised by the relevant NAA of the equipment manufacturer as meeting the standards mentioned in clauses 1 and 2.

4 Clause 3 does not apply to an integrated TABS device carried on certain light sport, experimental and other aircraft provided that the TABS device that is carried:

(a) provides the pilot, other aircraft and ATC with the same transponder and surveillance capability as would be provided if an integrated TABS device were expressly authorised by the relevant NAA; and

(b) the pilot has a statement of compliance (or however described) from the equipment manufacturer certifying that the equipment otherwise meets the standards mentioned in clauses 1 and 2.

Appendix XIV — Approved equipment configuration — EC device — VFR flight below FL290 only

Part A — ADS-B transmitting equipment — approval and application

Approved equipment configuration — EC device

1 Subject to this Part, an equipment configuration for ADS-B transmitting equipment is approved if it is an electronic conspicuity device (an ***EC device***) that complies with the standards specified in Part B of this Appendix.

Note Only EC devices that meet all of the requirements of this Appendix are EC devices for the purposes of this Appendix.

Application

2 An EC device carried on an aircraft has an approved equipment configuration if it complies with:

(a) the standards in Part B of this Appendix; and

(b) the conditions set out in clause 3.

Note Another Appendix may apply to the equipment in a VFR flight.

3 For paragraph 2 (b), an EC device must not be operated in transmitting mode:

(a) in VFR flight at or above FL290; or

(b) concurrently with a Mode S transponder that is also transmitting ADS-B.

Note An EC device may be operated concurrently with a Mode A/C, or a Mode S transponder (other than one that is transmitting ADS-B) but it is not a substitute for mandatory carriage of a transponder in relevant airspace.

Part B — Standards for an EC device

1 Subject to clauses 3 and 4, an EC device must meet the technical specifications in UK CAP 1391.

2 An EC device must use a Class B TABS position source that complies with the performance standards specified in (E)TSO-C199, as in force from time to time.

3 An EC device must:

(a) be capable of transmitting a SIL value of 1, in accordance with the standards in UK CAP 1391 for an EC device that uses a Class B TABS position source; and

(b) transmit that SIL value of 1.

4 Despite the standards in UK CAP 1391, an EC device must:

(a) meet the requirements described in paragraph 2.2.3.2.7.2.4.6 of RTCA/DO-260B for transmitting an SDA of 1; and

(b) transmit an SDA value of 1.

5 An EC device must use a barometric encoder for altitude information.

6 An EC device must be mounted in accordance with the manufacturer's instructions.

7 An EC device, when mounted in accordance with the manufacturer's instructions, must not:

(a) interfere with aircraft controls; or

(b) otherwise affect the safe operation of the aircraft.

8 The following administrative standards for an EC device must be complied with:

Note See Subparagraph 9B.3 (b).

(a) an EC device must have a statement of compliance (however described) from the EC device manufacturer certifying that the device meets the requirements mentioned in clauses 1 to 5 (***a declaration of capability and conformance to the requirements in clauses 1 to 5*** or ***a declaration***);

(b) the pilot in command of an aircraft that uses an EC device must carry the declaration, or a copy of it, on board the aircraft;

(c) an EC device model must not be operated in a transmit mode anywhere in Australia unless it is listed on the CASA website as an EC device model for which the manufacturer has made a valid declaration;

(d) the manufacturer of an EC model may apply in writing to CASA:

(i) for a statement that CASA considers that the manufacturer has made a valid declaration of capability and conformance to clauses 1 to 5 of Part B of Appendix XIV of Civil Aviation Order 20.18; and

(ii) for inclusion of the EC device model on the CASA website.

(e) CASA may remove an EC device model from the CASA website if:

(i) the manufacturer requests its removal in writing; or

(ii) if CASA is satisfied that removal is required in the interests of aviation safety.

Notes to *Civil Aviation Order 20.18 (Aircraft equipment — basic operational requirements) Instrument 2014*

The Civil Aviation Order (in force under the *Civil Aviation Regulations 1988*) as shown in this compilation comprises *Civil Aviation Order 20.18 (Aircraft equipment — basic operational requirements) Instrument 2014* amended as indicated in the Tables below.

Table of Orders

Year and number	Date of registration on FRLI/FRL	Date of commencement	Application, saving or transitional provisions
CAO 20.18 Instrument 2014	17 December 2014 (F2014L01743)	17 December 2014 (s. 1B)	—
CAO 20.18 Am Instrument 2015 (No. 1)	FRLI 17 March 2015 (F2015L00311)	18 March 2015 (s. 2).	s. 4 (see Table A)
CAO 20.18 Am Instrument 2015 (No. 2)	FRLI 29 April 2015 (F2015L00605)	S. 2: 29 April 2015 Remainder: 1 January 2016	—
CAO 20.18 Am Instrument 2016 (No. 2)	FRL 15 December 2016 (F2016L01961)	16 December 2016 (s. 2).	—
Civil Aviation Legislation Amdt & Repeal (ATSOs) Instrument 2017	FRL 30 November 2017 (F2017L01553)	30 November 2017 (s. 2)	—
CAO 20.18 Am Instrument 2020 (No. 1)	FRL 11 June 2018 (F2020L00693)	11 June 2020 (s. 2)	—

Table of Amendments

ad. = added or inserted am. = amended rep. = repealed rs. = repealed and substituted

Provision affected	How affected
subs. 1B	rep. *Legislation Act 2003*, s. 48D
subs. 1C	rep. *Legislation Act 2003*, s. 48C
subs.3	am. F2015L00605
subs. 4	am. F2015L00605
subs. 9	am. F2020L00693
subs. 9B	am. F2016L01961, F2017L01553, F2020L00693
subs. 9BA	ad. F2020L00693
subs. 9C	am. F2016L01961, F2020L00693
subs. 9D	am. F2016L01961
subs. 9E	am. F2016L01961, F2020L00693
Appendix XI	am. F2017L01553, F2020L00693
Appendix XII	ad. F2020L00693
Appendix XIII	ad. F2020L00693

Table of Amendments

ad. = added or inserted am. = amended rep. = repealed rs. = repealed and substituted

Provision affected	How affected
Appendix XIV	ad. F2020L00693

Table A

Civil Aviation Order 20.18 Amendment Instrument 2015 (No. 1) (F2015L00311)

4 Transitional application — helicopter V.F.R. operations at night

The amendments to Civil Aviation Order 20.18 in Schedule 1 of this instrument do not apply until 1 January 2016.

The amendments referred to in the **Transitional application — helicopter V.F.R. operations at night** provision are set out below:

Amendments

[1] Paragraph 3.2

after

the V.F.R.

insert

by day

[2] After paragraph 3.2

Insert

3.2A A helicopter may only be operated under the V.F.R. at night if:

(a) it is equipped with the instruments specified in Appendix VIII; and

(b) it is equipped with any other instruments and indicators specified in the helicopter's flight manual;

(c) for flights under V.F.R. at night which involve flights over land or water where the helicopter's attitude cannot be maintained by the use of visual external surface cues as a result of lights on the ground or celestial illumination:

(i) the helicopter is equipped in accordance with subparagraph 4.2 (d) of this Order; or

(ii) the helicopter is operated by a qualified 2 pilot crew, each with access to flight controls.

[3] Subparagraph 4.2 (d)

substitute

(d) an approved automatic pilot or automatic stabilisation system.

Australian Government

Civil Aviation Safety Authority

Civil Aviation Amendment Order (No. R25) 2004 as amended

made under subregulation 150 (2) of the *Civil Aviation Regulations 1988*.

This compilation was prepared on 15 January 2015 taking into account amendments up to *Civil Aviation Order (Flight Crew Licensing) Repeal and Amendment Instrument 2014 (No. 1)*.

Prepared by the Legislative Drafting Section, Legal Branch, Legal Services Division, Civil Aviation Safety Authority, Canberra.

1 Name of Order

This Order is the Civil Aviation Amendment Order (No. R25) 2004.

2 Commencement

This Order commences on gazettal.

3 Replacement of section 29.5 of the Civil Aviation Orders

Section 29.5 of the Civil Aviation Orders is omitted and a new section substituted as set out in Schedule 1.

Schedule 1 Substitution of section 29.5 of the Civil Aviation Orders

Section 29.5

Air service operations — miscellaneous dropping of articles from aircraft in flight

1 Application

This section applies to all Australian aircraft except those aircraft engaged in aerial application operations or aerial application training operations.

1A Definitions

In this Order:

aerial application operation has the meaning given by regulation 61.010 of the *Civil Aviation Safety Regulations 1998*.

aerial application training operation means flight training for aerial application operations.

2 Directions relating to dropping of articles

2.1 This subsection deals with directions for the purposes of paragraph 150 (2) (a) of the *Civil Aviation Regulations 1988*.

2.2 In respect of dropping for the purposes of cloud seeding or search and rescue operations, the directions set out in subsections 4 and 5 apply.

2.3 In respect of dropping for the purposes of search and rescue training operations, the directions set out in subsections 3, 4 and 5 apply.

2.3.1 In respect of the release of liquid fuel, the directions set out in subsection 8 apply.

2.4 In respect of dropping for purposes other than those mentioned in paragraphs 2.2, 2.3 and 2.3.1, the directions set out in subsections 3, 4, 5 and 7 apply.

Note 1 The directions specified in this Order do not confer any rights as against the owner of any land over which the operations may be conducted, or prejudice in any way the rights and remedies which any person may have in common law in respect of any injury to persons or damage to property caused directly or indirectly during the operations.

3 Dropping site

Dropping shall not be carried out within a control zone, within an aircraft lane of entry, or within 5 miles of a Government or licensed aerodrome, without the approval of CASA.

4 Dropping requirements

4.1 The articles or substances shall be carried inside the aircraft or in a manner specified in the flight manual or otherwise approved by CASA.

4.2 The opening through which the articles or substances are dropped shall be located so that the articles or substances, on release, will not damage or affect the operation of any part of the aircraft.

4.3 The size to weight ratio of individual articles shall be such that they will drop readily away from the aircraft.

4.4 For articles other than leaflets or substances not in the form of liquid, powder or fine grains, the dropping site shall be of such dimensions that there is no risk of the articles or substances falling outside the site.

4.5 Articles, other than leaflets or substances not in the form of liquids, powder or fine grains, shall not be dropped on a site unless it is clear of persons and stock.

4.6 The size of the leaflets and the number dropped at any one time shall be limited to an extent which will ensure that injury is not caused to persons on the ground if the leaflets fail to separate while dropping.

4.7 The dropping of articles or substances shall be controlled by a person other than the pilot in command (hereinafter referred to as the despatcher), unless the dropping can be carried out by the pilot in command from his normal crew station and without affecting his ability to control the aircraft normally.

4.8 Effective communication shall be maintained between the pilot in command and the despatcher during the dropping operation and the articles or substances shall be dropped only with the consent of the pilot in command.

Note In this Order, ***dropping operation*** means that part of the flight during which the aircraft is on the final approach path to the dropping site or target, and during which only minor changes of heading, airspeed and altitude are made.

4.9 The pilot in command shall ensure that movement of articles or substances during flight preparatory to dropping, during the dropping and after the dropping will not result in any change in aircraft trim that could cause an

unsafe condition or cause the aircraft's centre of gravity to move outside permissible limits.

4.10 The operator shall ensure that the despatcher is properly instructed in his duties.

4.11 The pilot in command must be authorised under Part 61 of the *Civil Aviation Safety Regulations 1998* to conduct the activity.

5 Carriage of articles and persons

5.1 The carriage of articles or substances prior to dropping shall be in accordance with section 20.16.2.

5.2 Except with the permission of CASA, no person other than the persons having duties relating to the operation shall be carried in an aircraft engaged in operations during which dropping is carried out.

5.3 During dropping operations, each person on board except despatchers shall occupy a separate seat equipped with an approved safety belt or harness which shall be worn adjusted to ensure adequate restraint.

5.4 Where the dropping aperture is large enough for a person to fit through, all occupants except despatchers shall remain seated whenever the aperture is open.

5.5 A despatcher need not be provided with a seat but a position where he may sit shall be provided and equipped with an approved safety belt or harness.

5.5.1 A despatcher shall remain seated and wear a safety belt or harness adjusted to ensure adequate restraint:

(a) during take-off and landing; and

(b) during an instrument approach.

5.5.2 Except during dropping operations a despatcher shall remain seated and wear a safety belt or harness adjusted to ensure adequate restraint:

(a) in turbulent conditions; and

(b) when the aircraft is flying at a height of less than 100 feet above the terrain.

5.6 A despatcher shall wear approved restraint equipment during dropping operations and this equipment may permit him to move to but not through the dropping aperture.

6 Low flying permit

6.1 Subject to subsection 7 and pursuant to paragraph 157 (4) (b) of the *Civil Aviation Regulations 1988*, CASA grants a general permit:

(a) to each owner and operator of an aeroplane that is engaged in private, or aerial work, operations that require low flying (being dropping operations associated with search and rescue training) to fly at a height not lower than 100 feet during such operations; and

(b) to each owner and operator of an aircraft (other than an aeroplane) that is engaged in private, or aerial work, operations, being:

(i) dropping operations associated with search and rescue training; or

(ii) other dropping operations or practice for such operations;

to fly at a height lower than 500 feet during such operations over any area that is not a populous area.

7 Operating conditions

7.1 An aircraft must not fly over any populous area at a height lower than 1 000 feet above the terrain, unless a flight at a lower height is essential to the efficient conduct of a dropping operation and such an operation is occasioned by an emergency.

7.2 Except with the permission of CASA, dropping operations shall be conducted by day only, in accordance with visual flight rules, and in continuous sight of the ground or water.

8 Directions relating to the release of liquid fuel

8.1 If paragraph 150 (2) (d) of the *Civil Aviation Regulations 1988* does not apply, a pilot in command may only release fuel in accordance with the *Air Navigation (Fuel Spillage) Regulations 1999*.

Notes to Civil Aviation Order 29.5

Note 1

The Civil Aviation Order (in force under the *Civil Aviation Regulations 1988*) as shown in this compilation comprises Civil Aviation Order 29.5 amended as indicated in the Tables below.

Table of Orders

Year and number	Date of notification in *Gazette*/ registration on FRLI	Date of commencement	Application, saving or transitional provisions
CAO 2004 No. R25	8 December 2004 (F2005B00836)	8 December 2004 (s. 2)	
CAO (Flight Crew Licensing) Repeal and Amendment Instrument 2014 (No. 1)	FRLI 29 August 2014 (F2014L01177)	1 September 2014 (s. 2)	Sections 3 and 31 (Table A)

Table of Amendments

ad. = added or inserted am. = amended rep. = repealed rs. = repealed and substituted

Provision affected	How affected
s. 29.5	rs. CAO 2004 No. R25
subs. 1	rs. F2014L01177
subs. 1A	ad. F2014L01177
subs. 4	am. F2014L01177
subs. 7	am. F2014L01177
Appendix I	rep. F2014L01177

Table A Application, saving or transitional provisions

Sections 3 and 31 of Civil Aviation Order (Flight Crew Licensing) Repeal and Amendment Instrument 2014 (No. 1) read as follows:

3 Definitions

(1) In this instrument:

continued authorisation has the meaning given by regulation 202.261 of the *Civil Aviation Safety Regulations 1998* (***CASR 1998***).

new authorisation has the meaning given by regulation 202.261 of CASR 1998.

(2) A reference in this instrument to a Civil Aviation Order identified by a specified number is taken to include a reference to the section of the Civil Aviation Orders with that number.

Note Some existing legislative instruments are referred to as a Civil Aviation Order followed by a number. Other instruments are referred to as a section of the Civil Aviation Orders. For

consistency, in this instrument, all such instruments are referred to as a Civil Aviation Order followed by a number. For example, a reference to Civil Aviation Order 40.2.2 is taken to include a reference to section 40.2.2 of the Civil Aviation Orders.

31 Transitional — application of Civil Aviation Orders

The Civil Aviation Orders apply to a continued authorisation as if it were the equivalent new authorisation.

Australian Government

Civil Aviation Safety Authority

Civil Aviation Order 48.1 Instrument 2019
(as amended)

made under subregulation 5 (1), regulation 210A and subregulation 215 (3) of the *Civil Aviation Regulations 1988*, subregulation 11.068 (1) of the *Civil Aviation Safety Regulations 1998*, and paragraph 28BA (1) (b) and subsection 98 (4A) of the *Civil Aviation Act 1988*.

This compilation was prepared on 2 December 2021 taking into account amendments up to *Civil Aviation Order 48.1 Amendment Instrument 2021 (No. 1)*. It is a compilation of *Civil Aviation Order 48.1 Instrument 2019* as amended and in force on 2 December 2021.

Prepared by the Advisory and Drafting Branch, Legal, International and Regulatory Affairs Division, Civil Aviation Safety Authority, Canberra.

Compilation No. 3

Contents

Note This Table of Contents is not part of *Civil Aviation Order 48.1 Instrument 2019*. It is for reader guidance only. The Table may be modified or edited in any published version of the Instrument. See paragraph 1.2 in Part 1.

PART 1 GENERAL

1 Name of instrument

1.1 This instrument is the *Civil Aviation Order 48.1 Instrument 2019*.

1.2 The Table of Contents at the front of this instrument is not part of this instrument. It is for guidance only and may be modified or edited in any published version of this instrument.

4 Application

4.1 Subject to paragraph 4.2, this CAO applies on and from 2 December 2021 to each of the following:

(a) subject to subparagraph (b), an AOC, other than a foreign air transport AOC;

Note The expression "foreign air transport AOC" and the related expression "foreign air transport operation" are defined in the CASR Dictionary. See Part 129 of CASR.

(b) except when subsection 11 applies — an AOC which covers application operations under Part 137 of CASR;

(c) a Part 138 certificate;

(d) a Part 141 certificate;

(e) a flight crew member employed by the holder of an AOC or a certificate to which subparagraph (a), (b), (c), or (d) applies;

(f) for the purposes of subsection 16 — a flight crew member mentioned in that subsection;

(g) a flight crew member on a flight conducted as a private operation.

4.2 Without affecting paragraph 4.4, this CAO does not apply to any of the following:

(a) a Part 141 operator for authorised Part 141 flight training;

(b) a Part 142 operator for authorised Part 142 activity;

(c) an FCM of an operator mentioned subparagraph (a) or (b);

if the flight training or the activity is conducted in a flight simulation training device as the sole and exclusive form of training or activity conducted by the operator under the authorisation.

Note The CAO will apply to a person mentioned in subparagraph (a) or (b), and hence apply to a person mentioned in subparagraph (c), if any training or activity involves operations in an aircraft.

4.3 Subject to paragraph 4.4, this CAO sets out:

(a) for paragraph 28BA (1) (b) of the Act — conditions on each AOC mentioned in subparagraphs 4.1 (a) and (b); and

(b) for subregulation 11.068 (1) of CASR, conditions on each of the following:

(i) each Part 138 certificate mentioned in subparagraph 4.1 (c);

(ii) each Part 141 certificate mentioned in subparagraph 4.1 (d);

Note Conditions on an AOC are imposed under paragraph 28BA (1) (b) of the Act. Conditions on a Part 141 certificate or a Part 138 certificate are imposed under subregulation 11.068 (1) of CASR.

(c) for subregulation 11.068 (1) of CASR — conditions on the flight crew licence of each flight crew member mentioned in subparagraphs 4.1 (e), (f) and (g).

4.4 The condition set out in paragraph 16.1 applies to the holder of a flight crew licence whether or not the person is employed by the holder of an AOC or a Part 138, Part 141,or Part 142 certificate mentioned in paragraph 4.1 or 4.2.

Note Under regulation 11.077 of CASR, it is an offence for a person holding a flight crew licence to contravene a condition of the licence.

5 When the CAO takes effect

5.1 Without affecting this CAO as in force immediately before 2 December 2021, this CAO takes effect:

(a) for an operator who holds an AOC or certificate mentioned in paragraph 4.1 — on and from 2 December 2021; and

(b) for a person who is issued with an AOC or certificate mentioned in paragraph 4.1 — on and from the day the AOC or certificate is issued; and

(c) for a flight crew member of an operator or person mentioned in subparagraph (a) or (b) — on and from the day mentioned in subparagraph (a) or (b) for the operator or person; and

(d) for a flight crew member on a flight conducted as a private operation — on and from 2 December 2021.

5.2 Each flight crew member of an operator or person mentioned in paragraph 5.1 must comply with the applicable requirements of this CAO that apply to, and take effect for, the operator or person in accordance with this subsection.

5A Approval of non-compliance

5A.1 CASA may, on application or on its own initiative, by instrument in writing, approve limited or minor non-compliance with the requirements of a specified provision of this CAO.

5A.2 An approval has the effect that the specified provision of this CAO does not apply to the AOC holder to whom the approval applies, provided that any conditions expressed in the approval are complied with.

Note The expression AOC holder includes the holder of a Part 138 certificate or a Part 141 certificate: see the definition of ***AOC holder*** in subsection 6.

5A.3 An approval mentioned in paragraph 5A.2 has the effect that the specified provision of this CAO does not apply to the AOC holder's flight crew members.

5A.4 CASA must not grant an approval unless CASA is satisfied that compliance with the approval, including any conditions of the approval, will preserve an acceptable level of aviation safety.

5A.5 An instrument of approval is a legislative instrument if the instrument is expressed to apply to a class of AOC holders.

5A.6 An instrument of approval is not a legislative instrument if the instrument is expressed to apply to a particular AOC holder.

6 Definitions

6.1 In this CAO:

access, in a provision referring to 1 or more of the following (***necessities***):

(a) a crew rest facility;

(b) suitable sleeping accommodation;

(c) suitable resting accommodation;

(d) adequate sustenance;

means that there is no restriction on, or impediment to, a flight crew member's immediate and actual use of the necessity:

(e) in accordance with the provision; or

(f) if the provision is a definition — in accordance with a provision which uses the defined term.

acclimatised has the meaning given in subsection 7.

acclimatised time means local time at the location where an FCM is acclimatised.

Act means the *Civil Aviation Act 1988*.

adaptation period means a continuous off-duty period for an FCM to become acclimatised to a particular location.

adequate sustenance means food and drink, including clean drinking water, in quantities sufficient to reasonably sustain a person in the person's circumstances.

aerial work certificate means a certificate issued under regulation 138.040 of CASR.

aerial work operator has the meaning given by the CASR Dictionary.

Note An aerial work operator is the holder of an aerial work certificate.

AOC means an Air Operator's Certificate.

AOC holder, or ***holder***, means the holder of an Air Operator's Certificate issued under Part III, Division 2 of the Act but, except in subsection 4, is also taken to include the holder of one of the following to whom this CAO applies:

(a) a Part 138 certificate;

(b) a Part 141 certificate.

Note See also paragraph 6.5.

approval means approval in writing.

assigned means assigned by the AOC holder to his or her FCM.

Note For example, the AOC holder ***assigns*** to the FCM ***duty***, ***standby***, a ***home base***, a ***flight duty period***, a ***reporting time***.

augmented crew operation means an aircraft operation in which 1 or more FCMs, additional to the minimum required number of FCMs, are engaged in a flight to allow 1 or more FCMs to be relieved of duty during flight time.

authorised Part 141 flight training has the same meaning as in subregulation 141.015 (2) of CASR but does not include flight training that is conducted in a flight simulation training device as the sole and exclusive form of training conducted by the operator.

authorised Part 142 activity has the same meaning as in subregulation 142.015 (3) of CASR but does not include flight training that is conducted in a flight simulation training device as the sole and exclusive form of training conducted by the operator.

bed, for suitable sleeping accommodation, includes at least 1 pillow, clean bed linen, and bed covering appropriate for the temperature of the accommodation.

call out means being required by an AOC holder to commence a duty period during a standby.

CAR means the *Civil Aviation Regulations 1988*.

CASR means the *Civil Aviation Safety Regulations 1998*.

Chief Executive Officer means the person who is:

(a) if the AOC holder is an individual — that individual; or

(b) if the AOC holder is a corporation — the person (however described) whom CASA was satisfied, for subparagraph 28 (1) (b) (iv) of the Act (and the definition of ***key personnel*** in subsection 28 (3) of the Act), could hold or carry out the duties of the AOC holder's Chief Executive Officer.

complex operation means an operation which involves 1 or more of the following:

(a) an FDP with a displacement time of 2 hours or more;

(b) an augmented crew operation;

(c) an FDP that commences when the FCM is:

(i) in an unknown state of acclimatisation; or

(ii) acclimatised to a location other than the location where the FDP commences.

Note AOC holders should consider the impact of Daylight Saving Time on local time differences for relevant locations because Daylight Saving Time may have an impact on whether or not an operation is complex.

consecutive, in relation to the hours or days of a period of time mentioned in a provision of this CAO, means a continuous, unbroken, period of time for the duration of the hours or days mentioned.

crew member has the meaning given by the CASR Dictionary.

crew rest facility means 1 of the following defined classes of facility on board an aircraft that is available to an FCM:

(a) ***class 1***, which means a bunk or other surface that:

(i) is fit for the purpose of an FCM obtaining sleep in a horizontal sleeping position; and

(ii) is located separate from both the flight deck and passenger compartment in an area that:

(A) is temperature-controlled; and

(B) allows the FCM to control light; and

(C) provides isolation from noise and disturbance;

(b) ***class 2***, which means a seat in an aircraft cabin that:

(i) is fit for the purpose of an FCM obtaining sleep in a horizontal or near-horizontal sleeping position; and

(ii) is separated from passengers by at least a curtain that provides darkness and some noise mitigation; and

(iii) is reasonably free from disturbance by passengers or crew members;

(c) ***class 3***, which means a seat in an aircraft cabin or flight deck that:

(i) is fit for the purpose of an FCM obtaining rest; and

(ii) reclines at least 40 degrees from the vertical plane; and

(iii) provides leg and foot support in the reclined position.

cruise means the period of a flight from not less than 30 minutes after take-off until not less than 60 minutes before the estimated time of landing.

cumulative duty means the progressive sum of duty periods.

cumulative flight time, for an FCM, means the progressive total of flight time accrued by the FCM when acting as a crew member on board any aircraft, but excluding flight time accrued during recreational private operations.

day means the period between local midnight at home base and the subsequent local midnight at home base.

displacement time means the difference in local time between:

(a) the place where an FCM commenced an FDP; and

(b) the place where the FCM undertakes an off-duty period following the FDP.

duty means any task that a person who is employed as an FCM is required to carry out associated with the business of an AOC holder.

duty period means a period of time which:

(a) starts when an FCM is required by an AOC holder to report for duty; and

(b) ends when the FCM is free of all duties.

Note A duty period includes any time spent by the FCM in positioning. See the definition of ***positioning*** in subparagraph 6.3 (e).

early start, for an FDP of an FCM, means:

(a) in Appendix 2:

(i) if the FCM is acclimatised — an FDP that commences between the hours of 0500 and 0659 local time at the location where the FCM is acclimatised; or

(ii) if the FCM is in an unknown state of acclimatisation — an FDP that commences between the hours of 0500 and 0659 local time at the location where the FCM was last acclimatised; and

(b) for an Appendix other than Appendix 2 — an FDP that commences between the hours of 0500 and 0659 local time at the location where an FCM commences the FDP.

emergency service operation means an operation involving an aircraft:

(a) for the purpose of law enforcement, or saving or protecting life or property; and

(b) conducted by, or at the request of, an organisation recognised by an Australian governmental agency as having responsibility to conduct or request the operation as part of the organisation's functions.

employment includes employment under a contract for services.

fatigue, for an FCM, means a physiological state of reduced alertness or capability to perform mental or physical tasks, which:

(a) may impair the ability of the FCM to safely operate an aircraft; and

(b) is caused by 1 or more of the following:

(i) the FCM's lack of sleep;

(ii) the FCM's extended wakefulness;

(iii) the FCM's circadian phase at any relevant time;

(iv) the FCM's workload of mental activities, or physical activities, or mental and physical activities at any relevant time.

fatigue risk management system (or ***FRMS***) means a comprehensive system for managing fatigue-related risks that:

(a) is appropriate for the size, nature and complexity of the AOC holder's operations; and

(b) includes all of the elements set out in Appendix 7; and

(c) is approved for implementation by CASA.

fit for the purpose, for a crew rest facility, or suitable sleeping accommodation, means that the facility, or accommodation, has ergonomic characteristics which make it suitable for an FCM to obtain sleep or rest, as the case requires.

Note CASA has issued guidance on relevant ergonomic characteristics in CAAP 48-01.

flight crew licence has the meaning given by the CASR Dictionary.

flight crew member (or ***FCM***) has the same meaning as in the Regulations. The abbreviation ***FCMs*** means more than 1 FCM.

Note Under Part 1 of the CASR Dictionary, ***flight crew member*** means a crew member who is a pilot or flight engineer assigned to carry out duties essential to the operation of an aircraft during flight time. Any reference to ***flight crew*** has a corresponding meaning.

flight duty period (or ***FDP***) means a period of time which:

(a) starts when a person is required by an AOC holder to report for a duty period in which 1 or more flights as an FCM are undertaken; and

(b) ends at the later of:

(i) the person's completion of all duties associated with the flight, or the last of the flights; or

(ii) 15 minutes after the end of the person's flight, or the last of the flights.

Note See also the definition of ***positioning***.

flight review has the same meaning as in regulation 61.010 of CASR.

Note ***Flight review*** means an assessment of the competency of an FCM to perform:

(a) for the holder of a pilot licence or flight engineer licence — an activity authorised by a flight crew rating that the crew member holds; or

(b) for the holder of a glider pilot licence — an activity authorised by the licence.

flight time, for an FCM, means such part of the total time mentioned for an aircraft in subparagraph (a) or (b) (as the case may be) which occurs while the FCM is acting as a crew member on board the aircraft:

(a) in the case of a heavier-than-air aircraft — the total time from the moment at which the aircraft first moves under its own power for the purpose of taking-off, until the moment at which it comes to rest after landing; and

(b) in the case of a lighter-than-air aircraft — the total time from the moment at which the aircraft first becomes airborne until it comes to rest on the ground, excluding any time during which the aircraft is moored.

Note Thus, flight time for an FCM does not include the time he or she spends in positioning.

flight training has the same meaning as in regulation 61.010 of CASR and, to avoid doubt, includes flight training associated with aerial work.

Note ***Flight training***, for a flight crew licence, rating or endorsement, means the training mentioned in regulation 61.195 of CASR for the licence, rating or endorsement.

flight training associated with aerial work means flight training for the grant, under Part 61 of CASR, of a rating or endorsement mentioned in subparagraph (a), (b), (c) or (d):

(a) the following operational ratings:

(i) low-level rating;

(ii) aerial application rating;

(iii) night vision imaging system rating;

(b) endorsements for the following operational ratings:

(i) low-level rating;

(ii) aerial application rating;

(iii) night vision imaging system rating;

(c) the following endorsements on the flight instructor rating:

(i) low-level rating training endorsement (category specific);

(ii) aerial application rating (day) training endorsement (category specific);

(iii) aerial application rating (night) training endorsement (category specific);
(iv) night vision imaging system rating training endorsement;
(v) sling operations training endorsement;
(vi) winching and rappelling operations training endorsement;

(d) the following endorsements on the flight examiner rating:
(i) low-level rating flight test endorsement (category specific);
(ii) aerial application rating flight test endorsement (category specific);
(iii) night vision imaging system rating flight test endorsement.

FRMS Manager means the person in an AOC holder's organisation who is appointed by the Chief Executive Officer to be responsible for the day-to-day implementation, management and continuing effectiveness of the AOC holder's FRMS.

home base means the location, assigned by the AOC holder to the FCM, from where the FCM normally starts and ends a duty period or a series of duty periods.

in-flight rest means, in an augmented crew operation, the period of time, or periods of time, during which an FCM has access to a crew rest facility.

late-night operation means an operation where an FDP includes more than 30 minutes between the hours of 2300 and 0530 local time.

local night means a period of 8 consecutive hours which includes the hours between 2200 and 0500 local time.

local time, for a location, means:

(a) local time in the time zone of the location; or

(b) local time in a time zone (the ***alternative local time***):
(i) that adjoins the time zone of the location; and
(ii) whose nearest boundary is reasonably proximate to the location;
provided the alternative local time is:
(iii) specified in the AOC holder's operations manual; and
(iv) used consistently as local time for the location, for the purposes of this CAO.

Note 1 CASA considers an alternative time zone to be used consistently as local time for a location if it is used, for example, throughout a period of daylight saving in the location or the adjoining time zone.

Note 2 Examples of where an AOC holder may consider using alternative local time are as follows:

Local time	Alternative local time
Gold Coast airport, Queensland summertime	NSW
Kununurra airport, Western Australia	NT

medical personnel means a person with medical, paramedical or nursing qualifications, and responsibilities directly related to the qualifications.

medical transport operation means an aircraft operation consisting of 1 or more flights for any of the following purposes:

(a) delivery of urgent medical assistance to a person, when determined to be necessary by a medical transport tasker;

(b) transportation of any of the following, when determined to be necessary by a medical transport tasker:

(i) an ill or injured person;

(ii) another person directly involved with the person mentioned in sub-subparagraph (i);

Note For example, a close relative or the police.

(iii) medical personnel intended to be, or who are, directly involved with the person mentioned in sub-subparagraph (i);

(iv) blood, tissue or an organ for transfusion, grafting or transplantation (an ***item***), including a person who has authorised custody of the item;

(c) the return of the aircraft to its base because an operation mentioned in subparagraph (a) or (b) is completed.

medical transport tasker means:

(a) medical personnel; or

(b) an organisation whose purpose is, or whose purposes include, medical transport tasking.

multi-pilot operation:

(a) means an aircraft operation conducted under multi-pilot procedures contained in the AOC holder's operations manual; but

(b) does not include:

(i) contracted checking, within the meaning of regulation 142.020 of CASR; or

(ii) contracted recurrent training within the meaning of regulation 142.020 of CASR;

unless the training or checking is conducted as a multi-crew operation within the meaning of regulation 61.010 of CASR.

mustering operation means an aerial work operation, by a Part 138 operator, to herd or otherwise control livestock, and includes the following:

(a) aerial livestock spotting;

(b) aerial humane killing of livestock that is injured or being culled;

(c) flight training associated with aerial work for any of the activities mentioned in this definition.

off-duty period means a period of time during which an FCM is free of all duties and standby associated with his or her employment.

operator proficiency check has the same meaning as in regulation 61.010 of CASR.

Note An ***operator proficiency check*** means an assessment conducted by an operator in accordance with its training and checking responsibilities under the Regulations of whether a person has the aeronautical skills and knowledge required by the operator.

Part 138 certificate means an aerial work certificate issued under regulation 138.040 of CASR.

Part 138 operator means the holder of a Part 138 certificate.

Part 141 certificate means the Part 141 certificate of a Part 141 operator to whom this CAO applies and, to that extent only, has the same meaning as in subregulation 141.015 (4) of CASR.

Note See also paragraph 4.2 which excludes from the scope of the CAO a Part 141 operator whose training is conducted exclusively through the use of a flight simulation training device. In

subregulation 141.015 (4) of CASR, a ***Part 141 certificate*** is defined as a certificate issued under regulation 141.060 of CASR. Except in paragraph 2.2, and subsections 4 and 4B, a reference in this CAO to an AOC holder is taken to include a Part 141 operator: see paragraph 6.4.

Part 141 operator means a Part 141 operator to whom this CAO applies and, to that extent only, has the same meaning as in subregulation 141.015 (3) of CASR.

Note See also paragraph 4.2 which excludes from the scope of the CAO a Part 141 operator whose training is conducted exclusively through the use of a flight simulation training device. In subregulation 141.015 (3) of CASR, a ***Part 141 operator*** is defined as the holder of a Part 141 certificate. Except in paragraph 2.2, and subsections 4 and 4B, a reference in this CAO to an AOC holder is taken to include a Part 141 operator: see paragraph 6.4.

Part 142 operator means a Part 142 operator to whom this CAO applies and, to that extent only, has the same meaning as in subregulation 142.015 (4) of CASR.

Note See also paragraph 4.2 which excludes from the scope of the CAO a Part 142 operator whose activity is conducted exclusively through the use of a flight simulation training device.

positioning is defined in paragraph 6.3.

private operation has the meaning given by the CASR Dictionary.

reassign means to assign to an FCM in a modified form that which had previously been assigned to the FCM.

recreational private operation means flying conducted by an FCM in a personal capacity, and at and for the FCM's leisure.

Note A flight conducted by an FCM as a private operation is not a recreational private operation if it is conducted for, or on behalf of, an entity, regardless of whether or not the entity is an AOC holder.

reporting time means the time assigned to an FCM to commence an FDP.

roster means a list made available to an FCM by an AOC holder setting out the times when the FCM is assigned to undertake duties or standby.

sector, for this CAO, has the following meanings:

(a) except for a rotorcraft — any flight consisting of a take-off and a landing, when conducted by a person in the capacity of an FCM;

(b) for a rotorcraft — the period:

  (i) from when the rotor blades start turning until they stop turning; and

  (ii) during which an FCM on the rotorcraft conducts 1 or more flights, each consisting of a take-off and a landing;

(c) each hour, or each part of an hour, of an FDP spent in a synthetic training device.

single-pilot operation means any operation other than a multi-pilot operation.

sleep opportunity means a period of time during an off-duty period when an FCM:

(a) is not meeting the reasonable requirements of bodily functioning such as eating, drinking, washing or dressing; and

(b) has access to suitable sleeping accommodation without, under normal circumstances, being interrupted by any requirement of the AOC holder.

Note When an FCM is interrupted during sleep opportunity, this may affect the FCM's fitness for duty before the commencement of, or during, the next FDP.

SMS means a safety management system approved by CASA.

split duty means an FDP which contains a split-duty rest period.

split-duty rest period means a predefined period of time (or, for Appendix 4B or Appendix 5, a period of time that may or may not be predefined) during which an FCM:

(a) has access to suitable resting accommodation or suitable sleeping accommodation; and

(b) is relieved of all duties associated with his or her employment by the AOC holder.

standby means a period of time during which an FCM:

(a) is required by an AOC holder to hold himself or herself available for duties; and

(b) has access to suitable sleeping accommodation; and

(c) is free from all duties associated with his or her employment.

Note If suitable sleeping accommodation is not available for an FCM, who is required by an AOC holder to hold himself or herself available for duty, the FCM will be considered to be on duty and not on standby.

standby-like arrangement means a period of time during which an FCM:

(a) is required by an AOC holder to hold himself or herself available for duties; and

(b) has no access to suitable sleeping accommodation.

suitable resting accommodation means a comfortable resting area:

(a) which has a comfortable temperature and minimal noise levels; and

(b) which contains at least a comfortable chair; and

(c) at which the FCM has access to adequate sustenance at times appropriate to the duty requirements.

Note Suitable resting accommodation is solely for split-duty rest periods. Suitable sleeping accommodation may also be used for split-duty rest periods.

suitable sleeping accommodation means accommodation, not within an aircraft, that is fit for the purpose of an FCM obtaining sleep, and that includes the following:

(a) a comfortable room, compartment or facility;

(b) a single occupancy, at the discretion of the FCM;

(c) access to clean, tidy and hygienic amenities, including a toilet and hand washing basin;

(d) a bed that is comfortable, flat and horizontal, allowing the occupant to sleep on his or her stomach, and back, and either side;

(e) minimum noise levels, including low occurrence of random noise;

(f) the means to control light, temperature and ventilation;

(g) access to adequate sustenance.

Note A person's home or residence is considered to meet the requirements of ***suitable sleeping accommodation***.

synthetic training device has the same meaning as in the Regulations.

Note Under the Dictionary in CASR, ***synthetic training device*** means a flight simulator, a flight training device, or a basic instrument flight trainer.

the Regulations means CAR and CASR, as in force from time to time.

Note The effect of regulation 2C is that ***the Regulations***, CAR and CASR, are to be read together.

time zone means a defined region of the earth with a uniform local time which differs by 1 hour, or by part of 1 hour, from the uniform local time of an adjoining region of the earth.

unforeseen operational circumstance means an unplanned exceptional event that becomes evident after the commencement of the FDP, such as unforecast weather, equipment malfunction, or air traffic delay.

Note Guidance on the application of ***unforeseen operational circumstances*** is contained in CAAP 48-01.

window of circadian low, or ***WOCL***, for an FCM, means:

(a) in Appendix 2:

(i) if the FCM is acclimatised — the period between the hours of 0200 and 0559 local time at the location where the FCM is acclimatised; or

(ii) if the FCM is in an unknown state of acclimatisation — the period between the hours of 0200 and 0559 local time at the location where the FCM was last acclimatised; and

(b) in an Appendix other than Appendix 2 — the period between the hours of 0200 and 0559 local time at the location where the FCM commences a duty period.

written application, for an approval, means the written application of the AOC holder who is seeking the approval.

6.2 In this CAO, if any duty is performed during all, or any part, of the period of the ***WOCL***, the WOCL is infringed.

6.3 For this CAO, ***positioning***, for a person who is employed as an FCM:

(a) means being transported, as a passenger, to a location, by any mode of transportation, as required by the AOC holder; and

(b) does not include being transported to or from suitable accommodation after or before an FDP; and

(c) if undertaken immediately before duty that includes the person flying an aircraft as an FCM (***flying duty***) — must be considered part of his or her FDP; and

(d) if undertaken immediately after the person's flying duty and no other flying duty is to be conducted in the duty period — is not part of his or her FDP or off-duty period; and

(e) is duty and part of the duty period.

Note The time spent positioning following an FDP, as described in subparagraph 6.3 (d), is not part of the FDP or off-duty period. However, it is added to the FDP for calculating off-duty period requirements. See, for example, clause 10 in Appendix 2.

6.4 The expression, ***the operations manual***, when used in a provision of this CAO, is taken to mean whichever of the following the Regulations require of the AOC holder to whom the provision applies:

(a) the operations manual of the AOC holder;

(b) the exposition of the AOC holder.

6.5 In this CAO, other than subsection 4:

(a) a reference to an AOC is taken to include a Part 138 certificate or a Part 141 certificate; and

(b) a reference to an AOC holder, or a holder, is taken to include a Part 138 operator or a Part 141 operator; and

(c) a reference to an FCM of an AOC holder (however described) is taken to include an FCM of a Part 138 operator or a Part 141 operator.

7 Determination of acclimatisation

7.1 At the commencement of an FDP or an off-duty period at a location, an FCM must be considered to be acclimatised to the location if:

(a) the location differs in local time by less than 2 hours from the location where the FCM was last acclimatised; and

(b) the FCM has remained in an acclimatised state since he or she was last acclimatised.

Note AOC holders and FCMs should be aware that a determination of acclimatisation under this definition may impact on an individual's body clock to a small degree. For guidance on acclimatisation, AOC holders and FCMs should refer to CAAP 48-01.

7.2 At the commencement of an FDP or an off-duty period (a ***period***) at a new location which differs in local time by 2 hours or more from the location where the FCM was last acclimatised (the ***original location***), the FCM is considered to remain acclimatised to the original location if the period at the new location commences less than 36 hours after the FCM commenced a duty period at the original location.

7.3 At the commencement of an FDP or an off-duty period (a ***period***) at a new location which differs in local time by 2 hours or more from the location where the FCM was last acclimatised (the ***original location***), the FCM is considered to be in an unknown state of acclimatisation if the period at the new location commences 36 hours or more after the FCM commenced a duty period at the original location.

7.4 An FCM is considered to remain in his or her state of acclimatisation (whether acclimatised to a particular location, or in an unknown state of acclimatisation) until he or she has had:

(a) an adaptation period in a location (the ***adaptation location***) in accordance with Table 7.1 in this subsection; or

(b) an adaptation period that is:

(i) in a location other than home base; and

(ii) in accordance with subparagraph (a); and

(iii) reduced by 12 hours for each previous off-duty period that:

(A) immediately preceded the adaptation period; and

(B) was taken at an off-duty location which differs in local time by less than 2 hours from the adaptation location; and

(C) included an off-duty location local night.

7.5 In applying Table 7.1 to arrive at an adaptation period for paragraph 7.4:

(a) determine the time zone displacement between:

(i) the location where the FCM was last acclimatised (the ***original location***); and

(ii) each location where an FDP or off-duty period was commenced since last acclimatised (***later locations***); and

(b) then choose the time zone displacement between the original location and whichever of the later locations gives the greatest time zone displacement; and

(c) then choose the time zone change in the Table that corresponds to the greatest time zone displacement; and

(d) then choose the direction (west or east) in which the FCM travelled and in which, therefore, the greatest time zone displacement occurred under subparagraph (b); and

(e) then choose the number of hours west or east (as the case requires) that corresponds to the time zone change chosen under subparagraph (c).

Table 7.1 Adaptation period to become acclimatised

Time zone change (measured in time zones)	**Adaptation period to become acclimatised to new location (hours)**	
Note See definition of ***time zone***	***West***	***East***
2	24	30
3	36	45
4	48	60
5	48	60
6	48	60
7	72	90
8	72	90
9	72	90
10 or more	96	120

Note 1 ***Adaptation period*** means a continuous off-duty period for an FCM to become acclimatised to a particular location.

Note 2 An adaptation period under paragraph 7.4 may commence before the time when an FCM comes to be in an unknown state of acclimatisation.

Note 3 For guidance in determining acclimatisation, including examples of how an FCM becomes reacclimatised in accordance with paragraph 7.4, AOC holders and FCMs should refer to CAAP 48-01.

PART 2 CONDITIONS

8 General condition on Air Operators' Certificates

Each AOC is subject to the condition that the AOC holder must:

(a) comply with each requirement for the AOC holder as set out in this CAO; and

(b) comply with the limits and requirements for an FCM as provided for by each Appendix of this CAO which the AOC holder applies to the FCM; and

(c) ensure that each of the AOC holder's FCMs, when acting as such, complies with each requirement imposed by this CAO on flight crew licences.

9 General conditions on flight crew licences

9.1 The flight crew licence of an AOC holder's FCM is subject to the condition that the FCM must comply with each limit and requirement imposed on the FCM by this CAO.

9.2 The flight crew licence of an FCM in a private operation is subject to the condition that the FCM must comply with the requirement imposed on the FCM by paragraph 16.1 of this CAO.

Note Under regulation 11.077 of CASR, breach of a flight crew licence condition is a strict liability offence.

PART 3 LIMITS AND REQUIREMENTS

10 Limits and requirements for operations

10.1 Subject to subsections 11, 12 and 13, for an aircraft operation mentioned in column 1 of Table 10.1, an AOC holder must:

(a) choose at least 1 of the Appendices in column 2 of the Table that corresponds to the operation; and

(b) comply with the limits and requirements for FCMs mentioned in whichever 1 or more of the Appendices in column 2 of the Table the holder chooses that corresponds to the operation; and

(c) for each kind of operation conducted by the holder — specify in the operations manual the Appendix or Appendices with which the holder has chosen to comply.

Note 1 In this subsection, and generally throughout the CAO, a reference to an AOC holder is taken to include a reference to a Part 138 operator and a Part 141 operator: see paragraph 6.4, but also paragraph 4.2.

Note 2 This CAO, including the limits and requirements under subsection 10, does not apply to flight training in a flight simulation training device. However, if an AOC holder requires an FCM to carry out flight training in a flight simulation training device (***FSTD***) as well as flight duties, the training in the FSTD must be counted as duty by virtue of the definition of ***duty*** in subsection 6.

Table 10.1 Limits and requirements for operations

Column 1 — Operation	Column 2 — Appendix
Any operation.	Appendix 1
Any multi-pilot operation, except flight training.	Appendix 2
Any multi-pilot operation, except: (a) a complex operation; and (b) flight training.	Appendix 3
Any operation.	Appendix 4
Any balloon operation.	Appendix 4A
Any of the following: (a) a medical transport operation; (b) an emergency service operation; (c) flight training for an operation mentioned in paragraphs (a) and (b); (d) an operator proficiency check for an operation mentioned in paragraph (a) or (b); (e) a flight review for an operation mentioned in paragraph (a) or (b).	Appendix 4B
Any of the following: (a) an aerial work operation; (b) flight training associated with aerial work; (c) an operator proficiency check for an operation mentioned in paragraph (a); (d) a flight review for an operation mentioned in	Appendix 5

Column 1 — Operation	Column 2 — Appendix
paragraph (a).	
Any of the following: (a) an aerial work operation, conducted during daylight hours only; (b) flight training associated with aerial work conducted during daylight hours only; (c) an operator proficiency check for an operation mentioned in paragraph (a); (d) a flight review for an operation mentioned in paragraph (a).	Appendix 5A
Any of the following: (a) flight training; (b) a proficiency check; (c) a flight review.	Appendix 6
Any operation.	Appendix 7 *Note* Use of Appendix 7 requires CASA approval.

10.2 Subject to subsections 11 and 13, each FCM of an AOC holder must comply with the limits and requirements mentioned in the Appendix or Appendices which the AOC holder has chosen to comply with under paragraph 10.1.

11 Part 137 operations

11.1 Despite any other provision of this Order, this subsection takes effect on 2 September 2019.

11.2 In this subsection:

relevant operation means an aerial application operation in an aeroplane under Part 137 of CASR.

Note Subsection 11 has no application to aerial application operations in a helicopter.

11.3 Except for this subsection, paragraph 16.1 and any relevant definitions in subsection 5, this CAO does not apply to:

(a) an AOC holder engaged in a relevant operation;

(b) an FCM employed by, and undertaking duties for, the AOC holder mentioned in subparagraph (a).

11.4 It is a condition on the AOC of an AOC holder mentioned in subparagraph 11.3 (a) that the holder must comply with Subpart 137.Q of CASR.

Note Such AOC holders are bound by Subpart 137.Q of CASR and there are penalties under Subpart 137.Q for failure to comply.

11.5 It is a condition on the flight crew licence of an FCM mentioned in subparagraph 11.3 (b) that the FCM must comply with Subpart 137.Q of CASR.

Note Such FCMs are bound by Subpart 137.Q of CASR and there are penalties under Subpart 137.Q for failure to comply.

11.6 Subject to paragraph 11.7, before an FCM conducts a relevant operation for an AOC holder, the holder must be satisfied that the FCM has received awareness material, or training, in managing the fatigue-related risks relevant to his or her duties as an FCM.

11.7 Paragraph 11.6 does not apply until 1 July 2020 to an AOC holder for a relevant operation if the holder held an AOC for the relevant operation immediately before 30 April 2013.

12 Private operations

12.1 Subject to paragraph 12.3, this CAO does not apply to an AOC holder when conducting private operations.

12.2 Subject to the condition mentioned in paragraph 16.1, and paragraph 12.3, this CAO does not apply to an FCM when conducting private operations.

Note The condition under paragraph 16.1 applies to FCMs whether or not they are employed by an AOC holder. Paragraph 16.1, therefore, applies to FCMs engaged in private operations as well as FCMs engaged in operations under an AOC. Guidance on the assessment of individual cognitive and physical fitness is contained in CAAP 48-01. CASA recommends that FCMs engaged in private operations consider this guidance in determining self-prescribed limits.

12.3 Despite paragraphs 12.1 and 12.2, if an FCM performs duty by conducting a private operation (a ***private flight***) during an FDP that involves a flight that is not a private operation (a ***non-private flight***), the rules in paragraph 12.4 apply in relation to the FCM.

12.4 For paragraph 12.3:

(a) if the private flight is conducted *before* any non-private flight is conducted — the private flight time must be taken to be part of the FCM's FDP and must not be taken to be part of the FCM's off-duty period; and

(b) if the private flight is conducted *between* non-private flights — the private flight time must be taken to be part of the FCM's FDP and must not be taken to be part of the FCM's off-duty period; and

(c) if:

(i) only 1 non-private flight is conducted during the FDP; and

(ii) the private flight is conducted *after* the non-private flight;

the private flight time must be taken to be part of the FCM's duty period and must not be taken to be part of the FCM's off-duty period; and

(d) if:

(i) more than 1 non-private flight is conducted during the FDP; and

(ii) the private flight is conducted *after* the last non-private flight;

the private flight time must be taken to be part of the FCM's duty period and must not be taken to be part of the FCM's off-duty period.

Note CAAP 48-01 provides examples of how to consider private flights within an FDP.

13 Operations under multiple Appendices

13.1 If, under paragraph 10.1, 2 or more Appendices apply to a single FDP of an FCM, the following rules apply for an operation undertaken at any particular time in the FDP:

(a) the maximum FDP that an AOC holder and an FCM must comply with is the FDP limit contained in the Appendix under which the operation is being conducted at that particular time;

(b) the maximum flight time that an AOC holder and an FCM must comply with is the flight time limit contained in the Appendix under which the operation is being conducted at that particular time.

13.2 In determining the maximum FDP and flight time under paragraph 13.1, the limit determined from each Appendix must be based on the time of commencement of the FDP, and not on the time of commencement of operations under each Appendix.

13.3 At any particular time in an FDP, the AOC holder and FCM must each ensure that the FCM remains within the cumulative duty and cumulative flight time limits for the Appendix under which the operation is being conducted at that particular time.

13.4 Where operations under 2 or more Appendices are undertaken in a single FDP, the minimum off-duty period that the AOC holder and FCM must comply with following the FDP is that contained in the Appendix with the highest off-duty period as if the entire FDP was performed under that Appendix.

13.5 Subject to paragraph 13A.2, an AOC holder and an FCM must comply with the off-duty period requirements of the Appendix determined under paragraph 13.4 before the FCM commences another FDP.

13A Transitioning from Appendix 4B, 5 or 5A, or Subpart 137.Q of CASR

13A.1 Subject to paragraph 13A.2, an FCM, transitioning from the application of Appendix 4B, 5 or 5A, or Subpart 137.Q of CASR to his or her last FDP or standby, to the application of another Appendix of this CAO (other than Appendix 4B, 5 or 5A) (the ***other Appendix***) to his or her next FDP or standby, must before commencing the next FDP or standby under the other Appendix, have had at least 6 days off-duty in the previous 28 consecutive days.

13A.2 Subject to paragraph 13A.3, if, despite paragraph 13A.1, an FCM has not had the minimum number of days off-duty that are specified under the subsection for the transition to the other Appendix, the FCM may commence a first FDP or standby under the other Appendix provided that:

(a) the off-duty period immediately before the first FDP or standby under the other Appendix is at least 12 hours; and

(b) the report time for the FCM for the first FDP is not earlier than 0700 hours local time; and

(c) the FCM's previous FDP was less than 8 hours; and

(d) the first FDP is less than 8 hours in duration; and

(e) after the first FDP, there is only 1 subsequent FDP, also of less than 8 hours, before the requirements of paragraph 13A.1 must be complied with.

13A.3 Paragraph 13A.2 does not apply to a transition to Appendix 1.

14 AOC holder obligations

Fitness for duty

14.1 An AOC holder must not assign a duty on a flight to an FCM if the AOC holder reasonably believes that the FCM is unfit to perform the duty because of fatigue.

Limits

14.2 The limits and requirements that are to apply to an FCM must be determined in accordance with the Appendix chosen under this CAO to apply to the FCM.

Note The word "limit" in a provision refers expressly or impliedly to a quantity of time and, *depending on the context and other language of the provision*, is used to denote a maximum quantity of time that is not to be exceeded except in accordance with this CAO, or a minimum quantity of time that is not to be reduced except in accordance with this CAO.

Operations manual

14.3 The AOC holder must include in the operations manual:

(a) the limits arising from compliance with each applicable Appendix of this CAO that the holder has chosen to apply to an FCM, showing:

(i) each maximum limit under the Appendix which must not be exceeded; and

(ii) each minimum limit under the Appendix which must not be reduced; and

Note 1 For example, taking into account the provisions of an applicable Appendix, an FDP *limit* must not be exceeded, and an *off-duty period* must not be reduced.

Note 2 An AOC holder with an FRMS implementation approval must include relevant limits in the operations manual (see subclauses 2.5 and 3.2 in Appendix 7).

(b) for FCMs conducting a particular operation — each limit mentioned in subparagraph (a) as modified by the AOC holder for the FCMs and the operation, but not so as to exceed a maximum limit, or reduce a minimum limit, set out in the applicable Appendix; and

(c) where the need to take account of possible hazards arises under subsection 15 — for FCMs conducting a particular operation, each limit mentioned in subparagraph (b) as modified by taking the possible hazard into account.

Employee responsibilities

14.4 An AOC holder must set out in the operations manual its employees' responsibilities for operational fatigue management, and fatigue risk management.

Meals

14.5 Except for operations under Appendix 7 — Fatigue Risk Management System (FRMS), where an FCM's FDP is to exceed 5 hours, the AOC holder must provide the opportunity for the FCM to have access to adequate sustenance (a ***meal***) during the first 5 hours and periodically after that meal, so that not more than 5 hours elapse between each meal.

Note For operations under Appendix 7, it is expected that the FRMS would provide the opportunity for FCMs to have access to adequate sustenance at appropriate intervals.

Records and reports

14.6 An AOC holder must maintain records (including relevant reports and documents) of the following:

(a) FCM rosters;

(b) actual duty periods;

(c) actual flight times of each FCM when acting in the capacity of a crew member;

Note Thus, the flight time record does not include time spent positioning.

(d) actual split-duty rest periods, standby periods and off-duty periods;

(e) any FDP that was extended under the relevant provision (if any) of the Appendix or FRMS which the AOC holder has chosen to comply with, including information about the extensions in such detail as enables the holder to comply with subparagraph 14.8 (a).

Note A record under subparagraph 14.6 (e) is not required where an FDP is reassigned under the relevant provision of the Appendix, unless the reassignment results in an FDP that exceeds the relevant limit set out in the AOC holder's operations manual.

14.7 Each record mentioned in paragraph 14.6, including copies of reports and documents, must be securely retained for at least 5 years from the date the record and copy were made.

14.8 Each record concerning an extension of an FDP or a flight time limit mentioned in subparagraph 14.6 (e) must be:

(a) studied and used by the AOC holder to provide for continuous improvement of the holder's fatigue management, and fatigue risk management policies; and

(b) promptly given to CASA, if so requested in writing.

Home base

14.9 Subject to paragraph 14.10, an AOC holder must:

(a) determine the home base for each FCM (a ***home base determination***); and

(b) inform each FCM of his or her home base determination; and

(c) set out in its operations manual procedures for making a home base determination which ensure that each determination, and any changes to it, do not adversely affect aviation safety.

Note A determination of home base should be assigned with a degree of permanence.

14.10 Paragraph 14.9 does not apply for an AOC holder in relation to an FCM who only conducts operations for which the limitations and requirements are those set out in Appendix 5 or Appendix 5A.

Rosters

14.11 An AOC holder must publish each roster so far in advance of the FDPs and standby periods listed in it as to provide the FCM to whom it applies with a reasonable opportunity to plan adequate rest before his or her duty.

Note Guidance for AOC holders with regards to their obligations is contained in CAAP 48-01.

15 Enhanced fatigue management obligations

15.1 This subsection applies to an AOC holder to whom 1 or more of Appendices 2, 3, 4, 4A, 4B, 5, 5A and 6 of this CAO applies in accordance with subsection 10.

Operations manual procedures for hazards, multiple Appendices etc.

15.2 The AOC holder must set out the following in the operations manual:

(a) procedures for identifying any reasonably foreseeable hazard that may compromise an FCM's alertness during an FDP;

(b) procedures for determining the limits and requirements mentioned in subparagraph 14.3 (c) which take into account the identified hazards;

(c) procedures for the continuous monitoring and evaluation of the AOC holder's policies, limits, practices and relevant organisational experiences, taking into account the hazards identified by the procedures mentioned in subparagraph (a), with a view to continuous improvement of fatigue management, and fatigue risk management;

(d) where the AOC holder undertakes operations under multiple Appendices — procedures to ensure that transitions between the different limits of the Appendices:

(i) are undertaken in accordance with subsections 13 and 13A; and

(ii) do not adversely affect aviation safety;

(e) details of the training and assessment required by paragraph 15.3.

Note The procedures mentioned in this paragraph may be met, at least in part, by existing procedures such as those for an SMS.

Training

15.3 Subject to subsection 15A, the AOC holder must, as a minimum:

(a) make available, and require each FCM to undertake, initial and recurrent fatigue-related risk training relevant to the FCM's duties in operations under the AOC; and

(b) at the end of the initial training, and at the end of each occasion of recurrent training — assess the FCM's knowledge and learning from the training.

Note The training required by this paragraph may be incorporated into existing training programs such as an AOC holder's human factors and non-technical skills training program.

15.4 Initial training under paragraph 15.3:

(a) for an FCM who becomes an AOC holder's employee after this CAO takes effect for the holder — must occur within 6 months of the person commencing the employment; and

(b) for an FCM who was the AOC holder's employee on the date this CAO takes effect for the holder — must occur within 6 months of the CAO taking effect.

15.5 Initial training under paragraph 15.3 must:

(a) be in accordance with a syllabus; and

(b) deliver a thorough knowledge and understanding of the following:

(i) fatigue causes;

(ii) fatigue-related impairment;

(iii) the management of risks associated with fatigue;

(iv) the AOC holder's fatigue risk management obligations and procedures under the operations manual and this CAO; and

(c) equip each FCM with the ability to comply with his or her obligations under this CAO in operations for the AOC holder.

15.6 Recurrent training must occur at appropriate intervals and:

(a) be in accordance with a syllabus; and

(b) revise the knowledge and understanding acquired under paragraph 15.5; and

(c) deliver a thorough knowledge and understanding of any changes in the AOC holder's operating practices, or fatigue risk management obligations and procedures, that have occurred since initial training or the preceding recurrent training (as the case may be).

15.7 Subject to subsection 15A, an FCM must:

(a) attend the initial and each recurrent training mentioned in paragraph 15.3; and

(b) at the end of each training, successfully complete an assessment of learning from the training; and

(c) satisfy the AOC holder that he or she has sufficient knowledge of, and competence in managing, the fatigue-related risks relevant to his or her duties as an FCM.

15.8 The AOC holder must maintain for each FCM records of training and assessment completed under this subsection.

15.9 Each record mentioned in paragraph 15.8 must be securely retained from the date the record was made until at least 12 months after the FCM ceases to be employed by the AOC holder.

Note Guidance for AOC holders on these additional obligations is contained in CAAP 48-01.

15A Recognition of prior initial training

15A.1 In this subsection:

agent means an organisation contracted by an AOC holder to provide initial training to its FCMs.

currency time means the period of time that is the appropriate interval at which an AOC holder requires recurrent training to occur under paragraph 15.6.

Note For example, the interval may be every 18 months, or every 24 months. Further guidance is provided in CAAP 48-01.

initial training means fatigue-related risk training relevant to a person's duties as an FCM.

registered training organisation has the same meaning as in the Dictionary in CASR.

Note ***Registered training organisation*** means a training organisation listed on the National Register as a registered training organisation.

15A.2 This subsection applies to an AOC holder (the ***current AOC holder***) for an FCM (a ***new FCM***) who becomes a new employee of the current AOC holder.

15A.3 Subject to paragraph 15A.4, the references to initial training in paragraphs 15.3 and 15.7 do not apply to the current AOC holder for a new FCM who has successfully completed initial training (the ***prior initial training***) with:

(a) a different AOC holder or its agent; or

(b) the current AOC holder or its agent when previously employed by the current AOC holder; or

(c) a registered training organisation capable of delivering initial training.

15A.4 Paragraph 15A.3 does not apply unless:

(a) the prior initial training was completed within the currency time immediately before the new FCM becomes employed by the current AOC holder; and

(b) the current AOC holder is satisfied that:

(i) the prior initial training complied with the requirements of subparagraph 15.5 (a) and sub-subparagraphs 15.5 (b) (i) to (iii); and

(ii) the new FCM complied with the requirements of paragraph 15.7 for the prior initial training; and

(c) the satisfaction mentioned in subparagraph (b) is based on authentic records proving the matters mentioned in sub-subparagraphs (b) (i) and (ii); and

(d) within 4 weeks of the new FCM being employed by the current AOC holder — the new FCM has successfully completed an induction course to inform him or her of any fatigue-related risks and information specific to the current AOC holder; and

(e) the records mentioned in subparagraph (c), and details of the induction course mentioned in subparagraph (d), are:

(i) included with the new FCM records mentioned in paragraph 15.8; and

(ii) retained for at least the period mentioned in paragraph 15.9.

16 Flight crew member obligations

16.1 For subregulation 11.068 (1) of CASR, it is a condition on each flight crew licence that the licence holder must not begin to carry out any task for a flight if, due to fatigue, the FCM is, or is likely to be, unfit to perform a task that the FCM must perform during the flight.

Note Guidance for FCMs on this obligation is contained in CAAP 48-01.

16.2 The condition in paragraph 16.1 applies to an FCM regardless of whether the flight is conducted on behalf of an AOC holder, or a Part 138 operator, or a Part 141 operator, or as a private operation.

Note An FCM employed by an AOC holder must not exceed any limit specified for the FCM in the AOC holder's operations manual, except where an extension is permitted.

APPENDIX 1 BASIC LIMITS

1 Sleep opportunity before an FDP

1.1 An FCM must not be assigned or commence an FDP commencing away from home base unless, within the 10 hours immediately before commencing the FDP, he or she has at least 8 consecutive hours' sleep opportunity.

1.2 An FCM must not be assigned or commence an FDP commencing at home base unless, within the 12 hours immediately before commencing the FDP, he or she has at least 8 consecutive hours' sleep opportunity.

Note See subsection 6 of this CAO for the definition of ***sleep opportunity*** where it is defined as occurring during an off-duty period.

2 FDP and flight time limits

2.1 An FCM may only be assigned an FDP that is between the following times:

(a) the earlier of the following:

(i) the beginning of morning civil twilight on a day;

(ii) 0700 hours local time on the day;

(b) 0100 hours (local time at the location where the FDP commenced) on the following day.

2.2 Subject to subclauses 2.1, 2.3 and 2.4, an FCM may be assigned an FDP that is not longer than 9 hours.

2.3 If an FCM is assigned an FDP that is to commence before 0600 hours local time, being after the beginning of morning civil twilight — the assigned FDP must not be longer than 8 hours.

2.4 If an FCM is assigned an FDP that is to commence at or after 1400 hours local time — the assigned FDP must not be longer than 8 hours.

Note If an FDP commences *after* 1700 hours on a day, the FDP must be *less* than 8 hours because, under paragraph 2.1 (b), an FDP must not end later than 0100 hours on the following day (all times being local time at the commencing location).

2.5 An FCM may be assigned an FDP that finishes after 2200 hours local time (a ***late FDP***) only if not more than 3 late FDPs are assigned to the FCM in any 168 consecutive hours.

2.6 An FCM must not be assigned or commence flight time for flight training during an FDP unless the flight training is conducted during the first 7 hours of the FDP's flight time.

2.7 An FCM must not exceed the flight time limit, or an FDP limit mentioned in subclause 2.2, 2.3 or 2.4, except in accordance with clause 3.

3 Extensions

3.1 An FDP limit mentioned in clause 2 may be extended by up to 1 hour if:

(a) the FDP has commenced; and

(b) unforeseen operational circumstances arise; and

(c) an extension of the FDP is operationally necessary to complete the duty; and

(d) the FCM considers himself or herself fit for the extension.

Note 1 Under regulation 91.215 of CASR, the pilot in command of an aircraft is responsible for the conduct and safety of members of the crew on the aircraft and, therefore, has discretion not to permit an extension.

Note 2 Guidance on the assessment of individual cognitive and physical fitness is contained in CAAP 48-01.

3.2 Flight training for up to 30 minutes may be conducted after the first 7 hours of the FDP's flight time if:

(a) unforeseen operational circumstances arise after the commencement of the FDP; and

(b) it is operationally necessary in order to complete the duty; and

(c) the FCM considers himself or herself fit for the extension.

3.3 An FDP limit must not be extended under this clause if it would cause an FCM to exceed the cumulative flight time limits in clause 5.

3.4 Despite any limit or number under this Appendix, if:

(a) unforeseen operational circumstances arise after take-off on the final sector of an FDP; and

(b) the unforeseen operational circumstances would cause an FCM to exceed any limit or number permitted under this Appendix;

then, the flight may continue to the planned destination at the discretion of the pilot in command.

4 Off-duty period limits

4.1 An FCM must have a minimum off-duty period of at least 12 consecutive hours during any consecutive 24-hour period.

4.2 Before beginning an FDP, an FCM must have had:

(a) at least 36 consecutive hours off-duty, including 2 local nights, in the 168 hours before the projected end time of the assigned FDP; and

(b) at least 6 days off-duty in the 28 consecutive days before the FDP commences.

4.3 If an FDP under this Appendix is followed by an FDP under another Appendix, then, despite anything in the other Appendix, the FCM must have a minimum off-duty period of at least 12 consecutive hours before commencing the FDP under the other Appendix.

5 Limit on cumulative flight time

5.1 The cumulative flight time accrued by an FCM during any consecutive 28-day period must not exceed 100 hours.

5.2 The cumulative flight time accrued by an FCM during any consecutive 365-day period must not exceed 1 000 hours.

APPENDIX 2 MULTI-PILOT OPERATIONS EXCEPT FLIGHT TRAINING

1 Sleep opportunity before an FDP or standby

1.1 An FCM must not be assigned or commence an FDP or standby commencing away from home base unless he or she has at least 8 consecutive hours' sleep opportunity within the 10 hours immediately before:

(a) if the commencement of the FDP has not been delayed — commencing the FDP; or

(b) subject to paragraph (c), if the commencement of the FDP has been delayed — the original reporting time for the FDP; or

(c) if the commencement of the FDP has been delayed by a single delay of 10 hours or more — commencing the FDP following the delay; or

(d) for a standby — commencing the standby.

1.2 An FCM must not be assigned or commence an FDP or standby commencing at home base unless he or she has at least 8 consecutive hours' sleep opportunity within the 12 hours immediately before:

(a) if the commencement of the FDP has not been delayed — commencing the FDP; or

(b) subject to paragraph (c), if the commencement of the FDP has been delayed — the original reporting time for the FDP; or

(c) if the commencement of the FDP has been delayed by a single delay of 10 hours or more — commencing the FDP following the delay; or

(d) for a standby — commencing the standby.

Note See subsection 6 of this CAO for the definition of ***sleep opportunity***, where it is defined as occurring during an off-duty period.

2 Limits for an acclimatised FCM

2.1 Subject to clause 5, an acclimatised FCM must not be assigned an FDP longer than the number of hours specified in Table 2.1 in this clause (the ***FDP limit***), as determined by the acclimatised time at the start of the FDP and the number of sectors to be flown.

2.2 An acclimatised FCM must not be assigned flight time longer than 10.5 hours except in an augmented crew operation.

Note There is no flight time limit for an augmented crew operation.

2.3 In applying Table 2.1, first, choose the appropriate acclimatised time at which the FDP for the FCM is to start, then choose the number of sectors which are to be flown. The maximum FDP for the acclimatised FCM is the number under the chosen number of sectors that corresponds to the chosen acclimatised time at which the FDP for the FCM is to start.

Table 2.1 Maximum FDP (in hours) for an acclimatised FCM according to number of sectors and acclimatised time at the start of the FDP

Acclimatised time at start of FDP	Maximum FDP hours according to sectors to be flown					
	1-3	4	5	6	7	8+
0000-0459	10	9.5	9	8.5	8	7.5
0500-0559	11	10.5	10	9.5	9	8.5
0600-0659	12	11.5	11	10.5	10	9.5
0700-1259	13	12.5	12	11.5	11	10.5
1300-1359	12	11.5	11	10.5	10	9.5
1400-1459	11	10.5	10	9.5	9	8.5
1500-2359	10	9.5	9	8.5	8	7.5

Note To determine an FCM's acclimatised time, refer to subsection 7 at the beginning of this CAO.

3 Limits for an FCM in an unknown state of acclimatisation

3.1 Subject to clause 5, an FCM in an unknown state of acclimatisation must not be assigned an FDP longer than the number of hours specified in Table 3.1 in this clause, as determined by duration of the off-duty period immediately before the FDP and the number of sectors to be flown.

3.2 An FCM in an unknown state of acclimatisation must not be assigned flight time longer than 10.5 hours except in an augmented crew operation.

Note There is no flight time limit for an augmented crew operation.

3.3 In applying Table 3.1, first, choose the appropriate duration of off-duty period before the FDP for the FCM, then choose the number of sectors which are to be flown. The maximum FDP for the appropriate off-duty period for the FCM is the number under the chosen number of sectors that corresponds to the chosen off-duty period.

Table 3.1 Maximum FDP for an FCM in an unknown state of acclimatisation according to number of sectors and duration of the off-duty period immediately before the FDP

Duration of off-duty period immediately before the FDP	Maximum FDP hours according to sectors to be flown					
	1-3	4	5	6	7	8+
Less than 30 hours	10	9.5	9	8.5	8	7.5
30 hours or more	12	11.5	11	10.5	10	9.5

3.4 An FCM may only be assigned 4 consecutive FDPs in an unknown state of acclimatisation after which the FCM must have an adaptation period sufficient to become reacclimatised in accordance with paragraph 7.4 at the beginning of this CAO.

4 Increase in FDP limits by split duty

4.1 Subject to subclause 4.4, where an FDP contains a split-duty rest period of at least 4 consecutive hours with access to suitable sleeping accommodation, the

maximum FDP worked out under clause 2 or 3 may be increased by up to 4 hours, provided the new maximum under clause 2 or 3 does not then exceed 16 hours.

4.2 After an FDP mentioned in subclause 4.1, the first 4 hours of the split-duty rest period may be reduced by 2 hours in determining the subsequent off-duty period or cumulative duty time under clause 10 or 12 of this Appendix.

4.3 Subject to subclause 4.4, where an FDP contains a split-duty rest period of at least 2 consecutive hours with access to suitable resting accommodation, the FDP limits under subclause 2.1 or 3.1 may be increased by half the duration of the split-duty rest period, provided the increase is not more than 2 hours.

4.4 If a split-duty rest period includes any period between the hours of 2300 to 0529:

(a) acclimatised time; or

(b) if the FCM is in an unknown state of acclimatisation — local time;

then:

(c) the split-duty rest period must be for a consecutive period of at least 7 hours with access to suitable sleeping accommodation; and

(d) the maximum FDP may be increased to 16 hours (if not already permitted); and

(e) the reduction in the subsequent off-duty period and cumulative duty time, provided for in subclause 4.2, does not apply.

4.5 Any remaining portion of an FDP following a split-duty rest period must be no longer than 6 hours.

5 Increase in FDP and flight time limits in an augmented crew operation

5.1 An acclimatised FCM in an augmented crew operation may be assigned an FDP that is no longer than the number of hours specified in Table 5.1 in this clause, as determined by the acclimatised time at the start of the FDP, the class of crew rest facility available, and the number of additional FCMs — but only if the conditions in subclause 5.3 are met.

5.2 An FCM in an unknown state of acclimatisation in an augmented crew operation may be assigned an FDP that is no longer than the number of hours specified in Table 5.2 in this clause, as determined by the duration of the off-duty period immediately before the FDP, the class of crew rest facility available, and the number of additional FCMs — but only if the conditions in subclause 5.3 are met.

5.3 For subclauses 5.1 and 5.2, the conditions are as follows:

(a) the AOC holder's operations manual must have procedures for augmented crew operations;

(b) the FCMs at the end of the FDP for the augmented crew operation must be the same as the FCMs who commenced the first sector of the FDP;

Note For safety reasons, this is a critical condition. If, for example, a medical emergency required the disembarkation of an FCM during the FDP, for the flight to continue all of the FCMs must be replaced with a new augmented crew commencing a new FDP.

(c) the FDP must be limited to not more than 3 sectors;

(d) the minimum in-flight rest during the FDP must be:

(i) for each FCM who will not be at the aircraft controls during the final landing — 1.5 consecutive hours; and

(ii) for each FCM who will be at the aircraft controls during the final landing — 2 consecutive hours;

(e) the in-flight rest must be planned for the cruise phase of the flight;

(f) if an assigned FDP is to exceed 14 hours, then:

(i) not more than 2 sectors may be assigned; and

(ii) where 2 sectors are assigned, either:

(A) each FCM who will be at the aircraft controls during the landing at the end of the second sector must have had an in-flight rest period of at least 2 consecutive hours within the 8-hour period that ends at the scheduled time of the landing; or

(B) the scheduled flight time of the second sector must be at least 9 hours;

(g) if an assigned FDP is to exceed 16 hours, then:

(i) only 1 sector may be assigned; and

(ii) the minimum in-flight rest during the FDP must be:

(A) for each FCM who will not be at the aircraft controls during the final landing — 2 consecutive hours; and

(B) for each FCM who will be at the aircraft controls during the final landing — 3 consecutive hours.

Note The minimum in-flight rest specified may not provide adequate rest to ensure alertness for the remainder of the FDP. Guidance on the use of in-flight rest is contained in CAAP 48-01.

5.4 To apply Table 5.1 for an FCM who is acclimatised, first, choose the appropriate acclimatised time at which his or her FDP is to start, then choose the class of crew rest facility available and within the class choose the number of additional FCMs. The maximum FDP for the acclimatised FCM is the number under the chosen number of additional FCMs under the chosen class that corresponds to the acclimatised time at which the FDP for the FCM is to start.

Table 5.1 Maximum FDP (in hours) for an acclimatised FCM in an augmented crew operation according to class of crew rest facility, number of additional FCMs and acclimatised time at the start of the FDP

Acclimatised time at start of FDP	**Maximum FDP according to class of crew rest facility and number of additional FCMs**					
	Class 1		**Class 2**		**Class 3**	
Additional FCMs	**1**	**2**	**1**	**2**	**1**	**2**
0700-1059	16	18	15	16.5	14	15
1100-1559	16	18	15	16.5	13	14
1600-0459	16	18	15	16.5	12	13
0500-0659	16	18	15	16.5	13	14

Note To determine an FCM's acclimatised time, refer to subsection 7 at the beginning of this CAO.

5.5 To apply Table 5.2 to an FCM who is in an unknown state of acclimatisation, first, choose the appropriate off-duty period that is immediately before his or her FDP, then choose the class of crew rest facility available and within the class choose the number of additional FCMs. The maximum FDP for the FCM is the number under the chosen number of additional FCMs under the chosen class that corresponds to the off-duty period.

Table 5.2 Maximum FDP (in hours) for an FCM in an unknown state of acclimatisation in an augmented operation according to class of crew rest facility, number of additional FCMs and duration of off-duty period immediately before the FDP

Duration of off-duty period immediately before the FDP	Maximum FDP according to class of crew rest facility and number of additional FCMs					
	Class 1		Class 2		Class 3	
Additional FCMs	**1**	**2**	**1**	**2**	**1**	**2**
Less than 30 hours	16	18	15	16.5	12	13
30 hours or more	16	18	15	16.5	14	15

Note These are the maximum FDP and flight time limits under this Appendix unless, for any particular FCM, other provisions have the effect of reducing these limits (for example, subsections 14 and 15 of this CAO).

6 Delayed reporting time

Delays without operations manual procedures

6.1 Subclauses 6.2 to 6.4 apply to an AOC holder if the operations manual does not have procedures for delays.

6.2 The AOC holder may:

(a) only delay an FCM's reporting time (the ***original reporting time***) if the FCM is first informed of the delay at least 10 hours before the reporting time; and

(b) if paragraph (a) applies — consider the period between the original reporting time and the new reporting time (the ***period of the delay***) to be an off-duty period; and

(c) if paragraph (b) applies — at the end of the off-duty period, assign an FDP to the FCM subject to the applicable limits set out in this Appendix or another Appendix of this CAO.

6.3 If the AOC holder:

(a) delays the FCM's original reporting time; and

(b) does not inform the FCM of the delay at least 10 hours before the original reporting time;

then the FCM's FDP is taken to commence at the original reporting time.

6.4 If subclause 6.3 applies, the off-duty period requirements of this Appendix apply to the FCM whether or not the flight occurs.

Delays under operations manual procedures

6.5 Subclauses 6.6 to 6.13 apply to an AOC holder if the operations manual has procedures for 1 or more delays.

6.6 If an AOC holder's operations manual has procedures for delays, the AOC holder may delay an FCM's original reporting time if the AOC holder informs the FCM of the new reporting time as follows:

(a) if the FCM is at home base:

(i) at least 2 hours before the original reporting time; and

(ii) at least 2 hours before each new reporting time; or

(b) if the FCM is not at home base:

(i) at least 1 hour before the time the FCM would normally have had to leave his or her accommodation in order to report in a timely way for duty at the original reporting time; and

(ii) at least 1 hour before each new time the FCM would normally have had to leave his or her accommodation in order to report in a timely way for duty at the reporting time.

6.7 If an FCM is informed of a delay in accordance with subclause 6.6, the period between the original reporting time and the final new reporting time is deemed to be standby.

Note The period mentioned in subclause 6.7 is deemed to be standby whether or not subparagraph (b) of the definition of ***standby*** is met.

6.8 If an FCM is not informed of a delay in accordance with subclause 6.6, the FCM's FDP is taken to commence at whichever of the following is the later:

(a) the original reporting time;

(b) the last new reporting time following a delay of which the FCM was informed in accordance with subclause 6.6.

6.9 If subclause 6.8 applies, the off-duty period requirements of this Appendix apply to the FCM whether or not the flight occurs.

A single delay of at least 10 hours under operations manual procedures

6.10 Despite subclause 6.7, if the period of any single delay to an FCM's FDP is at least 10 hours, the AOC holder may:

(a) consider the period of the delay to be an off-duty period; and

(b) at the end of the off-duty period, assign an FDP to the FCM subject to the applicable limits set out in this Appendix or another Appendix of this CAO.

Maximum FDP after delay under operations manual procedures

6.11 Subject to subclause 6.13, if:

(a) an FCM's FDP is delayed under subclause 6.6; and

(b) the FDP commences at a new reporting time that is within 4 hours of the original reporting time;

then the maximum FDP must be based on whichever of the following is the more limiting in calculating the FDP:

(c) the original reporting time;

(d) the new reporting time.

6.12 Subject to subclause 6.13, if:

(a) the FCM's FDP is delayed under subclause 6.6; and

(b) the FDP commences at a new reporting time that is at least 4 hours after the original reporting time;

then:

(c) the FDP is taken to have commenced 4 hours after the original reporting time; and

(d) the maximum FDP must be based on whichever of the following is the more limiting in calculating the FDP:

(i) the original reporting time;

(ii) the time at which the FDP is taken to have commenced in accordance with paragraph (c).

6.13 The combined duration of 1 or more delays and the immediately following FDP must not exceed 16 hours unless the FDP:

(a) is an augmented crew operation;

(b) contains a split-duty rest period.

Cancellations — with or without operations manual procedures for delays

6.14 If:

(a) an FCM's FDP is delayed under subclause 6.2 or 6.6; and

(b) the AOC holder informs the FCM that the flight will not occur (***cancellation***);

then, the FCM must have an off-duty period of at least 10 consecutive hours, commencing from the time he or she is informed of the cancellation, before again being assigned an FDP in accordance with this Appendix or another Appendix of this CAO.

Meaning of "informed"

6.15 In this clause:

informed means informed by the AOC holder in accordance with procedures in the holder's operations manual for communicating information between the holder and an FCM.

7 Reassignment and extension

7.1 After an FCM's assigned FDP commences, the AOC holder may reassign to the FCM a modified FDP and number of sectors to be flown (a ***reassignment***), provided that each of the following applies:

(a) subject to subclause 7.3 — the modified FDP and flight time does not exceed the limits in the holder's operations manual for the new number of sectors;

(b) the FCM has confirmed that he or she is fit for the reassignment.

Note Fitness in this context is based on the FCM's self-assessment. An FCM has an obligation under paragraph 16.1 of this CAO not to carry out any task for a flight if, due to fatigue, the FCM is, or is likely to become, unfit for the task. If such circumstances apply, the FCM must decline the reassignment.

7.2 If subclause 7.1 applies, the FCM may continue in the modified FDP in accordance with subclause 7.1.

7.3 Despite the FDP limits provided in the operations manual, in unforeseen operational circumstances at the discretion of the pilot in command:

(a) the FDP limits in the operations manual may be extended by up to:

(i) 1 hour; or

(ii) for an augmented crew operation under clause 5 — 2 hours; and

(b) the sectors for the FDP limits may be increased by 1 more than would otherwise be the case for the FDP.

7.4 Before exercising the discretion under subclause 7.3 to extend the FDP limit of an FCM, the pilot in command must:

(a) do the following:

(i) consult each FCM who is a crew member on the aircraft;

(ii) be satisfied that each FCM considers himself or herself fit for the extension; and

(b) if the FCM whose FDP would be extended is the pilot in command — do the following:

(i) consult each FCM who is a crew member on the aircraft;

(ii) be satisfied that, as pilot in command, he or she is fit for the extension.

7.5 Despite the limits provided in the operations manual, the flight time limit for an FDP may be extended by not more than 30 minutes if:

(a) it is operationally necessary in order to complete the duty;

(b) the FCM, or each FCM, considers himself or herself fit for the extension.

7.6 An FDP limit must not be reassigned or extended under this clause if it would cause an FCM to exceed the cumulative flight time limits in clause 11 or the cumulative duty time limits in clause 12.

7.7 Despite any limit or number under this Appendix, if:

(a) unforeseen operational circumstances arise after take-off on the final sector of an FDP; and

(b) the unforeseen operational circumstances would cause an FCM to exceed any limit or number permitted under this Appendix;

then the flight may continue to the planned destination or alternate at the discretion of the pilot in command.

Note 1 Under regulation 91.215 of CASR, the pilot in command of an aircraft is responsible for the conduct and safety of members of the crew on the aircraft and, therefore, has a discretion to not permit an extension to occur even if otherwise permissible under this clause.

Note 2 Guidance on the assessment of individual cognitive and physical fitness is contained in CAAP 48-01.

8 Standby limits and standby-like arrangements

8.1 An AOC holder must not require an FCM to be on continuous standby for a period longer than 14 hours.

8.2 The maximum allowable FDP after a call out from standby must be decreased by the number of hours by which the standby exceeds 4 hours.

8.3 If an FCM is called out, the maximum combined duration of standby and the subsequent FDP is 16 hours, except where the subsequent FDP:

(a) is an augmented crew operation; or

(b) includes a split-duty rest period, in suitable sleeping accommodation, of at least 4 consecutive hours.

8.4 A standby which is completed without a call out must be followed by an off-duty period of at least 10 consecutive hours.

8.5 To remove any doubt, the period of time in which an FCM is held in a standby-like arrangement must be treated as a duty period for the purposes of this CAO.

Note For example, the period spent in a standby-like arrangement must be included as part of a following FDP assigned to the FCM or added to the preceding FDP when determining minimum off-duty periods under clause 10.

9 Positioning

On completion of assigned flight duties in an FDP (the ***relevant FDP***), an FCM may position to a suitable location as required by the AOC holder.

Note As with any duty, the time spent in positioning after completion of the FDP must be added to the relevant FDP when determining minimum off-duty periods under clause 10.

10 Off-duty period limits

Off-duty period following an FDP

10.1 If the sum of an FCM's FDP, and his or her duty time (if any) after completion of the FDP but before commencement of the following off-duty period, does not exceed 12 hours, his or her following off-duty period must be at least as follows:

(a) if the FCM is acclimatised and undertaking the off-duty period away from home base — the sum of:

(i) 10 hours; and

(ii) the amount that the displacement time exceeds 3 hours if travelling west, or 2 hours if travelling east;

(b) if the FCM is acclimatised and undertaking the off-duty period at home base — the sum of:

(i) 12 hours; and

(ii) the amount that the displacement time exceeds 3 hours if travelling west, or 2 hours if travelling east;

(c) if the FCM is in an unknown state of acclimatisation — the sum of:

(i) 14 hours; and

(ii) the amount of the displacement time.

10.2 If the sum of an FCM's FDP, and his or her duty time (if any) after completion of the FDP but before commencement of the following off-duty period (***other duty time***), exceeds 12 hours, his or her following off-duty period must be at least as follows:

(a) if the FCM is acclimatised — 12 hours, plus the sum of:

(i) 1.5 times the time that the FDP and the other duty time exceeded 12 hours; and

(ii) the amount that the displacement time exceeds 3 hours if travelling west, or 2 hours if travelling east;

(b) if the FCM is in an unknown state of acclimatisation — 14 hours, plus the sum of:

(i) 1.5 times the time that the FDP and the other duty time exceeded 12 hours; and

(ii) the amount of the displacement time.

Reduction in off-duty period

10.3 Despite subclause 10.1, if the sum of an FCM's FDP (the ***last FDP***), and his or her duty time (if any) after completion of the FDP but before commencement of the following off-duty period, does not exceed 10 hours, his or her following off-duty period (***ODP 2***), may be reduced to not less than 9 hours provided that:

(a) the off-duty period undertaken immediately before the last FDP was at least 12 hours, including a local night; and

(b) the FCM is acclimatised at the commencement of the ODP 2; and

(c) the ODP 2 is undertaken over a local night; and

(d) the ODP 2 is not undertaken at home base; and

(e) the off-duty period following the FDP after ODP 2 is at least 12 hours, including a local night.

10.4 Despite subclauses 10.1 and 10.2, if, after an FDP (the ***first FDP***) but before the next FDP (the ***second FDP***), the off-duty period calculated under this clause is more than 14 hours, the off-duty period may be reduced to not less than 14 hours, provided that:

(a) the reduced off-duty period is undertaken away from home base; and

(b) the first FDP was not extended past the FDP limit as provided for under the AOC holder's operations manual; and

(c) the FCM commences the second FDP in an acclimatised state; and

(d) the off-duty period following the second FDP is of at least 36 consecutive hours and includes 2 local nights.

Off-duty periods for cumulative fatigue recovery

10.5 Before beginning an FDP or standby, an FCM must have had at least 36 consecutive hours off-duty, including 2 local nights, in the 168 hours before the projected end time of the assigned FDP or assigned standby.

10.6 Before beginning an FDP or standby, an FCM must have had at least 6 days off-duty in the 28 consecutive days before the standby or FDP commences.

11 Limit on cumulative flight time

11.1 The cumulative flight time accrued by an FCM during any consecutive 28-day period must not exceed 100 hours.

11.2 The cumulative flight time accrued by an FCM during any consecutive 365-day period must not exceed 1 000 hours.

12 Limit on cumulative duty time

12.1 The cumulative duty accrued by an FCM during any consecutive 168-hour period must not exceed 60 hours.

12.2 The cumulative duty accrued by an FCM during any consecutive 336-hour period must not exceed 100 hours.

Note 168 hours is the number of hours in a 7-day period, and 336 hours is the number of hours in a 14-day period.

13 Limits on infringing the WOCL and early starts

13.1 Subject to subclause 13.3, an FCM must not be assigned more than 3 consecutive early starts.

13.2 Subject to subclause 13.3, an FCM, whose duties have already infringed 3 consecutive WOCLs, must not be assigned an FDP that would again infringe the WOCL without at least an intervening off-duty period that includes a local night.

Note See paragraph 6.2 of this CAO for duties that infringe a WOCL.

13.3 Despite subclauses 13.1 and 13.2, the FCM may have a 4th, or a 4th and a 5th, consecutive early start (whether or not the start infringes the WOCL) if:

(a) the maximum FDP permissible on the day of the 4th early start is reduced by 2 hours; and

(b) the maximum FDP permissible on the day of the 5th early start is reduced by 4 hours.

14 Maximum durations must not be exceeded

Unless an extension is permitted under clause 7, in performing duty an FCM must not exceed the following:

(a) the maximum duration of the FDP specified for the FCM in the AOC holder's operations manual;

(b) the maximum flight time specified for the FCM in the AOC holder's operations manual.

APPENDIX 3 MULTI-PILOT OPERATIONS EXCEPT COMPLEX OPERATIONS AND FLIGHT TRAINING

Note Multi-pilot operations (other than flight training) that do not cross time zones, or involve augmented crew operations, may find Appendix 3 more suitable than Appendix 2 because it has the same limitations but is less complex.

1 Sleep opportunity before an FDP or standby

1.1 An FCM must not be assigned or commence an FDP or standby commencing away from home base unless he or she has at least 8 consecutive hours' sleep opportunity within the 10 hours immediately before:

(a) if the commencement of the FDP has not been delayed — commencing the FDP; or

(b) subject to paragraph (c), if the commencement of the FDP has been delayed — the original reporting time for the FDP; or

(c) if the commencement of the FDP has been delayed by a single delay of 10 hours or more — commencing the FDP following the delay; or

(d) for a standby — commencing the standby.

1.2 An FCM must not be assigned or commence an FDP or standby commencing at home base unless he or she has at least 8 consecutive hours' sleep opportunity within the 12 hours immediately before:

(a) if the commencement of the FDP has not been delayed — commencing the FDP; or

(b) subject to paragraph (c), if the commencement of the FDP has been delayed — the original reporting time for the FDP; or

(c) if the commencement of the FDP has been delayed by a single delay of 10 hours or more — commencing the FDP following the delay; or

(d) for a standby — commencing the standby.

Note See subsection 6 of this CAO for the definition of ***sleep opportunity***, where it is defined as occurring during an off-duty period.

2 FDP and flight time limits

2.1 An FCM must not be assigned an FDP longer than the number of hours specified in Table 2.1 in this clause (the ***FDP limit***), as determined by the local time at the start of the FDP and the number of sectors to be flown.

2.2 An FCM must not be assigned flight time longer than 10.5 hours.

2.3 In applying Table 2.1, first, choose the appropriate local time at which the FDP for the FCM is to start, then choose the number of sectors which are to be flown. The maximum FDP for the FCM is the number under the chosen number of sectors that corresponds to the chosen local time at which the FDP for the FCM is to start.

Table 2.1 Maximum FDP (in hours) for an FCM according to number of sectors and local time at the start of the FDP

Local time at start of FDP	Maximum FDP hours according to sectors to be flown					
	1-3	**4**	**5**	**6**	**7**	**8+**
0000-0459	10	9.5	9	8.5	8	7.5
0500-0559	11	10.5	10	9.5	9	8.5
0600-0659	12	11.5	11	10.5	10	9.5
0700-1259	13	12.5	12	11.5	11	10.5
1300-1359	12	11.5	11	10.5	10	9.5
1400-1459	11	10.5	10	9.5	9	8.5
1500-2359	10	9.5	9	8.5	8	7.5

3 Increase in FDP limits by split duty

3.1 Subject to subclause 3.4, where an FDP contains a split-duty rest period of at least 4 consecutive hours with access to suitable sleeping accommodation, the maximum FDP worked out under clause 2 may be increased by up to 4 hours, provided the new maximum under clause 2 does not then exceed 16 hours.

3.2 After an FDP mentioned in subclause 3.1, the first 4 hours of the split-duty rest period may be reduced by 2 hours in determining the subsequent off-duty period or cumulative duty time under clause 8 or 10 of this Appendix.

3.3 Subject to subclause 3.4, where an FDP contains a split-duty rest period of at least 2 consecutive hours with access to suitable resting accommodation, the FDP limits under subclause 2.1 may be increased by half the duration of the split-duty rest period, provided the increase is not more than 2 hours.

3.4 If a split-duty rest period includes any period between the hours of 2300 to 0529 local time, then:

(a) the split-duty rest period must be for a consecutive period of at least 7 hours with access to suitable sleeping accommodation; and

(b) the maximum FDP may be increased to 16 hours (if not already permitted); and

(c) the reduction in the subsequent off-duty period and cumulative duty time, provided for in subclause 3.2, does not apply.

3.5 Any remaining portion of an FDP following a split-duty rest period must be no longer than 6 hours.

4 Delayed reporting time

Delays without operations manual procedures

4.1 Subclauses 4.2 to 4.4 apply to an AOC holder if the operations manual does not have procedures for delays.

4.2 The AOC holder may:

(a) only delay an FCM's reporting time (the ***original reporting time***) if the FCM is first informed of the delay at least 10 hours before the reporting time; and

(b) if paragraph (a) applies — consider the period between the original reporting time and the new reporting time (the ***period of the delay***) to be an off-duty period; and

(c) if paragraph (b) applies — at the end of the off-duty period, assign an FDP to the FCM subject to the applicable limits set out in this Appendix or another Appendix of this CAO.

4.3 If the AOC holder:

(a) delays the FCM's original reporting time; and

(b) does not inform the FCM of the delay at least 10 hours before the original reporting time;

then, the FCM's FDP is taken to commence at the original reporting time.

4.4 If subclause 4.3 applies, the off-duty period requirements of this Appendix apply to the FCM whether or not the flight occurs.

Delays under operations manual procedures

4.5 Subclauses 4.6 to 4.13 apply to an AOC holder if the operations manual has procedures for 1 or more delays.

4.6 If an AOC holder's operations manual has procedures for delays, the AOC holder may delay an FCM's original reporting time if the AOC holder informs the FCM of the new reporting time as follows:

(a) if the FCM is at home base:

(i) at least 2 hours before the original reporting time; and

(ii) at least 2 hours before each new reporting time;

(b) if the FCM is not at home base:

(i) at least 1 hour before the time the FCM would normally have had to leave his or her accommodation in order to report in a timely way for duty at the original reporting time; and

(ii) at least 1 hour before each new time the FCM would normally have had to leave his or her accommodation in order to report in a timely way for duty at the reporting time.

4.7 If an FCM is informed of a delay in accordance with subclause 4.6, the period between the original reporting time and the final new reporting time is deemed to be standby.

Note The period mentioned in subclause 4.7 is deemed to be standby whether or not paragraph (b) of the definition of ***standby*** is met.

4.8 If an FCM is not informed of a delay in accordance with subclause 4.6, the FCM's FDP is taken to commence at whichever of the following is the later:

(a) the original reporting time;

(b) the last new reporting time following a delay of which the FCM was informed in accordance with subclause 4.6.

4.9 If subclause 4.8 applies, the off-duty period requirements of this Appendix apply to the FCM whether or not the flight occurs.

A single delay of at least 10 hours under operations manual procedures

4.10 Despite subclause 4.7, if the period of any single delay to an FCM's FDP is at least 10 hours, the AOC holder may:

(a) consider the period of the delay to be an off-duty period; and

(b) at the end of the off-duty period, assign an FDP to the FCM subject to the applicable limits set out in this Appendix or another Appendix of this CAO.

Maximum FDP after delay under operations manual procedures

4.11 Subject to subclause 4.13, if:

(a) an FCM's FDP is delayed under subclause 4.6; and

(b) the FDP commences at a new reporting time that is within 4 hours of the original reporting time;

then the maximum FDP must be based on whichever of the following is the more limiting in calculating the FDP:

(c) the original reporting time;

(d) the new reporting time.

4.12 Subject to subclause 4.13, if:

(a) the FCM's FDP is delayed under subclause 4.6; and

(b) the FDP commences at a new reporting time that is at least 4 hours after the original reporting time;

then:

(c) the FDP is taken to have commenced 4 hours after the original reporting time; and

(d) the maximum FDP must be based on whichever of the following is the more limiting in calculating the FDP:

(i) the original reporting time;

(ii) the time at which the FDP is taken to have commenced in accordance with paragraph (c).

4.13 The combined duration of 1 or more delays and the immediately following FDP must not exceed 16 hours unless the FDP contains a split-duty rest period.

Cancellations — with or without operations manual procedures for delays

4.14 If:

(a) an FCM's FDP is delayed under subclause 4.2 or 4.6; and

(b) the AOC holder informs the FCM that the flight will not occur (***cancellation***);

then the FCM must have an off-duty period of at least 10 consecutive hours, commencing from the time he or she is informed of the cancellation, before again being assigned an FDP in accordance with this Appendix or another Appendix of this CAO.

Meaning of "informed"

4.15 In this clause:

informed means informed by the AOC holder in accordance with procedures in the holder's operations manual for communicating information between the holder and an FCM.

5 Reassignment and extension

5.1 After an FCM's assigned FDP commences, the AOC holder may reassign to the FCM a modified FDP and number of sectors to be flown (a ***reassignment***), provided that each of the following applies:

(a) subject to subclause 5.3 — the modified FDP does not exceed the limits in the holder's operations manual for the new number of sectors;

(b) the FCM has confirmed that he or she is fit for the reassignment.

Note Fitness in this context is based on the FCM's self-assessment. An FCM has an obligation under paragraph 16.1 of this CAO not to carry out any task for a flight if, due to fatigue, the FCM is, or is likely to become, unfit for the task. If such circumstances apply, the FCM must decline the reassignment.

5.2 If subclause 5.1 applies, the FCM may continue in the modified FDP in accordance with subclause 5.1.

5.3 Despite the FDP limits provided in the operations manual, in unforeseen operational circumstances at the discretion of the pilot in command:

(a) the FDP limits in the operations manual may be extended by up to 1 hour; and

(b) the sectors for the FDP limits may be increased by 1 more than would otherwise be the case for the FDP.

5.4 Before exercising the discretion under subclause 5.3 to extend the FDP limit of an FCM, the pilot in command must:

(a) do the following:

(i) consult each FCM who is a crew member on the aircraft;

(ii) be satisfied that each FCM considers himself or herself fit for the extension; and

(b) if the FCM whose FDP would be extended is the pilot in command — do the following:

(i) consult each FCM who is a crew member on the aircraft;

(ii) be satisfied that, as pilot in command, he or she is fit for the extension.

5.5 Despite the limits provided in the operations manual, the flight time limit for an FDP may be extended by not more than 30 minutes if:

(a) it is operationally necessary in order to complete the duty; and

(b) the FCM, or each FCM, considers himself or herself fit for the extension.

5.6 An FDP limit must not be reassigned or extended under this clause if it would cause an FCM to exceed the cumulative flight time limits in clause 9 or the cumulative duty time limits in clause 10.

5.7 Despite any limit or number under this Appendix, if:

(a) unforeseen operational circumstances arise after take-off on the final sector of an FDP; and

(b) the unforeseen operational circumstances would cause an FCM to exceed any limit or number permitted under this Appendix;

then the flight may continue to the planned destination or alternate at the discretion of the pilot in command.

Note 1 Under regulation 91.215 of CASR, the pilot in command of an aircraft is responsible for the conduct and safety of members of the crew on the aircraft and, therefore, has a discretion to not permit an extension to occur even if otherwise permissible under this clause.

Note 2 Guidance on the assessment of individual cognitive and physical fitness is contained in CAAP 48-01.

6 Standby limits and standby-like arrangements

6.1 An AOC holder must not require an FCM to be on continuous standby for a period longer than 14 hours.

6.2 The maximum allowable FDP after a call out from standby must be decreased by the number of hours by which the standby exceeds 4 hours.

6.3 If an FCM is called out, the maximum combined duration of standby and the subsequent FDP is 16 hours except where the subsequent FDP includes a split-duty rest period, in suitable sleeping accommodation, of at least 4 consecutive hours.

6.4 A standby which is completed without a call out must be followed by an off-duty period of at least 10 consecutive hours.

6.5 To remove any doubt, the period of time in which an FCM is held in a standby-like arrangement must be treated as a duty period for the purposes of this CAO.

Note For example, the period spent in a standby-like arrangement must be included as part of a following FDP assigned to the FCM or added to the preceding FDP when determining minimum off-duty periods under clause 8.

7 Positioning

On completion of assigned flight duties in an FDP (the ***relevant FDP***), an FCM may position to a suitable location as required by the AOC holder.

Note As with any duty, the time spent in positioning after completion of the FDP must be added to the relevant FDP when determining minimum off-duty periods under clause 8.

8 Off-duty periods

Off-duty period following an FDP

8.1 If the sum of an FCM's FDP, and his or her duty time (if any) after completion of the FDP but before commencement of the following off-duty period, does not exceed 12 hours, his or her following off-duty period must be at least as follows:

(a) if the FCM is undertaking the off-duty period away from home base — 10 hours;

(b) if the FCM is undertaking the off-duty period at home base — 12 hours.

8.2 If the sum of an FCM's FDP, and his or her duty time (if any) after completion of the FDP but before commencement of the following off-duty period (***other duty time***), exceeds 12 hours, his or her following off-duty period must be at least the sum of:

(a) 12 hours; and

(b) 1.5 times the time that the FDP and the other duty time exceeded 12 hours.

Reduction in off-duty period

8.3 Despite subclause 8.1, if the sum of an FCM's FDP (the ***last FDP***), and his or her duty time (if any) after completion of the FDP but before commencement of the following off-duty period (***other duty time***), does not exceed 10 hours, his or her following off-duty period (***ODP 2***), may be reduced to not less than 9 hours provided that:

(a) the off-duty period undertaken immediately before the last FDP was at least 12 hours, including a local night; and

(b) the ODP 2 is undertaken over a local night; and

(c) the ODP 2 is not undertaken at home base; and

(d) the off-duty period following the FDP after ODP 2 is at least 12 hours, including a local night.

8.4 Despite subclause 8.2, if, after an FDP (the ***first FDP***) but before the next FDP (the ***second FDP***), the off-duty period calculated under this clause is more than 14 hours, the off-duty period may be reduced to not less than 14 hours, provided that:

(a) the reduced off-duty period is undertaken away from home base; and

(b) the first FDP was not extended past the FDP limit provided for under the AOC holder's operations manual; and

(c) the off-duty period following the second FDP is of at least 36 consecutive hours and includes 2 local nights.

Off-duty periods for cumulative fatigue recovery

8.5 Before beginning an FDP or standby, an FCM must have had at least 36 consecutive hours off-duty, including 2 local nights, in the 168 hours before the projected end time of the assigned FDP or assigned standby.

8.6 Before beginning an FDP or standby, an FCM must have had at least 6 days off-duty in the 28 consecutive days before the standby or FDP commences.

9 Limit on cumulative flight time

9.1 The cumulative flight time accrued by an FCM during any consecutive 28-day period must not exceed 100 hours.

9.2 The cumulative flight time accrued by an FCM during any consecutive 365-day period must not exceed 1 000 hours.

10 Limit on cumulative duty time

10.1 The cumulative duty accrued by an FCM during any consecutive 168-hour period must not exceed 60 hours.

10.2 The cumulative duty accrued by an FCM during any consecutive 336-hour period must not exceed 100 hours.

Note 168 hours is the number of hours in a 7-day period, and 336 hours is the number of hours in a 14-day period.

11 Limits on infringing the WOCL and early starts

11.1 Subject to subclause 11.3, an FCM must not be assigned more than 3 consecutive early starts.

11.2 Subject to subclause 11.3, an FCM, whose duties have already infringed 3 consecutive WOCLs, must not be assigned an FDP that would again infringe the WOCL without at least an intervening off-duty period that includes a local night.

Note See paragraph 6.2 of this CAO for duties that infringe a WOCL.

11.3 Despite subclauses 11.1 and 11.2, the FCM may have a 4th, or a 4th and a 5th, consecutive early start (whether or not the start infringes the WOCL) if:

(a) the maximum FDP permissible on the day of the 4th early start is reduced by 2 hours; and

(b) the maximum FDP permissible on the day of the 5th early start is reduced by 4 hours.

12 Maximum durations must not be exceeded

Unless an extension is permitted under clause 5, in performing duty an FCM must not exceed the following:

(a) the maximum duration of the FDP specified for the FCM in the AOC holder's operations manual;

(b) the maximum flight time specified for the FCM in the AOC holder's operations manual.

APPENDIX 4 ANY OPERATIONS

Note This Appendix would generally be used by an AOC holder conducting single-pilot air transport operations. However, it may also be used by an operator conducting multi-pilot operations, aerial work operations, flight training, or any combination of operations. The enhanced fatigue management obligations set out in subsection 15 of this CAO apply to an AOC holder operating under this Appendix.

1 Sleep opportunity before an FDP or standby

1.1 An FCM must not be assigned or commence an FDP or standby commencing away from home base unless he or she has at least 8 consecutive hours' sleep opportunity within the 10 hours immediately before:

(a) if the commencement of the FDP has not been delayed — commencing the FDP; or

(b) subject to paragraph (c), if the commencement of the FDP has been delayed — the original reporting time for the FDP; or

(c) if the commencement of the FDP has been delayed by a single delay of 10 hours or more — commencing the FDP following the delay; or

(d) for a standby — commencing the standby.

1.2 An FCM must not be assigned or commence an FDP or standby commencing at home base unless he or she has at least 8 consecutive hours' sleep opportunity within the 12 hours immediately before:

(a) if the commencement of the FDP has not been delayed — commencing the FDP; or

(b) subject to paragraph (c), if the commencement of the FDP has been delayed — the original reporting time for the FDP; or

(c) if the commencement of the FDP has been delayed by a single delay of 10 hours or more — commencing the FDP following the delay; or

(d) for a standby — commencing the standby.

Note See subsection 6 of this CAO for the definition of ***sleep opportunity***, where it is defined as occurring during an off-duty period.

2 FDP and flight time limits

2.1 An FCM must not be assigned an FDP longer than the number of hours specified in Table 2.1 in this clause (the ***FDP limit***), as determined by the local time at the start of the FDP.

2.2 An FCM must not be assigned or commence flight time for flight training during an FDP unless the flight training is conducted during the first 7 hours of the FDP's flight time.

2.3 In applying Table 2.1, first, choose the appropriate local time at which the FDP for the FCM is to start. The maximum FDP for the FCM is the number that corresponds to the chosen local time at which the FDP for the FCM is to start.

Table 2.1 Maximum FDP (in hours) according to local time at start of FDP

Local time at start of FDP	Maximum FDP
0500 – 0559	9
0600 – 0759	10
0800 – 1059	11
1100 – 1359	10
1400 – 2259	9
2300 – 0459	8

3 Increase in FDP limits by split duty

3.1 Subject to subclause 3.4, where an FDP contains a split-duty rest period of at least 4 consecutive hours with access to suitable sleeping accommodation, the maximum FDP worked out under clause 2 may be increased by up to 4 hours.

3.2 After an FDP mentioned in subclause 3.1, the first 4 hours of the split-duty rest period may be reduced by 2 hours for the purpose of determining the subsequent off-duty period or cumulative duty time under clause 8 or 10 of this Appendix.

3.3 Subject to subclause 3.4, where an FDP contains a split-duty rest period of at least 2 consecutive hours with access to suitable resting accommodation, the FDP limits under subclause 2.1 may be increased by half the duration of the split-duty rest period, provided the increase is not more than 2 hours.

3.4 If a split-duty rest period includes any period between the hours of 2300 to 0529 local time, then:

(a) the split-duty rest period must be for a consecutive period of at least 7 hours with access to suitable sleeping accommodation; and

(b) the maximum FDP may be increased to 15 hours (if not already permitted); and

(c) the reduction in the subsequent off-duty period and cumulative duty time, provided for in subclause 3.2, does not apply.

3.5 Any remaining portion of an FDP following a split-duty rest period must be no longer than 5 hours.

Note These are the maximum FDP and flight time limits under this Appendix unless, for any particular FCM, other provisions have the effect of reducing these limits (for example, subsections 14 and 15 of this CAO).

4 Delayed reporting time

Delays without operations manual procedures

4.1 Subclauses 4.2 to 4.4 apply to an AOC holder if the operations manual does not have procedures for delays.

4.2 The AOC holder may:

(a) only delay an FCM's reporting time (the ***original reporting time***) if the FCM is first informed of the delay at least 10 hours before the reporting time; and

(b) if paragraph (a) applies — consider the period between the original reporting time and the new reporting time (the ***period of the delay***) to be an off-duty period; and

(c) if paragraph (b) applies — at the end of the off-duty period, assign an FDP to the FCM subject to the applicable limits set out in this Appendix or another Appendix of this CAO.

4.3 If the AOC holder:

(a) delays the FCM's original reporting time; and

(b) does not inform the FCM of the delay at least 10 hours before the original reporting time;

then the FCM's FDP is taken to commence at the original reporting time.

4.4 If subclause 4.3 applies, the off-duty period requirements of this Appendix apply to the FCM whether or not the flight occurs.

Delays under operations manual procedures

4.5 Subclauses 4.6 to 4.13 apply to an AOC holder if the operations manual has procedures for 1 or more delays.

4.6 If an AOC holder's operations manual has procedures for delays, the AOC holder may delay an FCM's original reporting time if the AOC holder informs the FCM of the new reporting time as follows:

(a) if the FCM is at home base:

(i) at least 2 hours before the original reporting time; and

(ii) at least 2 hours before each new reporting time; or

(b) if the FCM is not at home base:

(i) at least 1 hour before the original reporting time; and

(ii) at least 1 hour before each new reporting time.

4.7 If an FCM is informed of a delay in accordance with subclause 4.6, the period between the original reporting time and the final new reporting time is deemed to be standby.

Note The period mentioned in subclause 4.7 is deemed to be standby whether or not subparagraph (b) of the definition of ***standby*** is met.

4.8 If an FCM is not informed of a delay in accordance with subclause 4.6, the FCM's FDP is taken to commence at whichever of the following is the later:

(a) the original reporting time; or

(b) the last new reporting time following a delay of which the FCM was informed in accordance with subclause 4.6.

4.9 If subclause 4.8 applies, the off-duty period requirements of this Appendix apply to the FCM whether or not the flight occurs.

A single delay of at least 10 hours under operations manual procedures

4.10 Despite subclause 4.7, if the period of any single delay to an FCM's FDP is at least 10 hours, the AOC holder may:

(a) consider the period of the delay to be an off-duty period; and

(b) at the end of the off-duty period, assign an FDP to the FCM subject to the applicable limits set out in this Appendix or another Appendix of this CAO.

Maximum FDP after delay under operations manual procedures

4.11 Subject to subclause 4.13, if:

(a) an FCM's FDP is delayed under subclause 4.6; and

(b) the FDP commences at a new reporting time that is within 4 hours of the original reporting time;

then the maximum FDP must be based on whichever of the following is the more limiting in calculating the FDP:

(c) the original reporting time;

(d) the new reporting time.

4.12 Subject to subclause 4.13, if:

(a) the FCM's FDP is delayed under subclause 4.6; and

(b) the FDP commences at a new reporting time that is at least 4 hours after the original reporting time;

then:

(c) the FDP is taken to have commenced 4 hours after the original reporting time; and

(d) the maximum FDP must be based on whichever of the following is the more limiting in calculating the FDP:

(i) the original reporting time;

(ii) the time at which the FDP is taken to have commenced in accordance with paragraph (c).

4.13 The combined duration of 1 or more delays and the immediately following FDP must not exceed 16 hours unless the FDP contains a split-duty rest period.

Cancellations — with or without operations manual procedures for delays

4.14 If:

(a) an FCM's FDP is delayed under subclause 4.2 or 4.6; and

(b) the AOC holder informs the FCM that the flight will not occur (***cancellation***);

then the FCM must have an off-duty period of at least 10 consecutive hours, commencing from the time he or she is informed of the cancellation, before again being assigned an FDP in accordance with this Appendix or another Appendix of this CAO.

Meaning of "informed"

4.15 In this clause:

informed means informed by the AOC holder in accordance with procedures in the holder's operations manual for communicating information between the holder and an FCM.

5 Reassignment and extension

5.1 After an FCM's assigned FDP commences, the AOC holder may reassign to the FCM a modified FDP (a ***reassignment***), provided that each of the following applies:

(a) subject to subclause 5.3 — the modified FDP does not exceed the applicable limits in the holder's operations manual;

(b) the FCM has confirmed that he or she is fit for the reassignment.

Note Fitness in this context is based on the FCM's self-assessment. An FCM has an obligation under paragraph 16.1 of this CAO not to carry out any task for a flight if, due to fatigue, the FCM is, or is likely to become, unfit for the task. If such circumstances apply, the FCM must decline the reassignment.

5.2 If subclause 5.1 applies, the FCM may continue in the modified FDP in accordance with subclause 5.1.

5.3 Despite the FDP limits provided in the operations manual, in unforeseen operational circumstances at the discretion of the pilot in command, the FDP limits in the operations manual may be extended by up to 1 hour.

5.4 Before exercising the discretion under subclause 5.3 to extend the FDP limit, the pilot in command must be satisfied that he or she is fit for the extension.

5.5 Flight training for up to 30 minutes may be conducted after the first 7 hours of the FDP's flight time if:

(a) unforeseen operational circumstances arise after the commencement of the FDP; and

(b) it is operationally necessary in order to complete the duty; and

(c) the FCM considers himself or herself fit for the extension.

5.6 An FDP limit must not be reassigned or extended under this clause if it would cause an FCM to exceed the cumulative flight time limits in clause 9 or the cumulative duty time limits in clause 10.

5.7 Despite any limit or number under this Appendix, if:

(a) unforeseen operational circumstances arise after take-off on the final sector of an FDP; and

(b) the unforeseen operational circumstances would cause an FCM to exceed any limit or number permitted under this Appendix;

then the flight may continue to the planned destination or alternate at the discretion of the pilot in command.

Note 1 Under regulation 91.215 of CASR, the pilot in command of an aircraft is responsible for the conduct and safety of members of the crew on the aircraft and, therefore, has a discretion to not permit an extension to occur even if otherwise permissible under this clause.

Note 2 Guidance on the assessment of individual cognitive and physical fitness is contained in CAAP 48-01.

6 Standby limits and standby-like arrangements

6.1 An AOC holder must not require an FCM to be on continuous standby for a period longer than 14 hours.

6.2 The maximum allowable FDP after a call out from standby must be decreased by the number of hours by which the standby exceeds 4 hours.

6.3 A standby which is completed without a call out must be followed by an off-duty period of at least 10 consecutive hours.

6.4 To remove any doubt, the period of time in which an FCM is held in a standby-like arrangement must be treated as a duty period for the purposes of this CAO.

Note For example, the period spent in a standby-like arrangement must be included as part of a following FDP assigned to the FCM or added to the preceding FDP when determining minimum off-duty periods under clause 8.

7 Positioning

On completion of assigned flight duties in an FDP (the ***relevant FDP***), an FCM may position to a suitable location as required by the AOC holder.

Note As with any duty, the time spent in positioning after completion of the FDP must be added to the relevant FDP when determining minimum off-duty periods under clause 8.

8 Off-duty periods

Off-duty period following an FDP

8.1 If the sum of an FCM's FDP, and his or her duty time (if any) after completion of the FDP but before commencement of the following off-duty period, does not exceed 12 hours, his or her following off-duty period must be at least as follows:

(a) if the FCM is undertaking the off-duty period away from home base — the sum of:

(i) 10 hours; and

(ii) the amount that the displacement time exceeds 3 hours if travelling west, or 2 hours if travelling east;

(b) if the FCM is undertaking the off-duty period at home base — the sum of:

(i) 12 hours; and

(ii) the amount that the displacement time exceeds 3 hours if travelling west, or 2 hours if travelling east.

8.2 If the sum of an FCM's FDP, and his or her duty time (if any) after completion of the FDP but before commencement of the following off-duty period (***other duty time***), exceeds 12 hours, his or her following off-duty period must be at least 12 hours, plus the sum of:

(a) 1.5 times the time that the FDP and the other duty time exceeded 12 hours; and

(b) the amount that the displacement time exceeds 3 hours if travelling west, or 2 hours if travelling east.

Reduction in off-duty period

8.3 Despite subclause 8.1, if the sum of an FCM's FDP (the ***last FDP***), and his or her duty time (if any) after completion of the FDP but before commencement of the following off-duty period, does not exceed 10 hours, his or her following off-duty period (***ODP 2***), may be reduced to not less than 9 hours provided that:

(a) the off-duty period undertaken immediately before the last FDP was at least 12 hours, including a local night; and

(b) the ODP 2 is undertaken over a local night; and

(c) the ODP 2 is not undertaken at home base; and

(d) the off-duty period following the FDP after ODP 2 is at least 12 hours, including a local night.

8.4 Despite subclause 8.2, if, after an FDP (the ***first FDP***), but before the next FDP (the ***second FDP***), the off-duty period calculated under this clause is more than 14 hours, the off-duty period may be reduced to not less than 14 hours, provided that:

(a) the reduced off-duty period is undertaken away from home base; and

(b) the first FDP was not extended past the FDP limit provided for under the AOC holder's operations manual; and

(c) the off-duty period following the second FDP is of at least 36 consecutive hours and includes 2 local nights.

Off-duty periods for cumulative fatigue recovery

8.5 Before beginning any standby time or FDP, an FCM must have had at least 36 consecutive hours off-duty, including 2 local nights, in the 168 hours before the projected end time of the assigned FDP or assigned standby.

8.6 Before beginning any standby time or FDP, an FCM must have had at least 6 days off-duty in the 28 consecutive days before the standby or FDP commences.

9 Limit on cumulative flight time

9.1 The cumulative flight time accrued by an FCM during any consecutive 28-day period must not exceed 100 hours.

9.2 The cumulative flight time accrued by an FCM during any consecutive 365-day period must not exceed 1 000 hours.

10 Limit on cumulative duty time

10.1 The cumulative duty accrued by an FCM during any consecutive 168-hour period must not exceed 60 hours.

10.2 The cumulative duty accrued by an FCM during any consecutive 336-hour period must not exceed 100 hours.

Note 168 hours is the number of hours in a 7-day period, and 336 hours is the number of hours in a 14-day period.

11 Limits on infringing the WOCL and early starts

11.1 Subject to subclause 11.3, an FCM must not be assigned more than 3 consecutive early starts.

11.2 Subject to subclause 11.3, an FCM, whose duties have already infringed 3 consecutive WOCLs, must not be assigned an FDP that would again infringe the WOCL without at least an intervening off-duty period that includes a local night.

Note See paragraph 6.2 of this CAO for duties that infringe a WOCL.

11.3 Despite subclauses 11.1 and 11.2, the FCM may have a 4^{th}, or a 4^{th} and a 5^{th}, consecutive early start (whether or not the start infringes the WOCL) if:

(a) the maximum FDP permissible on the day of the 4^{th} early start is reduced by 2 hours; and

(b) the maximum FDP permissible on the day of the 5^{th} early start is reduced by 4 hours.

12 Maximum durations must not be exceeded

Unless an extension is permitted under clause 5, in performing duty an FCM must not exceed the following:

(a) the maximum duration of the FDP specified for the FCM in the AOC holder's operations manual;

(b) the maximum flight time specified for the FCM in the AOC holder's operations manual.

APPENDIX 4A BALLOON OPERATIONS

1 Sleep opportunity before an FDP

An FCM must not be assigned or commence an FDP unless he or she has at least:

(a) 8 consecutive hours' sleep opportunity within the 10 hours immediately before commencing the FDP; or

(b) 10 hours' sleep opportunity, of which at least 6 must be consecutive, within the 24 hours immediately before commencing the FDP.

Note See subsection 6 of this CAO for the definition of ***sleep opportunity***, where it is defined as occurring during an off-duty period.

2 FDP limits

2.1 An FCM must not be assigned an FDP longer than the number of hours specified in Table 2.1 in this clause (the ***FDP limit***), as determined by whether or not the FDP contains a split-duty rest period.

Table 2.1Maximum FDP (in hours) for an FCM according to whether or not the FDP contains a split-duty rest period

Does the FDP contain a split-duty rest period?	Maximum FDP (hours)
No	6
Yes	10

2.2 An FCM cannot continue in an FDP for longer than 6 hours unless he or she has completed or commenced a split-duty rest period of at least 4 consecutive hours.

3 Increase in FDP limits by split duty

3.1 Subject to subclause 3.4, where an FDP contains a split-duty rest period of at least 4 consecutive hours with access to suitable sleeping accommodation (the ***split-duty rest period***), the maximum FDP may be increased by the duration of the split-duty rest period to a maximum of 15 hours.

3.2 After an FDP mentioned in subclause 3.1, the first 4 hours of the split-duty rest period may be reduced by 2 hours for the purpose of determining the subsequent off-duty period or cumulative duty time under clause 5 or 7 of this Appendix.

3.3 If a split-duty rest period includes any period between the hours of 2100 to 0329 local time, then:

(a) the split-duty rest period must be for a consecutive period of at least 7 hours with access to suitable sleeping accommodation; and

(b) subclause 3.2 does not apply.

3.4 Any remaining portion of an FDP following a split-duty rest period must be no longer than 5 hours.

Note These are the maximum FDP and flight time limits under this Appendix unless, for any particular FCM, other provisions have the effect of reducing these limits (for example, subsections 14 and 15 of this CAO).

4 Extensions

4.1 Despite the FDP limits provided in the operations manual, in unforeseen operational circumstances at the discretion of the pilot in command, the FDP limits in the operations manual may be extended up to a maximum of 1 hour if:

(a) the FDP has commenced; and

(b) the FCM considers himself or herself fit for the extension.

4.2 An FDP limit must not be extended under this clause if it would cause an FCM to exceed the cumulative flight time limits in clause 6 or the cumulative duty time limits in clause 7.

4.3 Despite any limit or number under this Appendix, if:

(a) unforeseen operational circumstances arise after take-off on the final sector of an FDP; and

(b) the unforeseen operational circumstances would cause an FCM to exceed any limit or number permitted under this Appendix;

then the flight may continue to the planned destination at the discretion of the pilot in command.

Note 1 Under regulation 91.215 of CASR, the pilot in command of an aircraft is responsible for the conduct and safety of members of the crew on the aircraft and, therefore, has a discretion to not permit an extension to occur even if otherwise permissible under this clause.

Note 2 Guidance on the assessment of individual cognitive and physical fitness is contained in CAAP 48-01.

5 Off-duty periods

5.1 Following an FDP, an FCM must have an off-duty period of at least 10 consecutive hours.

5.2 Despite subclause 5.1, an FCM may take 2 off-duty periods of not less than 4 consecutive hours each, with an intervening duty period of not more than 2 hours, provided the total duration of the 2 off-duty periods is not less than 13 hours.

Note The sleep opportunity requirements in clause 1 continue to apply. For example, if the use of 2 off-duty periods does not allow for a single period of 8 consecutive hours prior sleep opportunity, then paragraph 1.1 (b) of this Appendix provides for the option of using 2 or more periods to achieve a prior sleep opportunity of 10 hours, provided 1 of the periods is a minimum of 6 consecutive hours.

5.3 Before beginning any FDP, an FCM must have had at least 2 full days (consecutively or otherwise) off-duty in the 14 consecutive days before the projected end time of the assigned FDP.

5.4 For subclause 5.3, a ***full day*** means the period between 2 consecutive midnights.

6 Limit on cumulative flight time

The cumulative flight time accrued by an FCM during any consecutive 28-day period must not exceed 50 hours.

7 Limit on cumulative duty time

7.1 The cumulative duty accrued by an FCM during any consecutive 168-hour period must not exceed 45 hours.

7.2 The cumulative duty accrued by an FCM during any consecutive 336-hour period must not exceed 84 hours.

Note 168 hours is the number of hours in a 7-day period, and 336 hours is the number of hours in a 14-day period.

APPENDIX 4B MEDICAL TRANSPORT OPERATIONS AND EMERGENCY SERVICE OPERATIONS

1 FDP and flight time limits

1.1 An FCM must not be assigned an FDP longer than the number of hours specified in Table 1.1 in this clause (the ***FDP limit***), as determined by the local time at the start of the FDP and, for a multi-pilot operation, the number of sectors to be flown.

Table 1.1 Maximum FDP (in hours) for an FCM according to local time at the start of the FDP

Local time at start of FDP	Maximum FDP		
	Single-pilot operation	Multi-pilot operation	
		1-2 sectors	3+ sectors
0500 – 0559	11	12	12
0600 – 0659	11.5	13	12.5
0700 – 1159	12	14	13
1200 – 1459	11	13	12
1500 – 1559	10.5	12	11.5
1600 – 0459	10	11	11

FDP limit may be increased twice per 168-hour period

1.2 Despite subclause 1.1, the FDP limit for an FCM may be increased to not more than the following limits (an ***increased FDP***) provided the conditions in subclause 1.3 are complied with:

(a) for a single-pilot operation — 12 hours;

(b) for any multi-pilot operation — 14 hours.

1.3 For subclause 1.2:

(a) there must be no more than 2 increased FDPs in any 168 consecutive hour period; and

(b) the off-duty period before commencing an increased FDP must be not less than 12 hours; and

(c) an increased FDP must be followed by an off-duty period of not less than 12 hours; and

(d) an increased FDP must not be further increased by a split-duty rest period under clause 2, but it may be extended under clause 3.

Note Clause 5 also requires that an FCM who conducts an increased FDP under this clause has an off-duty period of at least 36 hours, including 2 local nights, during the 168 consecutive hour period.

1.4 An FCM must not be assigned or commence flight time for flight training during an FDP unless the flight training is conducted during the first 7 hours of the FDP's flight time.

Note Subclause 1.4 does not apply to a flight review or a proficiency check because these are not flight training as defined in paragraph 6.1 of this CAO.

1.5 If, in the 8 hours immediately before an FDP (the ***8-hour period***), an FCM performed duties other than conducting a flight in an aircraft (***non-flying duties***) the maximum permissible duration of the FDP must be decreased by the greater of:

(a) 30 minutes; or

(b) the total duration of the non-flying duties performed during the 8-hour period.

1.6 An FCM must not exceed an FDP limit set out in the AOC holder's operations manual in accordance with this CAO.

2 Increase in FDP limits by split duty

2.1 Subject to subclauses 2.2 and 2.6, if an FDP contains a split-duty rest period of at least 2 consecutive hours with access to suitable sleeping accommodation, the FDP worked out under clause 1 may be increased by the duration of the split-duty rest period.

2.2 For subclause 2.1, the remaining length of the FDP resumed at the time the split-duty rest period ends (the ***resumption time***) must not be greater than the FDP limit that would apply under Table 1.1 to an FCM who commenced a new FDP at the resumption time.

2.3 After an FDP mentioned in subclause 2.1, the duration of the split-duty rest period may be reduced by 50% in determining the subsequent off-duty period under subclause 5.1 or cumulative duty time under clause 7.

2.4 Subject to subclause 2.6, if an FDP contains 1 or 2 split-duty rest periods, each of at least 2 consecutive hours with access to suitable resting accommodation, the maximum FDP worked out under clause 1 may be increased by half the duration of the split-duty rest period or periods up to a total of 2 hours.

2.5 The requirements of subclause 5.1 are taken to be met if an FDP contains a split-duty rest period with access to suitable sleeping accommodation, and the split-duty rest period is:

(a) of at least 10 consecutive hours, plus the number of hours difference in local time between the location where the FDP commenced and the location where the split-duty rest period is undertaken; and

(b) undertaken over a local night.

2.6 An FDP that includes a split-duty rest period must not exceed 16 hours.

Note For any particular FCM, other provisions of this CAO may have the effect of reducing maximum FDP limits under this Appendix (see, for example, subsections 14 and 15 of this CAO).

3 Extensions

3.1 Subject to subclause 3.3, in unforeseen operational circumstances, at the discretion of the FCM, an FDP may be extended, by up to a maximum of 2 hours for a multi-pilot operation, or 1 hour for a single-pilot operation, beyond:

(a) the FDP limit specified in Table 1.1 (including that limit as increased under subclause 1.2); or

(b) the FDP limit specified in Table 1.1 as increased by a split-duty rest period under clause 2, provided the extended FDP does not exceed 16 hours.

3.2 Subject to subclause 3.3, if:

(a) an AOC holder has urgent operations procedures in the operations manual; and

(b) an operation is deemed to be urgent in accordance with the manual;

then at the discretion of the FCM, an FDP containing an urgent operation may be extended by up to a maximum of 4 hours beyond:

(c) the FDP limit specified in Table 1.1 (including that limit as increased under subclause 1.2), provided the extended FDP does not exceed 16 hours; or

(d) the FDP limit specified in Table 1.1 as increased by a split-duty rest period under clause 2, provided the extended FDP does not exceed 16 hours.

3.3 Before exercising the discretion under subclause 3.1 or 3.2 to extend the FDP limit of an FCM, the pilot in command of a multi-pilot operation must:

(a) do the following:

(i) consult each FCM who is a crew member on the aircraft;

(ii) be satisfied that each FCM considers himself or herself fit for the extension;

(b) if the FCM whose FDP would be extended is the pilot in command — do the following:

(i) consult each FCM who is a crew member on the aircraft;

(ii) be satisfied that, as pilot in command, he or she is fit for the extension.

Note Due to the nature of medical transport operations and emergency service operations, for urgent operations extensions may be permitted in operational circumstances where the operator and the flight crew are satisfied the safety of the flight will not be impacted by fatigue.

3.4 Despite the limits provided in the operations manual, the flight time limit for an FDP may be extended by not more than 30 minutes if:

(a) it is operationally necessary in order to complete the duty; and

(b) the FCM, or each FCM, considers himself or herself fit for the extension.

3.5 Flight training for up to 30 minutes may be conducted after the first 7 hours of the FDP's flight time if:

(a) unforeseen operational circumstances arise after the commencement of the FDP; and

(b) it is operationally necessary in order to complete the duty; and

(c) the FCM considers himself or herself fit for the extension.

3.6 An FDP limit must not be extended under this clause if it would cause an FCM to exceed the cumulative flight time limits in clause 7.

3.7 Despite any limit or number under this Appendix, if:

(a) unforeseen operational circumstances arise after take-off on the final sector of an FDP; and

(b) the unforeseen operational circumstances would cause an FCM to exceed any limit or number permitted under this Appendix;

then the flight may continue to the planned destination or alternate at the discretion of the pilot in command.

Note 1 Under regulation 91.215 of CASR, the pilot in command of an aircraft is responsible for the conduct and safety of members of the crew on the aircraft and, therefore, has a discretion to not permit an extension to occur even if otherwise permissible under this clause.

Note 2 Guidance on the assessment of individual cognitive and physical fitness is contained in CAAP 48-01.

4 Standby

4.1 An FCM may be placed on standby.

4.2 If an FCM is called out from standby to commence an FDP (which may include a split-duty rest period), the FDP must be followed by an off-duty period in accordance with clause 5.

4.3 If an FCM is called out to commence duties other than flying duties, the FCM may return to standby following that duty period. However, subclause 1.6 applies to a subsequent FDP.

5 Off-duty period limits

Off-duty period following an FDP

5.1 Immediately after an FDP, an FCM must have an off-duty period of at least the following consecutive hours, during which there must be access to suitable sleeping accommodation for at least 8 consecutive hours:

(a) if the off-duty period includes the period between 2300 and 0559 hours local time — the sum of:

(i) 8 hours; and

(ii) the amount of time that the FDP exceeds 12 hours (provided the excess is not due to an extension mentioned in subparagraph (iv)); and

(iii) the amount of displacement time of the FDP; and

(iv) 1 hour for every 30 minutes, or part of 30 minutes, that the FDP was extended beyond the FDP limit;

(b) if the off-duty period does not include the period between 2300 and 0559 hours local time — the sum of:

(i) 10 hours; and

(ii) the amount of time that the FDP exceeds 12 hours (provided the excess is not due to an extension mentioned in subparagraph (iv)); and

(iii) the amount of displacement time of the FDP; and

(iv) 1 hour for every 30 minutes, or part of 30 minutes, that the FDP was extended beyond the FDP limit.

Reduction in off-duty period

5.2 If an off-duty period calculated under subclause 5.1 is greater than 12 hours, the off-duty period may be reduced to not less than 12 hours provided that:

(a) the next FDP is conducted under this Appendix; and

(b) the off-duty period following the next FDP is at least 24 hours.

Off-duty periods for cumulative fatigue recovery

5.3 If, in any consecutive 168-hour period (the ***period***), an FCM conducts either:

(a) 3 or more FDPs, each of which involves a late-night operation; or

(b) an increased FDP in accordance with subclause 1.2;

then the FCM must have an off-duty period of at least 36 consecutive hours, including 2 local nights during the period.

5.4 Before beginning an FDP or standby, an FCM must have had at least 1 of the following:

(a) in any consecutive 336-hour period before the projected end of the assigned FDP or standby — 1 off-duty period of at least 36 consecutive hours, including 2 local nights;

(b) in any consecutive 504-hour period before the projected end of the assigned FDP or assigned standby — 1 off-duty period of at least 72 consecutive hours, including 3 local nights.

Note 336 hours is the number of hours in a 14-day period, and 504 hours is the number of hours in a 21-day period.

6 Limit on cumulative flight time

6.1 The cumulative flight time accrued by an FCM during any consecutive 28-day period must not exceed 100 hours.

6.2 The cumulative flight time accrued by an FCM during any consecutive 365-day period must not exceed 1 000 hours.

7 Limit on cumulative duty time

7.1 The cumulative duty time accrued by an FCM during any consecutive 168-hour period (the ***period***) must not exceed:

(a) if an FCM has not had at least 1 off-duty period of at least 36 hours, including 2 local nights during the period — 40 hours; and

(b) if an FCM has had at least 1 off-duty period of at least 36 hours, including 2 local nights during the period — 60 hours.

Note 168 hours is the number of hours in a 7-day period and 336 hours is the number of hours in a 14-day period.

7.2 The cumulative duty accrued by an FCM during any consecutive 336-hour period must not exceed 100 hours.

8 Limit on late-night operations

8.1 In any period of 168 consecutive hours, an FCM must not be assigned, or conduct, more than 4 FDPs involving late-night operations.

8.2 If in any period of 168 consecutive hours (the ***period***) an FCM conducts 3 or more FDPs involving late-night operations, the FCM is limited to 40 hours cumulative duty time during the period.

Note See also subclause 5.3 which requires that an FCM must have an off-duty period of at least 36 consecutive hours, including 2 local nights if 3 or more late-night operations are conducted during any 168 consecutive hour period.

9 Maximum durations must not be exceeded

Unless an extension is permitted under clause 3, in performing duty an FCM must not exceed the following:

(a) the maximum duration of the FDP specified for the FCM in the AOC holder's operations manual;

(b) the maximum flight time specified for the FCM in the AOC holder's operations manual.

APPENDIX 5 AERIAL WORK OPERATIONS AND FLIGHT TRAINING ASSOCIATED WITH AERIAL WORK

1 FDP limits

1.1 An FCM must not be assigned an FDP longer than the number of hours specified in Table 1.1 in this clause, as determined by:

(a) the local time at the start of the FDP; and

(b) whether the operation is a single-pilot operation or a multi-pilot operation; and

(c) for a multi-pilot operation — whether the number of sectors is 1 or 2, or 3 or more.

Note Aerial work operations captured by this Appendix are widely varied. Therefore, operators are reminded to limit FDP in accordance with their operator obligations, and include FDP limits in their operations manual.

1.2 An FCM must not be assigned or commence flight time for flight training during an FDP unless the flight training is conducted during the first 7 hours of the FDP's flight time.

Table 1.1 Maximum FDP (in hours) for an FCM according to local time at the start of the FDP

Local time at start of FDP	Maximum FDP (hours)		
	Single-pilot operation	Multi-pilot operation	
		For 1 or 2 sectors	For 3 or more sectors
0500 – 0559	11	12	12
0600 – 0659	11.5	13	12.5
0700 – 1159	12	14	13
1200 – 1459	11	13	12
1500 – 1559	10.5	12	11.5
1600 – 0459	10	11	11

FDP limit may be increased twice per 168-hour period

1.3 Despite subclause 1.1, the FDP limit for an FCM may be increased to not more than the following limits (an ***increased FDP***) provided the conditions in subclause 1.4 are complied with:

(a) for a single-pilot operation — 12 hours;

(b) for any multi-pilot operation — 14 hours.

1.4 For subclause 1.3:

(a) there must be no more than 2 increased FDPs in any 168 consecutive hour period; and

(b) the off-duty period before commencing an increased FDP must be not less than 12 hours; and

(c) an increased FDP must be followed by an off-duty period of not less than 12 hours; and

(d) an increased FDP must not be further increased by a split-duty rest period under clause 2, but it may be extended under clause 3.

Note Clause 5 also requires that an FCM who conducts an increased FDP under this clause has an off-duty period of at least 36 hours, including 2 local nights, during the 168 consecutive hour period.

1.5 If, in the 8 hours immediately before an FDP (the ***8-hour period***), an FCM performed duties other than conducting a flight in an aircraft (***non-flying duties***) the maximum permissible duration of the FDP must be decreased by the greater of:

(a) 30 minutes; or

(b) the total duration of the non-flying duties performed during the 8-hour period.

1.6 In any 168 consecutive hours, an FCM must not be assigned, or conduct, more than 4 FDPs which include any time between midnight and 0459 local time.

1.7 An FCM must not exceed an FDP limit set out in the AOC holder's operations manual in accordance with this CAO.

2 Increase in FDP limits by split duty

2.1 If an FDP contains a split-duty rest period of at least 3 consecutive hours at suitable sleeping accommodation, the maximum FDP worked out under clause 1 may be increased by the duration of the split-duty rest period.

2.2 Where an FDP contains a split-duty rest period of at least 2 consecutive hours with access to suitable resting accommodation, the maximum FDP worked out under subclause 1.1 may be increased by half the duration of the split-duty rest period, provided the increase is not more than 2 hours.

2.3 Any portion of an FDP remaining after a split-duty rest period must be no longer than the sum of 6 hours and any permitted extension under clause 3.

Note These are the maximum FDP limits under this Appendix unless, for any particular FCM, other provisions have the effect of reducing these limits (for example, subsections 14 and 15 of this CAO).

3 Extensions

3.1 Subject to subclause 3.2, at the discretion of the FCM, an FDP may be extended by up to a maximum of 2 hours beyond:

(a) the FDP limit specified in Table 1.1, including that limit as increased under subclause 1.3; or

(b) the FDP limit specified in Table 1.1 only, as increased by a split-duty rest period under clause 2.

Note Due to the nature of aerial work operations, extensions are permitted in operational circumstances where the FCM is satisfied that the safety of the flight will not be impacted by fatigue.

3.2 Before deciding to extend an FDP under subclause 3.1, the pilot in command of a multi-pilot operation must:

(a) do the following:

(i) consult each FCM who is a crew member on the aircraft;

(ii) be satisfied that each FCM considers himself or herself fit for the extension; and

(b) if the FCM whose FDP would be extended is the pilot in command — do the following:

(i) consult each FCM who is a crew member on the aircraft;

(ii) be satisfied that, as pilot in command, he or she is fit for the extension.

3.3 Flight training for up to 30 minutes may be conducted after the first 7 hours of the FDP's flight time if:

(a) unforeseen operational circumstances arise after the commencement of the FDP; and

(b) it is operationally necessary in order to complete the duty; and

(c) the FCM considers himself or herself fit for the extension.

3.4 Subject to subclause 3.5, any extension over the FDP limit requires the off-duty period required by subclause 5.1 to be increased by 1 hour for every 30 minutes, or part of 30 minutes, that the FDP is extended beyond the FDP limit.

3.5 If an off-duty period calculated under subclause 3.2 is greater than 12 hours, the off-duty period may be reduced to not less than 12 hours provided that:

(a) the next FDP is conducted under this Appendix; and

(b) the off-duty period following the next FDP is at least 36 hours, including 2 local nights.

3.6 An FDP limit must not be extended under this clause if it would cause an FCM to exceed the cumulative flight time limits in clause 6.

3.7 Despite any limit or number under this Appendix, if:

(a) unforeseen operational circumstances arise after take-off on the final sector of an FDP; and

(b) the unforeseen operational circumstances would cause an FCM to exceed any limit or number permitted under this Appendix;

then the flight may continue to the planned destination or alternate at the discretion of the pilot in command.

Note 1 Under regulation 91.215 of CASR, the pilot in command of an aircraft is responsible for the conduct and safety of members of the crew on the aircraft and, therefore, has a discretion to not permit an extension to occur even if otherwise permissible under this clause.

Note 2 Guidance on the assessment of individual cognitive and physical fitness is contained in CAAP 48-01.

4 Standby

4.1 An FCM may be placed on standby.

4.2 If an FCM is called out from standby to commence an FDP (which may include a split-duty rest period), the FDP must be followed by an off-duty period in accordance with clause 5.

4.3 If an FCM is called out to commence duties other than flying duties, the FCM may return to standby following that duty period. However, subclause 1.5 applies to a subsequent FDP.

5 Off-duty period limits

Off-duty period following an FDP

5.1 Immediately after an FDP, an FCM must have an off-duty period of at least the following number of consecutive hours, during which there must be access to suitable sleeping accommodation for at least 8 consecutive hours:

(a) if the off-duty period includes the period between 2300 and 0559 hours local time — 8;

(b) if the off-duty period does not include the period between 2300 and 0559 hours local time — 10.

Note Under subclause 3.2 of this Appendix the off-duty period is increased by 1 hour for every 30 minutes, or part of 30 minutes, that the FDP is extended beyond the FDP limit.

Off-duty periods for cumulative fatigue recovery

5.2 Before beginning an FDP or standby, an FCM must have had at least 1 of the following:

(a) in any consecutive 336-hour period before the projected end of the assigned FDP or standby — 1 off-duty period of at least 36 consecutive hours, including 2 local nights;

(b) in any consecutive 504-hour period before the projected end of the assigned FDP or assigned standby — 1 off-duty period of at least 72 consecutive hours, including 3 local nights.

Note 336 hours is the number of hours in a 14-day period, and 504 hours is the number of hours in a 21-day period.

5.3 If, in any consecutive 168-hour period (the ***period***), an FCM conducts 1 or 2 increased FDPs in accordance with subclause 1.3, the FCM must have an off-duty period of at least 36 consecutive hours, including 2 local nights during the period.

6 Limit on cumulative flight time

6.1 The cumulative flight time accrued by an FCM during any consecutive 168-hour period must not exceed 50 hours.

6.2 Subject to subclause 6.4, the cumulative flight time accrued by an FCM during any consecutive 28-day period must not exceed 170 hours.

6.3 Subject to subclause 6.4, the cumulative flight time accrued by an FCM during any consecutive 90-day period must not exceed 450 hours.

6.4 The cumulative flight time limits in subclauses 6.2 and 6.3 may be reset to zero immediately after the FCM is provided with at least 5 consecutive days off-duty.

6.5 Subject to subclause 6.6, the cumulative flight time accrued by an FCM during any consecutive 365-day period must not exceed 1 200 hours.

6.6 The cumulative flight time limit in subclause 6.5 may be reset to zero if the FCM is provided with at least 28 consecutive days off-duty.

Note These cumulative flight time limits are designed to mitigate the effects of cumulative fatigue. AOC holders are reminded, first, of the emotional, cognitive and physical effects of workload on the performance of FCMs in addition to fatigue and, secondly, that these limits are for optimal circumstances and may not be achievable due to hazard identification and other procedures required under subsection 15 of this CAO.

7 Maximum durations must not be exceeded

Unless an extension is permitted under clause 3, in performing duty an FCM must not exceed the following:

(a) the maximum duration of the FDP specified for the FCM in the AOC holder's operations manual;

(b) the maximum flight time specified for the FCM in the AOC holder's operations manual.

APPENDIX 5A DAYLIGHT AERIAL WORK OPERATIONS AND FLIGHT TRAINING ASSOCIATED WITH AERIAL WORK

1 Sleep opportunity before an FDP

An FCM must not be assigned or commence an FDP at a location unless he or she:

(a) has had at least 8 consecutive hours' sleep opportunity within the 10 hours immediately before commencing the FDP; and

(b) on each of the 3 local nights immediately before commencing the FDP, has not carried out any duties during the 8 hours prior to 30 minutes before morning civil twilight at the location.

Note The intent of paragraph (b) is to prohibit an FCM from undertaking an FDP under Appendix 5A if they have undertaken any duties on the 3 nights immediately before the FDP.

2 FDP and flight time limits

2.1 An FCM must not be assigned or commence an FDP that:

(a) begins more than 30 minutes before the beginning of morning civil twilight at the location at which the FDP commences; or

(b) ends later than the end of evening civil twilight at the location at which the FDP commences.

Note This subclause does not affect other legislative requirements that limit Day VFR operations.

2.2 An FCM may only be assigned an FDP with a total duration no longer than 14 hours in any 1 day (the ***FDP limit***).

2.3 An FCM must not be assigned or commence flight time for flight training during an FDP unless the flight training is conducted during the first 7 hours of the FDP's flight time.

Note Subclause 2.3 does not apply to a flight review or a proficiency check because these are not flight training as defined in paragraph 6.1 of this CAO.

3 Extensions

3.1 Subject to subclause 3.2, at the discretion of the FCM, an FDP may be extended up to a maximum of 1 hour beyond the FDP limit in subclause 2.2, provided the FCM considers himself or herself fit for the extension.

3.2 An FDP must not be extended beyond the end of evening civil twilight, unless this is necessary to complete the duties associated with the last daylight flight.

3.3 Flight training for up to 30 minutes may be conducted after the first 7 hours of the FDP's flight time if:

(a) unforeseen operational circumstances arise after the commencement of the FDP; and

(b) it is operationally necessary in order to complete the duty; and

(c) the FCM considers himself or herself fit for the extension.

4 Off-duty period limits

4.1 Following an FDP, an FCM must have an off-duty period of at least 10 consecutive hours.

4.2 An FCM must, in any consecutive 384-hour period, have a period of at least 2 consecutive days off-duty.

Note 384 hours is the number of hours in a 16-day period.

5 Limit on cumulative flight time

5.1 The cumulative flight time accrued by an FCM during any consecutive 384-hour period must not exceed 100 hours.

5.2 If the operation is a mustering operation, the cumulative flight time accrued by the FCM during any consecutive 30-day period must not exceed 120 hours if the combined total of his or her flying time in mustering operations as pilot in command and pilot in command under supervision is less than 500 hours.

5.3 The cumulative flight time limits in subclauses 5.1 and 5.2 may be reset to zero immediately after the FCM is provided with at least 5 consecutive days off-duty.

5.4 The cumulative flight time accrued by an FCM during any consecutive 365-day period must not exceed 1 200 hours.

5.5 The cumulative flight time limit in subclause 5.4 may be reset to zero immediately after the FCM is provided with at least 28 consecutive days off-duty.

Note 1 384 hours is the number of hours in a 16-day period.

Note 2 These cumulative flight time limits are designed to mitigate the effects of cumulative fatigue. AOC holders are reminded, first, of the emotional, cognitive and physical effects of workload on the performance of FCMs in addition to fatigue and, secondly, that these limits are for optimal circumstances and may not be achievable due to hazard identification and other procedures required under subsection 15 of this CAO.

6 Maximum durations must not be exceeded

Unless an extension is permitted under clause 3, in performing duty an FCM must not exceed the following:

(a) the maximum duration of the FDP specified for the FCM in the AOC holder's operations manual;

(b) the maximum flight time specified for the FCM in the AOC holder's operations manual.

APPENDIX 6 FLIGHT TRAINING

Note Appendix 6 does not apply to flight training in a flight simulation training device.

1 Sleep opportunity before an FDP or standby

An FCM must not be assigned or commence an FDP or standby unless he or she has at least 8 consecutive hours' sleep opportunity within the 12 hours immediately before commencing the FDP or standby.

Note See subsection 6 of this CAO for the definition of ***sleep opportunity***, where it is defined as occurring during an off-duty period.

2 FDP and flight time limits

2.1 An FCM must not be assigned an FDP longer than the number of hours specified in Table 2.1 in this clause (the ***FDP limit***), as determined by the local time at the start of the FDP.

2.2 For any FDP, an FCM must not be assigned flight time longer than 7 hours.

2.3 In applying Table 2.1, first, choose the appropriate local time at which the FDP for the FCM is to start. The maximum FDP for the FCM is the number that corresponds to the chosen local time at which the FDP for the FCM is to start.

Table 2.1 Maximum FDP (in hours) according to local time at start of FDP

Local time at start of FDP	Maximum FDP
0500 – 0559	9
0600 – 0659	10
0700 – 0759	10
0800 – 1059	11
1100 – 1359	10
1400 – 2259	9
2300 – 0459	8

3 Increase in FDP limits by split duty

3.1 Subject to subclause 3.4, if an FDP contains a split-duty rest period of at least 4 consecutive hours with access to suitable sleeping accommodation, the maximum FDP worked out under clause 2 may be increased by up to 4 hours.

3.2 After an FDP mentioned in subclause 3.1, the first 4 hours of the split-duty rest period may be reduced by 2 hours for the purpose of determining the subsequent off-duty period or cumulative duty time under clause 7 or 9 of this Appendix.

3.3 Subject to subclause 3.4, where an FDP contains a split-duty rest period of at least 2 consecutive hours with access to suitable resting accommodation, the FDP limits under subclause 2.1 may be increased by half the duration of the split-duty rest period, provided the increase is not more than 2 hours.

3.4 If a split-duty rest period includes any period between the hours of 2300 to 0529 local time, then:

(a) the split-duty rest period must be for a consecutive period of at least 7 hours with access to suitable sleeping accommodation; and

(b) the maximum FDP may be increased to 15 hours (if not already permitted); and

(c) the reduction in the subsequent off-duty period and cumulative duty time, provided for in subclause 3.2, does not apply.

3.5 Unless the FDP is extended under clause 4, any portion of an FDP remaining after a split-duty rest period must be no longer than 5 hours.

Note These are the maximum FDP and flight time limits under this Appendix unless, for any particular FCM, other provisions have the effect of reducing these limits (for example, subsections 14 and 15 of this CAO).

4 Reassignment and extension

4.1 After an FCM's assigned FDP commences, the AOC holder may reassign to the FCM a modified FDP (a ***reassignment***), provided that each of the following applies:

(a) subject to subclauses 4.3 and 4.5 — the modified FDP and flight time does not exceed the applicable limits in the holder's operations manual;

(b) the FCM has confirmed that he or she is fit for the reassignment.

Note Fitness in this context is based on the FCM's self-assessment. An FCM has an obligation under paragraph 16.1 of this CAO not to carry out any task for a flight if, due to fatigue, the FCM is, or is likely to become, unfit for the task. If such circumstances apply, the FCM must decline the reassignment.

4.2 If subclause 4.1 applies, the FCM may continue in the modified FDP in accordance with subclause 4.1.

4.3 Despite the FDP limits provided in the operations manual, in unforeseen operational circumstances at the discretion of the pilot in command, the FDP limits in the operations manual may be extended by up to 1 hour.

4.4 Before exercising the discretion under subclause 4.3 to extend an FDP limit in the operations manual, the pilot in command must be satisfied that he or she, and any other FCM, are fit for the extension.

4.5 Despite the limits provided in the operations manual, the flight time limit for an FDP may be extended by not more than 30 minutes if:

(a) unforeseen operational circumstances arise after the commencement of the FDP; and

(b) it is operationally necessary in order to complete the duty; and

(c) the FCM considers himself or herself fit for the extension.

4.6 An FDP limit must not be reassigned or extended under this clause if it would cause an FCM to exceed the cumulative flight time limits in clause 8 or the cumulative duty time limits in clause 9.

4.7 Despite any limit or number under this Appendix, if:

(a) unforeseen operational circumstances arise after take-off on the final sector of an FDP; and

(b) the unforeseen operational circumstances would cause an FCM to exceed any limit or number permitted under this Appendix;

then the flight may continue to the planned destination or alternate at the discretion of the pilot in command.

Note 1 Under regulation 91.215 of CASR, the pilot in command of an aircraft is responsible for the conduct and safety of members of the crew on the aircraft and, therefore, has a discretion to not permit an extension to occur even if otherwise permissible under this clause.

Note 2 Guidance on the assessment of individual cognitive and physical fitness is contained in CAAP 48-01.

5 Standby limits and standby-like arrangements

5.1 An AOC holder must not require an FCM to be on continuous standby for a period longer than 14 hours.

5.2 The maximum allowable FDP after a call out from standby must be decreased by the number of hours by which the standby exceeds 4 hours.

5.3 A standby which is completed without a call out must be followed by an off-duty period of at least 10 consecutive hours.

5.4 To remove any doubt, the period of time in which an FCM is held in a standby-like arrangement must be treated as a duty period for the purposes of this CAO.

Note For example, the period spent in a standby-like arrangement must be included as part of a following FDP assigned to the FCM or added to the preceding FDP when determining minimum off-duty periods under clause 7.

6 Positioning

On completion of assigned flight duties in an FDP (the ***relevant FDP***), an FCM may position to a suitable location as required by the AOC holder.

Note As with any duty, the time spent in positioning after completion of the FDP must be added to the relevant FDP when determining minimum off-duty periods under clause 7.

7 Off-duty periods

Off-duty period following an FDP

7.1 After an FCM's FDP and any duty time after completion of the FDP but before commencement of the following off-duty period (***other duty time***), his or her following off-duty period must be at least the sum of:

(a) 12 hours; and

(b) 1.5 times the time that the FDP and the other duty time exceeded 12 hours.

Off-duty periods for cumulative fatigue recovery

7.2 Before beginning any standby time or FDP, an FCM must have had at least 36 consecutive hours off-duty, including 2 local nights, in the 168 hours before the projected end time of the assigned FDP or assigned standby.

7.3 Before beginning any standby time or FDP, an FCM must have had at least 6 days off-duty in the 28 consecutive days before the standby or FDP commences.

8 Limit on cumulative flight time

8.1 The cumulative flight time accrued by an FCM during any consecutive 28-day period must not exceed 100 hours.

8.2 The cumulative flight time accrued by an FCM during any consecutive 365-day period must not exceed 1 000 hours.

9 Limit on cumulative duty time

9.1 The cumulative duty accrued by an FCM during any consecutive 168-hour period must not exceed 60 hours.

9.2 The cumulative duty accrued by an FCM during any consecutive 336-hour period must not exceed 100 hours.

Note 168 hours is the number of hours in a 7-day period, and 336 hours is the number of hours in a 14-day period.

10 Limits on infringing the WOCL and early starts

10.1 Subject to subclause 10.3, an FCM must not be assigned more than 3 consecutive early starts.

10.2 Subject to subclause 10.3, an FCM, whose duties have already infringed 3 consecutive WOCLs, must not be assigned an FDP that would again infringe the WOCL without at least an intervening off-duty period that includes a local night.

Note See paragraph 6.2 of this CAO for duties that infringe a WOCL.

10.3 Despite subclauses 10.1 and 10.2, the FCM may have a 4th, or a 4th and a 5th, consecutive early start (whether or not the start infringes the WOCL) if:

(a) the maximum FDP permissible on the day of the 4th early start is reduced by 2 hours; and

(b) the maximum FDP permissible on the day of the 5th early start is reduced by 4 hours.

11 Maximum durations must not be exceeded

Unless an extension is permitted under clause 4, in performing duty an FCM must not exceed the following:

(a) the maximum duration of the FDP specified for the FCM in the AOC holder's operations manual;

(b) the maximum flight time specified for the FCM in the AOC holder's operations manual.

APPENDIX 7 FATIGUE RISK MANAGEMENT SYSTEM (FRMS)

1 General

1.1 An AOC holder may apply to CASA for:

(a) a trial FRMS implementation approval, for all or part of its operations; or

(b) a full FRMS implementation approval, for all or part of its operations.

Note An AOC holder is not eligible for a full implementation approval until the FRMS has been in effective operation for at least 12 months from the date of a trial implementation approval. See clause 9.

1.2 For a trial or full FRMS implementation approval, an FRMS must include CASA approval of each of the following elements of the FRMS:

(a) the policy and objectives, and related documentation, in accordance with clause 2;

(b) the practical operating procedures in accordance with clause 3;

(c) the hazard identification, risk assessment and mitigation procedures in accordance with clause 4;

(d) the safety assurance procedures in accordance with clause 5;

(e) the safety promotion procedures in accordance with clause 6;

(f) the change management procedures in accordance with clause 7.

Note 1 Significant changes require CASA approval. See clause 7.

Note 2 Guidance for the development and implementation of an FRMS is available on the ICAO and CASA websites.

1.3 If the AOC holder has an SMS, a trial or full FRMS implementation approval will not be given unless CASA is satisfied that the FRMS is integrated with the SMS.

1.4 Before CASA issues a trial FRMS implementation approval, CASA must be satisfied that the AOC holder's FRMS:

(a) comprises all of the elements mentioned in subclause 1.2; and

(b) is a safe, integrated, data-driven, system which appears to be reasonably capable of continuously and effectively monitoring and managing fatigue-related safety risks using scientific principles and knowledge, and operational experience; and

(c) will enable the AOC holder to assess the extent to which FCMs and other relevant personnel perform at levels of alertness sufficient to ensure the safety of operations.

1.5 Before CASA issues a full FRMS implementation approval, CASA must be satisfied that the AOC holder's FRMS:

(a) comprises all the elements mentioned in subclause 1.2; and

(b) is a safe, integrated, data-driven, system which will continuously and effectively monitor and manage fatigue-related safety risks using scientific principles and knowledge, and operational experience; and

(c) will enable the AOC holder to ensure that FCMs and other relevant personnel perform at levels of alertness sufficient to ensure the safety of operations.

2 FRMS policy and documentation

2.1 The AOC holder must have an FRMS policy:

(a) referring to all elements of the FRMS mentioned in subclause 1.2; and

(b) if the AOC holder has an SMS — which integrates the FRMS with the SMS.

2.2 The policy must require that all operations to which the FRMS applies be clearly defined in the operations manual.

2.3 The policy must:

(a) make it clear that while primary responsibility for the FRMS lies with the AOC holder, its effective implementation requires shared responsibility by management, FCMs, and other relevant personnel; and

(b) clearly indicate the safety objectives of the FRMS; and

(c) be approved in writing by the Chief Executive Officer; and

(d) be accessible to all relevant areas and levels of the organisation in a way that indicates the AOC holder's specific endorsement of the policy; and

(e) declare management commitment to:

(i) effective safety reporting; and

(ii) provision of adequate resources for the FRMS; and

(iii) continuous improvement of the FRMS; and

(f) require that clear lines of accountability are identified for management, FCMs, and all other relevant personnel; and

(g) require periodic reviews to ensure the policy remains relevant and appropriate.

2.4 The policy must:

(a) be in a written statement; and

(b) require that each other element of the FRMS mentioned in subclause 1.2 be described in a written statement.

2.5 In addition to the requirements under subclause 2.4, and the relevant limits and procedures contained in the operations manual in accordance with this CAO, the FRMS must also be supported by the following documentation, namely, up-to-date identification, description and records of the following:

(a) the personnel accountabilities, responsibilities and authorities for effective implementation of the FRMS, including the FRMS Manager;

(b) the mechanisms for ongoing involvement in fatigue risk management of management, FCMs, and all other relevant personnel;

(c) the FRMS training programs, training requirements and records of attendance at training;

(d) scheduled and actual flight times, and duty periods and off-duty periods with significant deviations and reasons for deviations noted;

(e) the FRMS outputs, including findings from collected data, and recommendations and actions taken.

2.6 An AOC holder's exposition or operations manual (as the case requires) must contain the details of the FRMS.

Note 1 See also paragraph 6.4 in subsection 6 in relation to references to expositions and operations manuals.

Note 2 The FRMS may be subject to CASA directions under regulation 11.245 of CASR in the interests of aviation safety — see subclause 7.4 of this Appendix.

3 FRMS practical operating procedures

3.1 The FRMS practical operating procedures must, as a minimum:

(a) incorporate scientific principles and knowledge; and

(b) identify, on an ongoing basis, fatigue-related safety hazards and the risks that result from them; and

(c) ensure that remedial actions necessary to effectively mitigate the risks associated with the hazards are implemented properly; and

(d) provide for continuous recording and monitoring of, and regular assessment of:

(i) fatigue-related safety hazards; and

(ii) relevant remedial actions; and

(iii) the extent to which mitigation of fatigue-related risks is achieved by remedial actions; and

(e) provide for continuous improvement in the effectiveness of the FRMS.

3.2 The FRMS practical operating procedures must set out:

(a) maximum values for each FCM for the following:

(i) flight times;

(ii) flight duty periods;

(iii) duty periods; and

(b) minimum values for each FCM off-duty periods.

Note The terms ***flight time***, ***flight duty period***, ***duty period*** and ***off-duty period*** are defined in this CAO.

3.3 For subclause 3.2, the values for each FCM must be based on scientific principles and knowledge and subject to safety assurance processes.

3.4 Subject to subclause 3.5, where an AOC holder acquires data from an FRMS which indicates that the maximum and minimum values required under paragraphs 3.2 (a) and (b) are too high or too low, respectively, the AOC holder must amend the FRMS to ensure that these values are acceptable.

3.5 For subclause 3.4, an amendment may only be made in accordance with clause 7.

4 FRMS hazard identification, risk assessment and mitigation procedures

FRMS hazard identification procedures

4.1 FRMS hazard identification procedures must be based on the following processes for fatigue-related hazard identification:

(a) the predictive process;

(b) the proactive process;

(c) the reactive process.

4.2 The predictive process must be capable of identifying fatigue-related hazards by examining FCM scheduling and taking into account the following:

(a) factors known to affect sleep;

(b) factors known to affect fatigue;

(c) the effects of the factors mentioned in paragraphs (a) and (b) on FCM performance.

4.3 The proactive process must be capable of identifying fatigue-related hazards within current flight operations.

4.4 The reactive process must be capable of identifying the contribution of fatigue-related hazards to actual events that could have affected, or did affect,

safety, with a view to determining how the effects of fatigue on each event could have been minimised.

FRMS risk assessment procedures

4.5 FRMS risk assessment procedures must be capable of determining the following:

(a) the probability of events occurring or circumstances arising that create a fatigue-related hazard;

(b) the potential severity of fatigue-related hazards;

(c) when the safety risks associated with paragraph (a) or (b) require mitigation.

4.6 For subclause 4.5, the FRMS risk assessment procedures must ensure that identified fatigue-related hazards are examined in relation to the following:

(a) the relevant operational context and procedures in which the identified fatigue-related hazard arose;

(b) the probability of the fatigue-related hazard arising in those circumstances;

(c) the possible consequences of the fatigue-related hazard in those circumstances;

(d) the effectiveness of existing safety procedures and controls.

FRMS risk mitigation procedures

4.7 FRMS risk mitigation procedures for each fatigue-related hazards must be capable of:

(a) selecting appropriate mitigation strategies for the hazard; and

(b) implementing the selected mitigation strategies; and

(c) monitoring the implementation and effectiveness of the strategies.

5 FRMS safety assurance procedures

5.1 FRMS safety assurance procedures must provide for:

(a) continuous monitoring of the performance of the FRMS;

(b) the analysis of fatigue-related trends;

(c) measurements to validate the effectiveness of mitigation strategies.

5.2 FRMS safety assurance procedures must include a formal process for the management of changes to the FRMS arising from the following:

(a) identification of changes in the operational environment that may affect FRMS;

(b) identification of changes within the AOC holder's organisation that may affect FRMS.

5.3 The FRMS safety assurance procedures must include a formal process to assess:

(a) what impact a change mentioned in paragraph 5.2 (a) or (b) may have on the effective performance of the FRMS; and

(b) for such a change — what amendment, change or modification may be needed to the FRMS to ensure its continued effective performance.

5.4 FRMS safety assurance procedures must provide for the continuous improvement of the FRMS, by including the following:

(a) the elimination or modification of fatigue-related risk controls that:

(i) have had unintended negative consequences; or

(ii) are no longer required because of changes in the AOC holder's operational or organisational environment;

(b) routine evaluations of facilities, equipment, documentation and procedures to determine their implications for fatigue-related risk management and control;

(c) identification of emerging fatigue-related risks to allow the introduction of new procedures and procedures to mitigate such risks.

6 FRMS safety promotion procedures

6.1 FRMS safety promotion procedures for fatigue-related hazards must include training and communication programs capable of supporting and continuously improving all elements of the FRMS in the delivery of optimum safety levels.

6.2 For subclause 6.1, FRMS safety promotion procedures must include the following:

(a) training programs for management, FCMs, and all other relevant personnel to ensure competency levels commensurate with the role and responsibility of the person under the FRMS;

(b) an effective FRMS communication plan that:

(i) explains all elements of the FRMS to management, FCMs, and all other relevant personnel; and

(ii) describes the communication channels which they must use to gather, disseminate and apply FRMS-related information.

7 FRMS change management procedures

7.1 For this clause, a ***significant change*** means:

(a) any increase to the values required under paragraph 3.2 (a); and

(b) any decrease to the values required under paragraph 3.2 (b); and

(c) any other change to any element of the FRMS that does not maintain or improve, or is not likely to maintain or improve, aviation safety.

7.2 The FRMS change management procedures must:

(a) meet the requirements of this clause; and

(b) clearly indicate how the AOC holder will amend, change or modify any element of the FRMS consistently with the requirements of this clause.

7.3 The change management procedures set out in this clause apply to:

(a) an AOC holder with a trial FRMS implementation approval; and

(b) an AOC holder with a full FRMS implementation approval.

7.4 After issuing an FRMS implementation approval, CASA may, in writing, direct an AOC holder to amend, change or modify the FRMS (including practices and documents), and the AOC holder must comply within the time specified by CASA in the direction.

Note 1 A failure to comply may result in revocation of the FRMS implementation approval.

Note 2 CASA's power to direct changes to an FRMS is an emergency power for safety purposes only. It does not relieve any approval holder of their own obligation to improve the performance of their FRMS where this is safe and practicable.

7.5 The AOC holder must not make a significant change to any element of the FRMS unless an application to make the change is approved in writing by CASA.

7.6 An application for approval of a significant change must:

(a) be in writing; and

(b) set out the change; and

(c) be accompanied by a copy of the part of the AOC holder's FRMS documentation affected by the change, clearly identifying the change.

7.7 A change to the FRMS that is not a significant change must be:

(a) made in accordance with the FRMS change management procedures; and

(b) notified in writing to CASA within the following period after the change is made:

(i) 7 days;

(ii) either:

(A) if an AOC holder's approved SMS amendment process under Part 82 of the CAOs has a different CASA notification period for SMS amendments — the period specified in the process; or

(B) if an AOC holder's exposition change process under the Regulations has a different CASA notification period for non-significant changes — the period specified in the process.

8 Trial FRMS implementation approval

8.1 CASA may, on written application, issue an AOC holder with a trial FRMS implementation approval for up to 24 months, if CASA is satisfied that each element of the AOC holder's FRMS:

(a) complies with and meets the requirements, attributes and characteristics of an FRMS under this Appendix; and

(b) is capable of delivering:

(i) identified safety outcomes; and

(ii) fatigue-risk data and reports; and

(iii) continuous improvement in the delivery of safety outcomes.

8.2 If an approval was issued under subclause 8.1, CASA may, by issuing a new trial FRMS implementation approval, extend the duration of the approval:

(a) on the written application of the AOC holder; or

(b) on CASA's own initiative if CASA considers that aviation safety requires a longer trial FRMS implementation approval period before a full FRMS implementation approval.

Note More than 1 extension is possible if CASA considers it appropriate and trial FRMS implementation approval status could, therefore, be required to last longer than 24 months.

9 Full FRMS implementation approval

9.1 CASA may, on written application, issue an AOC holder with a full FRMS implementation approval, if the AOC holder:

(a) has held a trial FRMS implementation approval for at least 12 consecutive months; and

(b) satisfies CASA, through relevant data and reports, that the FRMS:

(i) is demonstrably delivering the safety outcomes expected when the trial FRMS implementation approval was given; and

(ii) is capable of delivering continuous improvement in the delivery of safety outcomes.

9.2 If, for this clause, CASA decides not to issue the AOC holder with a full FRMS implementation approval, the holder may apply again to CASA for a trial FRMS implementation approval and clauses 8 and 9 will apply according to their terms.

9.3 For paragraph 9.1 (a), a trial FRMS implementation approval is deemed to include such an approval issued under *Civil Aviation Order 48.1 Instrument 2013* as in force immediately before the commencement of this CAO.

10 Expiry, suspension, revocation, surrender of FRMS implementation approval

10.1 An FRMS implementation approval stops having effect if:

(a) it expires, or it is suspended or revoked in writing by CASA; or

(b) the AOC holder tells CASA in writing that the holder wants to surrender the approval.

10.2 If the approval is revoked or surrendered, the AOC holder must return the approval instrument to CASA within 14 days.

10.3 CASA may revoke or suspend an approval if:

(a) the AOC holder does not comply with the requirements of this CAO for implementation or use of an FRMS; or

(b) CASA considers that continued implementation or use of the FRMS would adversely affect aviation safety; or

(c) the AOC holder refuses CASA reasonable access to any information or records produced under or for the FRMS which CASA requests in writing for the purpose of assessing the effectiveness and safety of the FRMS; or

(d) for a revocation only — CASA wishes to reissue the approval in a varied form.

10.4 To avoid doubt, in this clause, reference to an ***FRMS implementation approval*** means a trial or full FRMS implementation approval, and includes the approval as varied by CASA.

Notes to Civil Aviation Order 48.1

Note 1

The Civil Aviation Order (in force under the *Civil Aviation Act 1988, Civil Aviation Regulations 1988* and *Civil Aviation Safety Regulations 1998*) as shown in this compilation comprises *Civil Aviation Order 48.1 Instrument 2019* amended as indicated in the Tables below.

Table of Orders

Year and number	Date of registration on FRL	Date of commencement	Application, saving or transitional provisions
CAO 48.1 Instrument 2019	15 August 2019 (F2019L01070)	2 September 2019 (*see* s. 2)	
CAO 48.1 Amdt. Instrument 2019 (No. 1)	18 November 2019 (F2019L01473)	18 November 2019 (*see* s. 2)	
CAO 48.1 Amdt. Instrument 2020 (No. 1)	26 June 2020 (F2020L00805)	26 June 2020 (*see* s. 2)	
CAO 48.1 Amdt. Instrument 2021 (No. 1)	25 November 2021 (F2021L01610)	2 December 2021 (*see* s. 2)	

Table of Amendments

ad. = added or inserted am. = amended rep. = repealed rs. = repealed and substituted

Provision affected	How affected
subs. 2	rep. *Legislation Act 2003*, s. 48D
subs. 3	rep. *Legislation Act 2003*, 48C
subs. 4	am. F2021L01610
subs. 5	am. F2019L01473, F2020L00805 rs. F2021L01610
subs. 5A	ad. F2019L01473
Sub. 5A.2	am. F2021L01610
subs. 5AB	ad. F2020L00805 rep. F2021L01610
subs. 6	am. F2020L00805, F2021L01610
subs. 10	am. F2021L01610
subs. 12	am. F2021L01610
subs. 16	am. F2021L01610
Appendix 1	am. F2021L01610
Appendix 2	am. F2021L01610
Appendix 3	am. F2021L01610
Appendix 4	am. F2021L01610
Appendix4A	am. F2021L01610
Appendix 4B	am. F2021L01610
Appendix 5	am. F2021L01610
Appendix 6	am. F2021L01610

Table of Amendments

ad. = added or inserted am. = amended rep. = repealed rs. = repealed and substituted

Provision affected	How affected
Appendix 7	am. F2021L01610